ISSN 2621-5799 (Online)
ISSN 2657-215X (Print)

Asian Institute of Research

Education Quarterly Reviews

Vol. 4, No.1 March 2021

Asian Institute of Research
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ASIAN INSTITUTE OF RESEARCH
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The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 1-11
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.168

New Students' Perceptions on the Implementation of Zoning-Based PPDB

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Abstract
This research aims to determine the perceptions of new students on the implementation of zoning-based PPDB (New Learner Admission Activities). The method in this research was mixed-method approach. Primary data was obtained through distributing questionnaires filled out by students. Samples were taken using purposive sampling technique in five cities, including Bandung, Surakarta, Surabaya, Pontianak and Serang. The data analysis technique used the Miles and Huberman model. The results show that the school which initially received the favourite label is still the favourite one because of the facilities and infrastructure and the implementation of the existing learning process in the school. The zoning system based on student perceptions does not reduce enthusiasm for learning. The zoning-based PPDB for junior high school and senior high school is more guaranteed for students who live close to the school to get the target school. The zoning system has been well implemented in four cities, including Surabaya, Bandung, Surakarta and Pontianak. In addition, the zoning system can save money.

Keywords: Students' Perception, Zoning-Based PPDB

Introduction

Education became a basic necessity for everyone in this Globalization Era. Education is a conscious and planned effort to realize learning process, so learners can actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble moral, as well as the necessary skills of themselves, society, nation and country (Law of the Republic of Indonesia Number 20 of 2003 on The National Education System Article 1 Paragraph 1).

Education is a conscious effort for society development based on a certain rationale, such as philosophy view and socio-cultural background of the society (Siswoyo, 2013: 1). Therefore, it can be concluded that education is a conscious and planned effort based on certain thoughts to realize learning that is able to develop individual potential.

Education can be conducted formally, non-formally or informally in the society. Formal education is a structured and tiered educational system. Formal education includes primary, secondary and higher education (Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System Article 1 Paragraph 11).

Education consists of components influencing each other including educational objectives, educators, learners, educational tools, educational methods, educational materials and environment (Hangestiningsih, 2015: 27). Besides, education can be constructed of educators, learners, educational objectives, educational tools and educational environment that those components build, connect, depend and define each other (Saat, 2015: 1).

One main component in education is learners. Learners are society members who seek to develop their potentials through learning process available at certain pathways, levels and types of education (Law of the Republic of Indonesia Number 20 of 2003 on the National Education System Article 1 Paragraph 4). In addition, learners are also defined as educational input that determines the success of educational process (Hasbullah, 2010: 121).

Learners are the main subjects in education who have duty to learn, both in school and outside the school (Djamarah, 2011: 80). Learners are individuals who are not dependent on others or can be referred to as self-determining individuals (Imron, 2012: 4).

Learners are a human component occupying as central position in the process of Teaching and Learning Activities (KBM) (Sardiman, 2012: 111). Besides, learners are also considered as a whole society or individual and will be processed through the educational system, so they are able to be a qualified and dignified human beings in accordance with educational objectives (Team of Lecturers of Education Administration, 2014: 204).

Therefore, it can be concluded that learners are society members who are considered as input and the main subject in education seeking to develop self-potential through Teaching and Learning Activities process in order to be able to be a qualified and dignified human being. Therefore, learners have to be well managed.

"Management is a scientific job to identify the best way to carry out certain tasks" (Lunenburg & Ornstein, 2012: 6). Learners management is a process of setting up activities regarding learners matters to achieve educational goals (Hadiyanto, 2013: 5). Activities in learners' management include learner planning, new learner admission, new learner orientation, regulating the presence and absence of learner, organizing learner grouping, organizing learner evaluation, arranging rate development, arranging mutation and drop out, and regulating the code of ethics, courts as well as student discipline (Imron, 2012: 5).

Learners management begins with learner planning and new learner admission activities. New Learner Admission Activities abbreviated as PPDB are the acceptance of new learners in kindergarten and school (Ministry of Education and Culture, 2019). PPDB is a process of registration and service of new learners at school level with the requirements set by the school (Mustari, 2014: 111). PPDB is an administrative process carried out annually to select prospective learners, whether junior high school, senior high school or vocational high school based on certain standards in order to continue to the higher-level education (Nizarman, 2015: 225). Therefore, it can be concluded that PPDB is the administrative process including registration activities and services of new learners at a school level through certain requirements and implemented annually. PPDB is conducted to select prospective learners, whether junior high school, senior high school, or vocational high school based on established standards.

Currently, PPDB activities are carried out through zoning system. Zoning is a PPDB system emphasizing the distance or radius between a students' residence and the school. Therefore, students who are closer to the school, the more chance to have educational services from that school (Nurlailiyah, 2019: 14).

Zoning is defined as a division of an area into several parts in accordance with the functions and objectives of management that become the main foundation in the school reform designing ranging from kindergarten to senior high school (Perdana, 2019: 82). The zoning system aims to continue the government efforts to accelerate education equality.

Zoning-based PPDB is an admission activity for new students based on domicile at the nearest zone radius of the school whose determination is adjusted to the regional conditions including the number of capacities from each school with the availability of school-age children in the area (Safarah & Wibowo, 2018: 210).

The zoning policy in PPDB still causes some problems, including the technical implementation of PPDB causing chaos among the society, the availability of public schools is not evenly distributed in all regions, the zoning system with distance priority causes decreasing students motivation because grades or achievements considered undominant, the dichotomy of excellent and non-excellent schools developing in the society and ineffective coordination among institute so the applicable education policy is not sustainable (Wahyuni, 2019: 14).

From the arisen problems, a study of the perception of new learners is needed to be the main object of education towards the implementation of PPDB zoning. Perception is the process of sensing and interpreting thing or a process of acceptance of stimulus by individuals through sensory tools (Walgito, 2010: 1). Perception is also defined as a process of information entry into the human brain that continuously relates to the environment through the five senses (Slameto, 2010: 102). Therefore, the perception of learners can be understood as the process of sensing information received by learners towards a thing.

The problem in this study is how do new learners perceive the implementation of zoning-based PPDB? This study focuses on the perception of new junior high and senior high school students towards the implementation of zoning-based PPDB and the profile of new junior high and senior high school students, including the distance of residence, the entrance and the USBN/UN mark of new learners.

Literature Review

a. Learner Management

Learner management has several objectives, including improving the knowledge, skills and psychomotor, transferring and developing general abilities or intelligence, talents and interests of learner (Badrudin, 2014: 24). In addition, learner management aims to transfer the aspiration, expectation and meet the learner's needs, as well as learner is able to achieve happiness and welfare in a better life and can learn well in achieving goals.

The principles in the management of learners, among which must refer to the prevailing regulations, are seen as an overall part of institutional management (Education Administration Lecturer Team, 2014: 206). In addition, learner management activities must be pursued to unite learner who have diverse backgrounds and differences in order to understand each other and respect each other. Learner management must also uphold the principle that its activities seek to regulate the development of learner' potential, must be able to encourage and trigger the learner' independence and able to run functionally the learner' lives, both in school and in the future.

b. PPDB-Based Zoning

The objectives of the PPDB zoning system are to ensure the new learner admission conducted objectively, transparently, accountable, nondiscrimination and fair in order to encourage increased access to educational services. In addition, to ensure the availability and readiness of educational units, especially, public schools, they are able to provide quality education services (Ministry of Education and Culture, 2018: 14).

Besides, PPDB zoning system aims to ensure equal access and quality of equitable education in each zone or region that is determined through distance learner's residence and ensure the fulfillment of competent educators and education personnel supported by adequate infrastructure and facilities that can be provided and used together

by educational unit in the service or designated zone. PPDB zoning system also aims to control and guarantee the quality of graduates and supervise the process and learning outcomes comparatively and competitively in education services zone in a measurable and sustainable manner.

Purwanti's research results (2018: 5) explained that the implementation of zoning-based PPDB policy in the academic year of 2018/2019 is more effective, when compared to the implementation of zoning-based PPDB policy in the academic year of 2017/2018. That is, although it does not produce significant changes, but it has to be recognized that there are efforts from the government to improve education policies that have been implemented before. Based on the description above, the purpose of this research is to find out the perception of new learners towards the implementation of zoning-based PPDB.

Methods

This research is part of the Education Zoning Implementation Policy Evaluation study conducted in 2019 by the Policy Research Center of the Ministry of Education and Culture. The research method in the study of Evaluation of Education Zoning Implementation Policy was mixed method approach. Mixed method is a research method that combines two research methods at once, namely qualitative and quantitative in a research activity, so the more comprehensive, the more valid, reliable and objective data will be obtained (Sugiyono, 2011: 18).

Primary data related to the motivation of learners is obtained through the dissemination of questionnaires filled out by learners. The data is processed to obtain information about the perception of learners related to the implementation of zoning-based PPDB.

Samples taken in this study used purposive sampling techniques. Purposive sampling technique is a technique of determining samples in an area with a dense category of schools and areas with rare categories of schools. Areas that are classified as dense in the sample are the city of Bandung, Surakarta, and the city of Surabaya. Sample areas are relatively rare schools in Pontianak and Serang. Data analysis techniques using Miles and Huberman models are carried out interactively and continuously, so the obtained data is saturated. The steps in data analysis of this model include data collection, data reduction, data presentation and inference and verification (Miles & Huberman, 2014: 16).

Results and Discussions

New Students of Junior High school and Senior High School Perception of New Students of Junior high and Senior High School.

Based on the perception of new junior high school students who follow the zoning-based PPDB with total of 1,375 respondents, new students at junior high school level agree that the zoning system can provide a sense of justice amounted 74%. This means that the zoning-based PPDB system can provide certainty to children who live close to the school to make them able to enter the intended school regardless of academic achievement.

The students were asked if the zoning system could eliminate favorite school labels, the students who answered agreed is 53% and those who disagreed is 47%. It shows that school with favorite label still remains as a favorite, because it is related to the facilities and infrastructure as well as the implementation of the learning process existing today in the school.

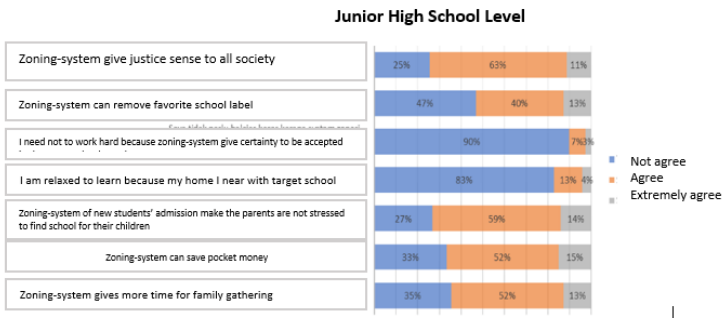

Figure 1: Perception of Junior High School Students in Grade VII (N = 1,375)

The students are asked about the zoning system, students do not need to study hard because the zoning system provides certainty for students close to where they live and resulted amount 90% students who disagree. It means that zoning system does not decrease the spirit of learning. If there is an opinion that students' motivation to learn to go down, this is an individual problem.

The students were asked that the zoning system could save money, 67% of the students agreed and 33% disagreed. This means that the zoning system can save money because students are close to home or shelter.

Based on the perception of new high school students who follow the zoning-based PPDB with a number of respondents 1,525, the result is slightly different from the new students of junior high school level from senior high school. It is stated that the zoning system can provide a sense of justice amounted 45% and who expressed disapproval is 55%. That is, the zoning-based PPDB system for new students of senior high school still does not provide a sense of justice.

The students were asked if the zoning system could eliminate favorite school labels, 72% of students and those who disagreed are 28%. This suggests that with the school zoning system that originally got the favorite label will be lost, because all students can enter without considering academic achievement.

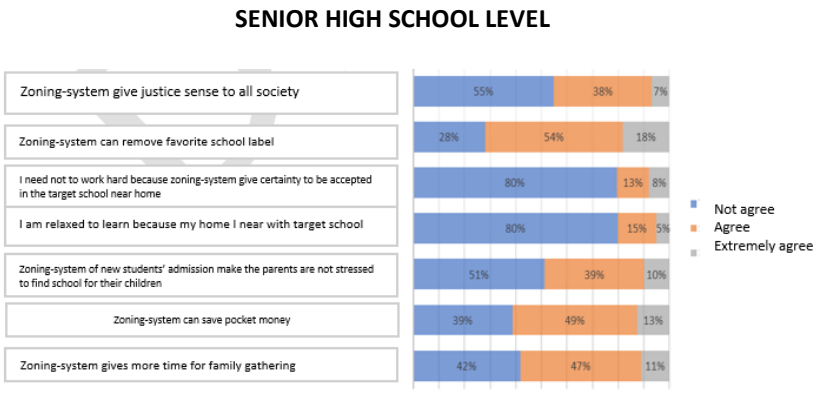

Figure 2: Perception of Senior High School Students Grade X (N = 1,525)

When senior high school students are asked about the zoning system, students do not need to study hard because the zoning system provides certainty for students who are close to where they live to be accepted, then the students who answer disagree are 80%. That is, the zoning system does not decrease the spirit of learning. There is information that there is a child who states the motivation of learning is down, it is an individual problem.

When students were asked that the zoning system could save students money, there are 62% students agreed and 38% disagreed. This means that the zoning system can save money on snacks, because students are close to home.

Profile of New Students of Junior High school and Senior High School

The things discussed in the new students of junior high and high school through three aspects including the distance of residence of new students, the entrance of new learners, USBN / UN scores of new learners.

New Junior High School Students

Based on data and information obtained from the implementation of PPDB junior high school based on zoning in 2019, the condition of the distance between students and the school has shown that most of the students are in a position close to the school. As Shown in Figure 3, that the distance from where the learner lives with the school is mostly less than 2 km. This shows that with PPDB junior high school through zoning-based, it is more guaranteed that students who live close the school to get the intended school.

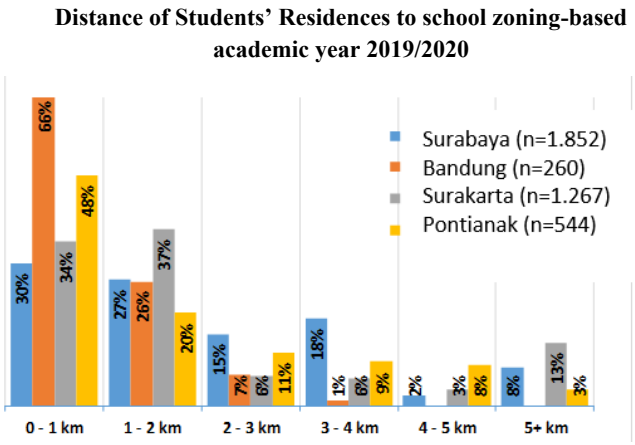

Figure 3: Distance between Students' Residences and School

Junior high school students based on residences are Surabaya amounted 1,852 students, followed by Surakarta amounted 1,267 students, Pontianak amounted 544 students and Bandung amounted 260 students. The distance of home is classified into five categories, including 0-1 km, 1-2 km, 2-3 km, 3-4 km, 4-5 km and 5 km more. The distance of 0-1 km is located in three cities, including Surabaya (30%), Bandung (66%) and Pontianak (48%). In contrast, the smallest residential distance is Surabaya (2%) and Surakarta (3%) with distance of 4-5 km, Bandung (3%) with a distance of 3-4 km and Pontianak City (3%) with a distance of more than 5 km. Thus, it can be concluded that in these four cities have followed the zoning rules, so these are more at a small distance of 0-1 km and 1-2 km.

Based on the obtained data, junior high school in new students' admission has gone through the zoning system. New junior high school students based on the most admission routes are Surabaya city amounted 2,216 students, followed by Surakarta city amounted 1,194 students, Pontianak City amounted 429 students and Bandung amounted 293 students. The learners' admission process consists of three aspects, namely zoning, achievement and transfer of parental duties. Based on the admission route, the highest route is through zoning in all cities, namely Surabaya (93.7%) Bandung (88.7%), Surakarta (91.5%) and Pontianak (75.1%). Therefore, it can be concluded that the zoning system has been well implemented in the four cities. This is shown in Figure 4.

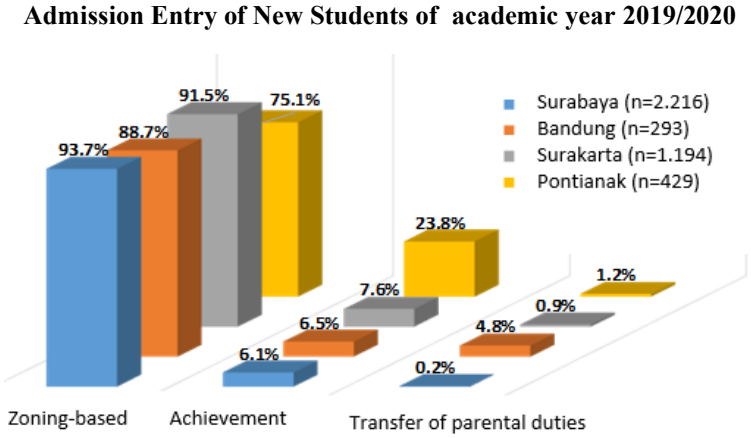

Figure 4: New Learner Entrance

Based on USBN scores data in junior high school shows the various of academic ability. This is shown in Figure 5, it was illustrating that academic ability in new learners in one class is different from low and high ability.

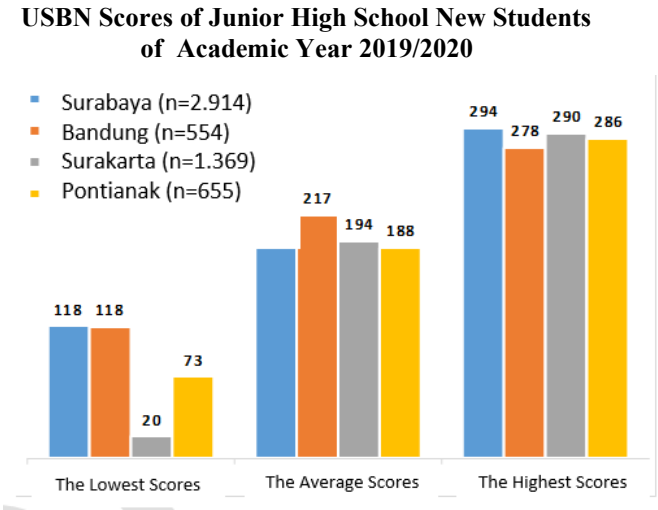

Figure 5: Average USBN Scores of Junior High School New Students

The greatest number of junior high school new students from USBN score is Surabaya amounted 2,914 students, followed by Surakarta amounted 1,369 students, Pontianak city amounted 655 students and Bandung amounted 554 students. New learners' USBN scores consist of lowest grades, average grades, and highest grades. The results showed that the highest score in four cities is almost similar between 294 (Surabaya), 278 (Bandung), 298 (Surakarta) and 286 (Pontianak), but when viewed the average scores, it results if Surabaya (241) is the largest, Bandung (217), Surakarta (194) and Pontianak (188). The conclusion is there is no relation between new learners when viewed from USBN results with zoning system determination. Therefore, this zoning system, the new learners have heterogeneous abilities.

New junior high school students gave a perception of zoning-based PPDB amounting to 1,375 students. New students of junior high school agree that the zoning system can provide a sense of justice amounted 74%. It means that the zoning-based PPDB system can provide certainty to students who live close to the school to be able to enter the school regardless of academic achievement.

The students were asked if the zoning system could eliminate favorite school labels or not. It is resulted that 53% agree and 47% disagree. It shows that the school that have the favorite label still remains as favorite one, because it is related to the facilities and infrastructure and the implementation of the learning process.

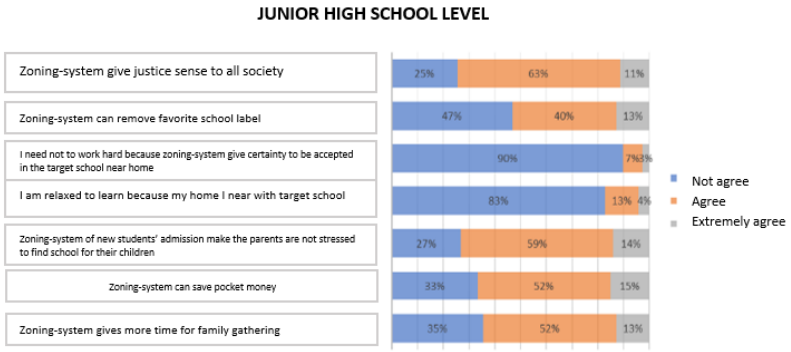

Figure 6: Perception of Junior High School Students in Grade VII (N = 1,375)

Students were asked regarding zoning system, if students do not need to study hard because it provides certainty for students who are close to school, resulted 90% students disagree. That is, the zoning system does not decrease the spirit of learning. There is issue stating that motivation of students in learning is down, this is an individual problem.

When students were asked that the zoning system could save money, resulted 67% agree and 33% disagree. It means that zoning system can save money on snacks.

New Students of Senior High School

Based on data and information obtained from the implementation of PPDB senior high school zoning-based in 2019, the condition of residential distance with the school has shown that most of the students are in a position close to the school. As shown figure 7, the distance of residence of learners, less than 2 km. It shows that with PPDB senior high school based on zoning system is more guarantee new high school students who live close to the school to get the intended school.

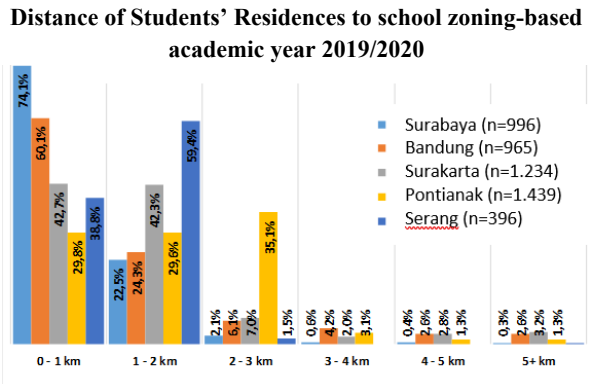

Figure 7: Distance from Senior High School Students' Residence to School

New students of based on the most entrance routes are Surakarta amounted 2,266 students, followed by Pontianak with 1,640 students, Surabaya with 1,136 students and the smallest is Bandung amounted 1,073 students. The entrance of learners consists of three aspects including zoning, achievement and transfer of parental duties. Based on the entrance route, the highest zoning are Bandung (89.9%) Surakarta (80.3%), Pontianak (86.0%) and Surabaya (73.9%). While, there are 25% through achievement entrance route. Therefore, it can be said that the zoning system has been well implemented in the four cities.

Based on the data obtained, all high schools accept new learners through zoning system. It shows that in the sample area of senior high school, most new learners enter the zoning system with proportions in accordance with The Minister of Education and Culture Regulation No. 20 of 2019.

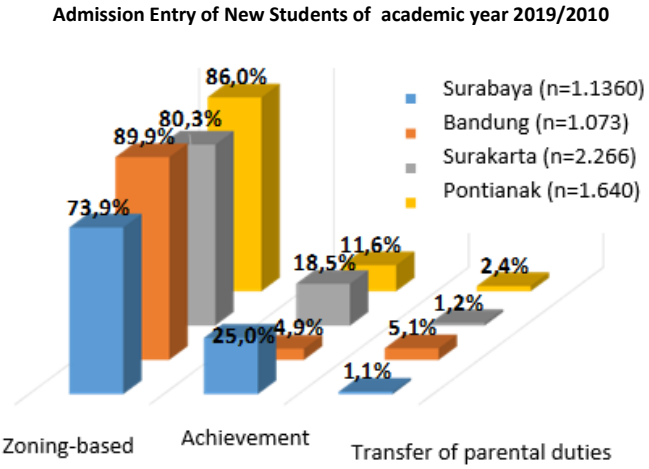

Figure 8: Entry pathway for Senior High School Students

New students of senior high school based on the most entry pathway is Surakarta amounted 2,266 students, Pontianak amounted 1,640 students, Surabaya amounted 1,136 students and Bandung amounted 1,073 students. The entry pathway of learners consists of three aspects including zoning, achievement and transfer of parental duties. Based on the entry pathway, the highest is Bandung (89.9%), Surakarta (80.3%), Pontianak (86.0%) and the lowest is Surabaya (73.9%). Therefore, it can be concluded that zoning system has been well implemented in the four cities.

Based on UN score data in senior high school shows that academic ability is various. This is shown in Figure 9 which illustrates that the academic abilities of new learners in one class vary from low to high ability.

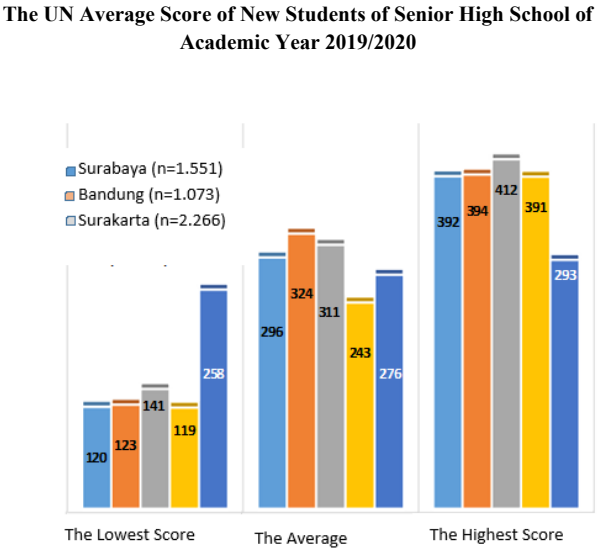

Figure 9: The UN Average Score of New Students of Senior High School

There is no correlation between new senior high school students viewed from UN scores with the determination of zoning system. Therefore, it can be said that new high school students have heterogeneous abilities.

There are 1525 students of new senior high school students give a perception of zoning-based PPDB. Senior high school students agree that the zoning system can provide a sense of justice as much as 45% and 55% students who disagree. The zoning-based PPDB system for new students of senior high school still does not provide a sense of justice.

The students were asked if the zoning system could eliminate favorite school labels or not, 72% of students agree and 28% disagreed. This suggests that with the school zoning system that has favorite label will be lost, because all students can enter without considering academic achievement.

The students were asked about zoning system where the students do not need to study hard because it provides certainty for close residence students, resulted 80% students disagree. The zoning system does not decrease the spirit of learning. If there is opinion if learning motivation down, it is an individual problem.

The students were asked that the zoning system could save money, 62% students agreed and 38% disagreed. That is, the zoning system can save money on snacks.

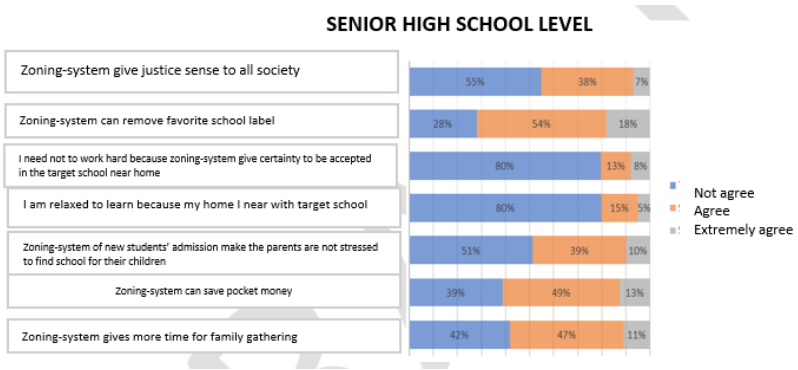

Figure 10: Perception of Senior High School Students Grade X (N = 1,525)

Conclusion and Suggestion

Conclusion

The results show that the zoning-based PPDB for junior high school and senior high school can provide certainty for children who live close to the school to be able to enter the target school regardless of academic achievement. Schools that initially received favorite label are still favorites, because they are related to the facilities and infrastructure as well as the implementation of the existing learning process at the school. In addition, the zoning system based on student perceptions does not reduce enthusiasm for learning. The zoning system has been well implemented in four cities, including Surabaya, Bandung, Surakarta and Pontianak.

Suggestion

Based on these conclusions, several suggestions can be formulated, including the government needs to evaluate the distribution of schools so that the existence of schools is evenly distributed in an area. Zoning-based PPDB socialization in the school environment needs to be maximized. The principal should improve the quality of facilities and infrastructure for the implementation of the teaching and learning process in schools.

References

Badrudin. 2014. *Manajemen Peserta Didik.* Jakarta: Indeks.
Djamarah, Syaiful Bahri. 2011. *Psikologi Belajar.* Jakarta: Rineka Cipta.
Hadiyanto. 2013. *Manajemen Peserta Didik Bernuansa Pendidikan Karakter.* Jakarta: Al-Wasath.

Hangestiningsih, Endang, dkk. 2015. *Pengantar Ilmu Pendidikan.* Yogyakarta: Universitas Sarjanawiyata Tamansiswa.
Hasbullah. 2010. *Otonomi Pendidikan.* Jakarta: PT Rajawali Pers.
Imron, Ali. 2012. *Manajemen Peserta Didik Berbasis Sekolah.* Jakarta: Bumi Aksara.
Kementerian Pendidikan dan Kebudayaan. 2018. *Sistem Zonasi Strategi Pemerataan Pendidikan yang Bermutu dan Berkeadilan.* Jakarta: Pusat Data dan Statistik Pendidikan dan Kebudayaan.
Kementerian Pendidikan dan Kebudayaan. 2019. Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia Nomor 20 Tahun 2019 tentang Perubahan Atas Peraturan Menteri Pendidikan dan Kebudayaan Nomor 51 Tahun 2018 tentang Penerimaan Peserta Didik Baru pada Taman Kanak-Kanak, Sekolah Dasar, Sekolah Menengah Pertama, Sekolah Menengah Atas, dan Sekolah Menengah Kejuruan. Jakarta.
Kementerian Pendidikan dan Kebudayaan. 2019. Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia Nomor 44 Tahun 2019 tentang Penerimaan Peserta Didik Baru pada Taman Kanak-Kanak, Sekolah Dasar, Sekolah Menengah Pertama, Sekolah Menengah Atas, dan Sekolah Menengah Kejuruan. Jakarta.
Lunenburg, Fred, & Ornstein, Allan. 2012. *Educational Administration Concepts and Practices*. California: Wadsworth.
Miles, Matthew, & Huberman, Michael. 2014. *Analisis Data Kualitatif Buku Sumber tentang Metode-Metode Baru.* Jakarta: UI Press.
Mustari, Mohamad. 2014. *Manajemen Pendidikan.* Jakarta: Raja Grafindo Persada.
Nizarman. 2015. Manajemen Penerimaan Siswa Baru. *Jurnal Manajer Pendidikan, Volume 9, Nomor 2,* 225.
Nurlailiyah, Aris. 2019. Analisis Kebijakan Sistem Zonasi terhadap Perilaku Siswa SMP di Yogyakarta. *Jurnal Realita, Volume 17, Nomor 1,* 14.
Perdana, Novrian Satria. 2019. Implementasi PPDB Zonasi dalam Upaya Pemerataan Akses dan Mutu Pendidikan. *Jurnal Pendidikan Glasser, Volume 3, Nomor 1,* 82.
Purwanti, Dian, dkk. 2018. Efektivitas Kebijakan Penerimaan Peserta Didik Baru Sistem Zonasi bagi Siswa Rawan Melanjutkan Pendidikan. *Jurnal Ilmiah Ilmu Administrasi Negara, Volume 5, Nomor 4,* 5.
Saat, Sulaiman. 2015. Faktor-Faktor Determinan dalam Pendidikan (Studi tentang Makna dan Kedudukannya dalam Pendidikan). *Jurnal Al-Ta'dib, Volume 8, Nomor 2,* 1.
Safarah, Azizah Arifinna, & Wibowo, Udik Budi. 2018. Program Zonasi di Sekolah Dasar sebagai Upaya Pemerataan Kualitas Pendidikan di Indonesia. *Jurnal Lentera Pendidikan, Volume 21, Nomor 2,* 210.
Sardiman. 2012. *Interaksi dan Motivasi Belajar Mengajar.* Jakarta: Raja Grafindo Persada.
Siswoyo, dkk. 2013. *Ilmu Pendidikan.* Yogyakarta: UNY Press.
Slameto. 2010. *Belajar dan Faktor-Faktor yang Memengaruhinya.* Jakarta: Rineka Cipta.
Sugiyono. 2011. *Metode Penelitian Kuantitatif, Kualitatif, dan R&D.* Bandung: Afabeta.
Tim Dosen Administrasi Pendidikan. 2014. *Manajemen Pendidikan*. Bandung: Alfabeta.
Undang-Undang Republik Indonesia Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional. 2003. Jakarta: Departemen Pendidikan Nasional.
Wahyuni, Dinar. 2019. Permasalahan dan Upaya Perbaikan Sistem Zonasi dalam Penerimaan Peserta Didik Baru 2019. *Jurnal Info Singkat, Volume 11, Nomor 13,* 14.
Walgito, Bimo. 2010. *Pengantar Psikologi Umum.* Yogyakarta: CV Andi.

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The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 12-19
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.169

Educational Needs of Adult Refugees' Educators: A Greek Case Study

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Abstract
In the present paper we tried to describe the educational needs of the adult refugees' educators in the area of Leros, Greece. To collect our data, we used the qualitative approach and conducted interviews throughout the avalanche sampling, so that the participants could express their ideas and perceptions. Our sample consists of adult refugees' educators working in NGO ECHO100PLUS, which is activated in Leros. The analysis of the data revealed the educators' inexperience and lack of training, At the same time, those areas where trainers need further training, as well as their preferences for trainers and the type of training, were recorded.

Keywords: Adult Education, Educational Needs, Refugees' Trainers

1. Introduction

The unprecedented influx of refugees and immigrants into Greece has created new conditions and has pointed out on the one hand the need for support and assistance and on the other hand the problems and shortcomings of Greek structures. The Greek state is called upon to meet the basic needs of a growing refugee population. These needs have to do not only with food and housing, but also with their integration and adaptation to the new cultural environment, mainly through education, not only of children and adolescents, but also of adults.

After all, the main and primary goal of adult education is to compensate for social inequalities through the progress and improvement of the educational level of the vulnerable social groups (Kokkos, 2008, p.9). Adult refugee education programs seem to help improve self-image and self-confidence, smooth socialization and integration into society (Xirouchakis, 2019), as well as to avoid marginalization, social exclusion and social pathogenesis (Bezati & Theodosopou, 2006).

The success factor of a program is, basically, the educator. The educator's work is considered quite demanding, as he/she needs to be knowledgeable about the subject, to know how to perform his/her role and which his/her position in the team is depending on the educational circumstances. In addition, he/she has to cope with adversity arising from the fact that he/she is addressed to a vulnerable group. Of course, even if the educator fulfills all the above criteria, he/she must always be vigilant, as there are additional parameters and obstacles that can put a program at risk.

In general, the education of adults with different nationalities and cultures in combination with the economic and educational deficiencies and weaknesses makes it necessary to probe the educational needs of the adults refugee's trainers that arise from the teaching of a socially vulnerable group, such as refugees.

The aim of this survey is to record the views of trainers teaching adult refugees in Leros about their educational and professional needs. The investigation of the needs of trainers offers important findings that will strengthen the training programmes provided for refugee trainers, as the need for such programmes has arisen in recent years in Leros. (Rogers, 1998, p.51).

In order to achieve this goal, we conducted a qualitative approach, using telephone and live interviews with the adult refugees' educators who work for the NGO ECHO100PLUS. The results of the survey revealed the increased training needs of the refugees' trainers.

2. Literature Review

2.1. Adult education

In general, education is considered the preparation for life. As life is constantly changing, the preparation should be unremitting and endless. Adult education was founded on this basis (Lindeman, 1926, p.3-4). According to Jarvis (2004, p.32), adult education can help people connect more easily with modern culture, make creative use of their free time and enrich their lives. Adult education has its own characteristics. According to Thompson (2019), the characteristics that differentiate it from the education of minors have to do both with the variety of its forms and its voluntary nature, as well as with the fact that it takes care of the individual needs through a detailed curriculum. The great theorists of education, such as Piaget, Vygotsky, etc., often developed conflicting theories concerning the way in which minors and/or adults learn (Kokkos, 1998, p.23). Of course, despite the points of controversy, the above theories have in common the following basic principles:

a) all people have cognitive needs, ie a need for knowledge, exploration and understanding (McLeod, 2018);
b) the active involvement of the learner in the learning process is more effective than the passive transmission of knowledge;
c) all people, depending on their personality, age, and previous educational experiences, express specific preferences as to how they are educated and taught; and
d) previous knowledge and experiences are very important, as they are the foundation for building new cognitive paths (Kokkos, 2008, pp.46-47).

The adult educator to perform his/her work should be guided by the basic principles of adult education, which emphasize in social theories of action and not psychological theories of learning (Collins, 1991), although according to Imel (1998) the above is not a definitive list of adult education principles, but a guide of good practices that the educator should know and handle.

2.2. Vulnerable groups

All people who experience social exclusion, become victims of racism and prejudice and as a result are deprived of access to the labor market (such as people with disabilities, drug users, ex-prisoners, refugees, and minorities) consider to be socially vulnerable groups (Tsimpoukli, 2008, p.281). In the education of vulnerable groups,

especially refugees, both the special needs of this group and the different ethnocultural capital of its members must be taken into account, as they can become causes of a failed educational program (Kefala, 2017).

2.3. Educational needs of adult educators

As noted by Vergidis (2012) several researches have been carried out in Greece, which aimed to investigate the educational needs of teachers. A common denominator of these researches is, inter alia, the need for support and training in the teaching of pupils with different cultural backgrounds, despite the fact that teacher training in intercultural education is a central area in the curricula of the Country's Pedagogical Departments (Palaiologou & Dimitriadou, 2013).

With regard to adult trainers, a recent survey by Brinia, Fotakeli & Vasileiou (2019) highlighted the need for additional training, expertise and information on new knowledge so that they can respond more effectively to their role.

It follows from the above that adult trainers and in particular adult refugee educators have increased educational needs, especially considering that central planning and coordinated efforts on the part of the State are lacking (Kantzou, Manoli, Mouti & Papadopoulou 2017).

Due to the fact that the refugee crisis is a very recent event, not enough research has yet been carried out to investigate and record the educational needs of adult refugee trainers in our country.

However, according to a recent research by Proiou (2019), adult refugee educators need training on intercultural issues and the basic principles of adult education. At the same time, according to international literature, it appears that educators need to be ready to manage deviant behaviors due to traumatic experiences (Gagné, Schmidt & Markus 2017; Richardson, MacEwen & Naylor, 2018), but also to be able to be equipped to facilitate critical and creative engagement with the language of the host country (Nelson & Appleby, 2015).

In general, additional training should be such as to extend flexibility in the selection of teaching practices and methods, but also to foster international awareness and intercultural sensitivity among trainers (Walters, Garii & Walters, 2009).

The above finding is of particular importance, considering the fact that according to Simopoulos (2014) the majority of adult refugee educators in Greece do not introduce intercultural dimensions into their teaching, exploit more conservative educational practices, such as frontal teaching, and maintain stereotypical and derogatory perceptions of different cultures.

3. Methodology

3.1. Qualitative approach

The choice of methodological approach was largely determined by the theoretical position, interests and political perspective of the researchers (Diefenbach, 2008). Additional factors that lead us to this choice are the fact that the literature gives us little information about the obstacles that adult refugee educators face and, therefore, it is very important to draw information from the participants themselves through investigation (Mason, 2003, p.96), as well as the fact that the size of the available sample makes the qualitative approach necessary (Creswell, 2016, p.209).

3.2.Sampling and data collection process

The sample consisted of 9 educators who were teaching in 2019-2020, when the researsh was conducted, or had recently taught adult refugees in Leros. The sample was selected based on speaking Greeks, in order to facilitate the research and to avoid any wrong conclusions due to the translation. Participants were approached through the

avalanche process (Creswell, 2016, p.206, 209). The first seven interviews were conducted by telephone due to quarantine, while the last two of them were conducted live.

3.3. Limitations of the research

In the present study a first constraint stems from the fact that most of the data were collected by telephone. Although its implementation was imposed by the circumstances, it nevertheless creates research limitations related to the impossibility of recording non-verbal frameworks and actions (Bergmann, 2004, p.301).

Our research deals with a phenomenon (the refugee crisis), which is quite recent. As a result, there are not enough references to ensure high levels of quality, such as books or scholarly articles. The use, mainly, of early stage material creates another limitation in our research (Creswell, 2016, p.86).

Taking into account the above limitations we can say that the results obtained from the present study cannot be generalized. The present research recorded a reality at a given time in a given place. The results compose an interpretation, which, however, cannot be arbitrarily transferred to different contexts (Matt, 2004, p.328).

4. Results and Discussion

4.1 Lack of training – aspects of training

The participants' responses show that only 2 out of 9, i.e. have attended some kind of training in teaching vulnerable groups.

In more detail, the first participant argued that: *"I did not have such teaching experience before I started work, the truth is"*. The next participant said the same thing: *"in general, I have not done any training, I have not been taught how to teach"*. The following participants were also involved in this with phrases such as: *"no, and I am sure it would help a great deal"*, *"no, unfortunately and it is something I would like to do"*, etc.

The only exceptions were one participant (5th interview) who stated: *"I have done, but not on the subject of music"* and one participant (6th interview) who stated that: *"yes, let's say. Elders, because they too are actually considered (vulnerable group) and I have also been certified"*.

There is therefore a need for a debate on the areas in which adult refugee educators need training.

4.1.1 Adult education – vulnerable groups

Studying the results of the present research, we find that Leros 4 out of 9 adult refugee trainers expressed a desire to be educated on the basic principles of adult and vulnerable groups education, as the Proiou survey (2019) shows too.

More specifically, the fourth participant said he would like to be educated in teaching *"both adult and vulnerable groups"*. The seventh participant prefers training in the teaching of vulnerable groups, as he said that: *"I would like to be trained in how we trainers should treat people who have [...] difficult experiences*". In the same context, the last two participants argued that they would like to be educated on *"adult education and not just for vulnerable groups"* and *"something in a more general context (on adult education)"*.

4.1.2 Psychology

In addition 3 out of 9 stated that they would also like to be educated in psychology so that they can manage deviant behaviours resulting from traumatic experiences. The importance of managing painful experiences on the part of the instructor is also underlined by the international literature (Gagné, et al, 2017; Richardson, et al, 2018).

The first participant stressed the importance of *"understanding how you can help people who have suffered psychological trauma"*. The third participant seems to have the same concern, who said that he would like to be educated *"in the part of supporting these people. Psychology or something like that"*, but also the sixth participant who stated that: *"I would like psychology"*.

4.1.3 Interculturalism - culture

2 participants understand the importance of forming intercultural awareness, getting to know the national and cultural capital of their learners and adopting corresponding educational practices, a fact that emerges from Simopoulos' research (2014) as well.

The first participant stated that she would like to be educated *"on the culture of refugees from the countries they come from"* and *"how you deal with a class that has within a mix of nationalities and different cultural elements"*. The second participant indirectly advocated the above, which stressed the difficulty of selecting scenes in the cinema course because of different religious and cultural beliefs (*"cinema by its very nature also has [...], excessive violence or sex. [...] I don't know if there's a way [...] to make a choice, what I could show them because they're also persons that we don't know exactly where they come from and I didn't want to show them overly violent scenes"*).

4.1.4 Teaching foreign languages

One thing mentioned in the literature (Nelson & Appleby, 2015), but only one participant in this study argued is training in how to teach the language (in this research English and not the language of the host country, as Nelson & Appleby, 2015 report). In particular, the sixth participant highlighted the importance of *"languages and education"*.

4.1.5 No further education

One participant stated that he did not wish to be educated.
To be more specific, the fifth participant argued that: "*I do not have anything to work on"*.

4.2 Selection of trainers

With regard to the characteristics that the instructor should have, participants seem to largely agree that the most basic thing is to have experience in teaching refugee trainers, but also a good knowledge of his/her subject. Some participants refer to the mood and love for their work and the knowledge of current events.

4.2.1 The role of the experience

The majority of participants consider that someone who has experience in the training of vulnerable groups and can give practical and meaningful guidance is more appropriate.

In more detail, the first participant stated that the experience of the instructor plays an important role (*R: So the experience plays an important role. M: Yes*). The third participant argued that he/she would be more appropriate to be *"someone who knows the situation and is also in the situation, to have the experience"* Respectively, the fourth participant would choose as trainer *"someone who would have experience"*. For the fifth participant, the trainer should have *"a set"* of knowledge and experience. The seventh participant would like to be educated by *"someone who knows the situation and is in the middle of things and of course has the experience"*. The eighth participant also agreed (*"a person or a group of people who would have experience"*), but also the ninth participant (*"it has to do with the experience in the subject matter"*).

4.2.2 Theoretical background

4 participants consider that it is also very important that the trainer, in addition to experience, is aware of the theoretical background of the basic principles of adult education.

The first participant argued that the instructor should possess *"a combination (knowledge) for adult education and intercultural education"*. The fifth participant pointed out the same (*"it's a total"*), as the eighth participant (*"a man or a group of people who would have experience and knowledge"*) and the ninth participant (*"wants a theoretical basis"*) did.

4.2.3 Love for his/her work

One participant argues that the educator is necessary to love what he/she does. In particular, the sixth participant stresses that it is important *"to love it"*.

4.2.4 Knowledge of the current affairs

One participant argues that the instructor must be aware of the current situation in order to be efficient. More specifically, the ninth participant highlights the importance of *"monitoring the updates of the time"*.

4.3 Types of training

Of course, we could not omit the participants' preferences as to the type of training. Based on their interviews, the majority prefers mixed training methods, while the rest share equal life and distance learning,

4.3.1 Mixed training type

The type of education chosen by Leros adult refugee trainers seems to be a combination of living and distance learning, as while they find lifelong learning more efficient, they take into account the factor of the difficulty of travel due to insularity – barren line and recent travel restrictions.

More precisely, the first participant stressed that she would prefer something that combines both (live and distance education): *"personally I prefer lifelong learning, [...] but because most of us are on islands I think the solution of on-line education is more practical"*. The second participant stated that in order to be educated, she would choose a programme *"combining both (live and distance)"*. The third participant argues that *"living education is irreplaceable, but also because of the special situation, with quarantine and all this I believe that good work can be done at a distance"*, to conclude that *"if there was a way to combine these two we would talk [...] for ideal situations"*. The seventh and eighth participants also argued that *"a combination of the two would be ideal"* and that *"because we live on an island and the movements are not always favorable, [...] the combination would be ideal"*.

4.3.2 Distance training

The fourth participant pointed out the obstacles that lifelong learning would encounter and the primacy of distance learning (*"because of the restrictive measures everything works remotely. But even without the restrictive measures the fact that we live in Leros..."*). The last participant argued that *"live (learning) helps more, but since I live and work in Leros I would prefer it remotely because it is difficult to travel"*.

4.3.3 Live training

On the contrary, the fifth participant prefers *"live"*, as does the 6th participant who states that prefers personal contact (*"(My children) prefer personal contact. So am I"*).

5. Conclusions

According to the data collected, the majority of trainers want to be educated on the basic principles of adult and vulnerable group education, diversity and interculturalism issues and psychology. The above are consistent with findings of research carried out in Greece on adult trainers and refugee trainers (Brinia et al, 2019· Gagné et al, 2017· Nelson & Appleby, 2015· Palaiologou & Dimitriadou, 2013· Proiou 2019· Richardson et al, 2018). The voluntary nature of the whole project is entirely related to the fact that the training of refugees was undertaken by trainers who are mostly inexperienced. This makes the need for training, particularly in adult education and intercultural education, all the more urgent. Psychology is also a very serious area, but it can be covered by the use of psychologists and/or social workers, who will support both refugees and their trainers. Participants choose to be trained using mixed teaching methods. Although most argue that the personal contact that lifelong teaching provides is irreplaceable, the fact that they live and work on a remote island such as Leros, and recent travel bans due to the coronavirus emergency, have led them to reconsider and to evaluate the benefits of distance learning, ending with the choice of mixed methods. Ideally, as trainers, participants would like people who are primarily experienced, ie have their own knowledge of the conditions faced by both refugees and educators, so that they can give them tangible advice with immediate results, and secondly, be adequately theoretically trained.

In a future research, the views of the trainers regarding the duration of the training could be explored, as well as the possibility of practical application in the context of the training, as the above were issues raised by participants in the present study. The role played by demographics (gender, age, marital status) in the educational choices of participants/subjects could also be explored.

References

Bezati, Th., & Theodosopoulou, M. (2006). Objectives of intercultural education and the role of adult education. In Z. Koromilou, D. Mouzakis, V. Sotiropoulou, N. Tsergas, & S. Chanis (Ed.), Proceedings of the Panhellenic Scientific Conference with International Participation "Lifelong Learning for Growth, Employment and Social Cohesion", Volos, 31th March-2nd April 2006, p. 181-186. Athens: Korifi A.E. (In Greek)

Brinia, V., Fotakeli, M., & Vasileiou, C. (2019). Adult tutors' views on their educational needs: the case of a Public Institute of Vocational Training in Greece. *International Journal of Higher Education and Sustainability,2*(4). https://doi.org/10.1504/IJHES.2019.103398

Collins, M. (1991). *Adult Education as Vocation: a Critical Role for the Adult Educator*. Retrieved from https://eric.ed.gov/?id=ED360505 (28/12/2019)

Creswell, J. (2016). *Research in education*. Athens:Ion. (In Greek)

Diefenbach, T. (2008). Are case studies more than sophisticated storytelling?: Methodological problems of qualitative empirical research mainly based on semi-structured interviews, *Quality and Quantity, (43),* 875-894. DOI 10.1007/s11135-008-9164-0

Gagné, A., Schmidt, C., & Markus, P. (2017). Teaching about refugees: developing culturally responsive educators in contexts of politicized transnationalism. *Intercultural Education*, *28*(5), 429-446. DOI: 10.1080/14675986.2017.1336409

Imel, S. (1998). Using adult learning principles in adult basic and literacy education. Ohio: Centre for Education and Training for Employment, Ohio State University. [Online]. Available: https://pdfs.semanticscholar.org/67ad/dc0e498d330bc75c949a72881d4490e3d3bd.pdf Accessed 09/02/2020.

Jarvis, P. (2004). *Adult Education and Lifelong Learning: Theory and Practice* (3rd ed.). London and New York: Routledge Flamer Taylor & Francis Group.

Kantzou, V., Manoli, P., Mouti, A., & Papadopoulou, M. (2017). Language education for refugees and migrants: Multiple case studies from the Greek context. *Διάλογοι! Θεωρία και πράξη στις επιστήμες αγωγής και εκπαίδευσης, 3*, 18-34. doi:http://dx.doi.org/10.12681/dial.15000

Kefala, A. (2017). *Study of the experience and educational needs of adult Syrian refugees: a biographical/phenomenological approach.* (Postgraduate work). University of Macedonia, Thessaloniki. (In Greek)

Kokkos, A. (1998). Principles of adult learning. In Kokkos, A., & Lionarakis, A. (Ed.), *Open and distance education*, pp 19-50, Patra: Hellenic Open University. (In Greek)

Kokkos, A. (2008). *Theoretical Approaches*. Patra: Helleniv Grrek University. (In Greek)

Lindeman, E. C. (1926). *The meaning of Adult Education*. New York: New Republic, Inc.

Mason, J. (2003). *The Conduct of Qualitative Research*. Athens: Ellinika Grammata. (In Greek)

Matt, E. (2004). The Presentation of Qualitative Research. In Flick, U., von Kardoff, E., & Steinke I. (Ed.), Jenner, B. (Translation), *A Companion to Qualitative Research* (pp 326-328). Sage Publications: London. Available: https://www.researchgate.net/profile/Stephan_Wolff2/publication/305496229_Wolff_in_Flick_et_a/links/5792046008aec89db77fca3c/Wolff-in-Flick-et-a.pdf#page=268 Accessed 18/03/2020.

McLeod, C. (2018). Maslow's hierarchy of needs. [Online]. Available: https://calpro-online.org/ERIC/docs/dig200.pdf Accessed 09.02.20.

Nelson, C. D., & Appleby, R. (2015). Conflict, militarization, and their after-effects: Key challenges for TESOL. *TESOL Quarterly, 49*(2), 309–332. https://doi.org/10.1002/tesq.187

Palaiologou, N., & Dimitriadou, C. (2013). Multicultural/Intercultural Education Issues in Pre-service Teacher Education Courses: The Case of Greece, *Multicultural Education Review, 5*(2), 49-84. DOI: 10.1080/2005615X.2013.11102902

Proiou, E. (2019). *Greek language teachers for refugees and immigrants over the age of 18: Investigation of their educational perceptions as well as their training needs in relation to the Adult Education Authorities.* (Bachelor's thesis). Hellenic Open University, Patras. (In Greek)

Richardson, E., MacEwen, L., & Naylor, R. (2018). Teachers of Refugees: A review of the literature. Reading: Education Development Trust. [Online]. Available: https://eric.ed.gov/?id=ED588878 Accessed 18/11/2019.

Rogers, A. (1998). *The adult's education*, Athens: Metaichmio. (In Greek)

Thompson, J. L. (2019). *Adult Education for a change*. London and New York: Routledge Taylor & Francis Group.

Simopoulos, G. (2014). *The intercultural competence of the adult educator: A research in the field of teaching Greek as a second language.* (Doctoral Thesis). University of Patra, Patra. (In Greek)

Tsimpoukli, A. (2008). The Training of Special Groups. In Vaikousi, D., Valakas, I., Giannakopoulou, E., Giastas, I., Kokkos, A., & Tsimpoukli, A. (Ed.), *Educational Methods – Group of Trainees*, (pp 281-298). Patra: Hellenic Open University. (In Greek)

Vergidis, D. (2012). Teacher training in Greece as a dimension of educational policy. *Science and Society: Review of Political and Ethical Theory, 29*, 97-126. doi: http: //dx.doi.org/10.12681/sas.871 (In Greek)

Walters, L. M., Garii, B., & Walters, T. (2009). Learning globally, teaching locally: incorporating international exchange and intercultural learning into pre-service teacher training, *Intercultural Education, 20(*1), 151-158. DOI: 10.1080/14675980903371050

Xirouchakis, M. (2019). *The contribution of adult education to the empowerment of adult refugees on the island of Leros.* (Diploma thesis). Hellenic Open University, Leros. (In Greek)

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The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 20-26
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.170

Development of Content Representation (CoRe) Framework as Analysis Instrument of Pedagogical Content Knowledge Capability for Biology Teachers

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Abstract
The results of the preliminary study were obtained from 15 prospective biology teacher students related to the initial abilities that must be possessed to become a teacher and the implementation of learning in science learning. In general, 15 prospective teachers were of the opinion that it was not so different about the ability to have to become a teacher. Based on the results of the preliminary study, prospective teacher students already know the abilities that need to be possessed to become a teacher and in the implementation of learning students must be active but still not showing knowledge related to knowledge that combines content and pedagogical knowledge. One way to analyze the ability of prospective teacher PCK is through filling in documents consisting of Content Representation (CoRe). The data presented in the form of student response questionnaire analysis related to CoRe in terms of education and language and the results of test the validity and reliability of items. For linguistic aspects of CoRe instrument in general CoRe instrument have very high frequency, meaning that CoRe instrument that have been developed are able to be accepted and used properly by prospective biology teacher students at Muhammadiyah Metro University with a percentage 70%. For educational aspects of the CoRe instrument in general CoRe instrument have very high criteria, meaning that the CoRe instrument that have been developed are able to be accepted and used properly by prospective biology teachers at the Muhammadiyah Metro University with a percentage 73,33%.

Keywords: CoRe, Pedagogical Content Knowledge, Biology Teacher

1. Introduction

The teacher is one of the determining factors for the success of the learning process. (Arends, 2007)states that there are 7 categories of domains of knowledge that are important to be mastered by a teacher in order to carry out learning properly, including knowledge about: (a) Content Knowledge; (b) Pedagogical Content Knowledge;

(c) Knowledge of Learners; (d) General Pedagogical Knowledge; (e) Knowledge of Educational Context; (f) Curriculum Knowledge; and (g) Knowledge of Educational ends, purposes, and values.

One of the important knowledge for teachers is *Pedagogical Content Knowledge* (PCK). PCK it is very important for a teacher to create meaningful learning for students. (Abbitt, 2011) states that PCK is knowledge about pedagogy, learning practices and lesson planning, as well as appropriate methods to teach a material. PCK is important knowledge in the process of developing science literacy and the ability to transform teacher knowledge into the learning process as an agent of change, teachers should continue to develop their teaching process in the classroom and prospective teachers continue to train their skills in designing lessons, one of which is to understand PCK. Since PCK was introduced, many educational researchers have studied PCK, including science teachers(Brown et al., 2013; Van Driel, 2010). Their findings indicate that PCK is knowledge, experience, and expertise acquired through classroom experiences.

The Biology Education Study Program, Faculty of Teacher Training and Education, Universitas Muhammadiyah Metro is one of the LPTKs (Educational Staff Educational Institutions) with the main profile of graduates being prospective biology teachers. As a producer of biology teacher candidates, graduates of Biology Education, Faculty of Teacher Training and Education, Universitas Muhammadiyah Metro are expected to have competencies as stated in the Study Program Learning Outcomes, one of which is being able to apply specific pedagogy to teach biology concepts by considering the characteristics of the concept and pedagogy that are appropriate as the implementation of Pedagogical Content Knowledge (PCK). In order to obtain these work skills, prospective biology teacher students must at least have knowledge of: (1) biological concepts, principles, laws, and theories to be applied in learning biology in schools and in the community; and (2) philosophy of approaches, models, methods, and instructional media in order to carry out biology learning in schools and the community.

Based on the results of the preliminary study obtained from 15 prospective biology teacher students regarding the initial abilities that must be possessed to become teachers and the implementation of learning in science learning, in general 15 prospective teachers have no different opinion regarding the abilities that must be possessed to become a teacher, 11 people prospective teachers argued that becoming a teacher is not easy because the abilities that teachers need to have are not only content knowledge but also need to have other knowledge, namely pedagogy, while 4 prospective teachers argue that being a teacher is not difficult because the ability that needs to be possessed is only content knowledge. Opinions of 15 prospective teachers related to the implementation of learning in class, 6 of them argued that in the learning process there was a need for interaction between teachers and students so there was a need for learning methods that provoked active students in learning, while 2 prospective teacher students argued that in the implementation of teacher learning not only conveying the material but also educating students to behave well, and 7 prospective teacher students only thought that in the implementation of learning students must be active. Based on the results of the preliminary study, prospective teacher students already know the abilities that need to be possessed to become teachers and in the implementation of learning students must be active but still have not shown knowledge related to knowledge that combines content knowledge and pedagogy.

One way to analyze the PCK ability of prospective teachers is through filling out a document consisting of Content Representation (CoRe). CoRe is used as a document to analyze the PCK abilities of prospective teachers because it can make explicit the relationship between content knowledge, teaching and learning for science teachers (Hume, 2010; Loughran et al., 2012). The CoRe format is a table consisting of rows and columns. The top row represents "Main Ideas" which are intended to represent the main ideas and concepts that are in a particular science content area (Loughran et al., 2012). Based on expert opinion regarding CoRe, it can be said that through CoRe, prospective teacher students can plan activities in the learning process that match the content of the material being taught with their pedagogy. CoRe can make prospective teachers better prepared to teach material in terms of content and teach it.

Since the enactment of the new policy, namely the preparation of lesson plan Curriculum 2013 only contains KI and KD Attitude of Knowledge and Skills except for Religion and PPKn subjects which also contain KI and KD

for Spiritual and Social Attitudes, so it is necessary to develop a CoRe instrument to analyze the PCK of teachers in planning lessons. Therefore, in this study it is necessary to develop a CoRe instrument for Biology teacher candidates as an instrument for analyzing the PCK abilities of prospective Biology teacher candidates.

2. Method

This research is a type of research and development or Research and Development (R&D). In this study, the development of the CoRe Instrument was adopted from (Loughran et al., 2012) as an instrument for analyzing the ability of the Pedagogical Content Knowledge for Biology Teacher Candidates at Faculty of Teacher Training and Education, Universitas Muhammadiyah Metro. The development procedure carried out in this study according to (Borg & Gall, 1989) consists of the following steps:

1. R*esearch and information collecting*. Research and data collection includes preliminary studies. The preliminary study was carried out in two ways, namely needs analysis and literature study.

a. Needs Analysis

The needs analysis carried out was conducting a preliminary study by distributing questionnaires and interviews related to the abilities that must be possessed to become a teacher and the implementation of biology learning with 15 prospective teacher students who have taken the micro-teaching course at Faculty of Teacher Training and Education, Universitas Muhammadiyah Metro.

Table 1: Results of Preliminary Study Needs Analysis

No	Aspect	Teacher Candidate Response
1	The abilities a prospective teacher must have	a. 73,33% argues that prospective teachers need to have content and pedagogical abilities b. 26.67% argues that prospective teachers only need content skills
2	Implementation of learning in learning Biology	a. 40% argues that the Biology learning process has a two-way interaction with the right method b. 13,33% argues that in the learning process the teacher does not only teach but also educates student behavior c. 46,67% argues that in the implementation of student learning must be active.

b. Study of literature

In the literature study there are several theories about PCK according to experts including Lee S Shulman in his book entitled Knowledge and teaching: Foundation of the New Reform, and Magnusson, S., Krajcik, J., & Borko, H, in his book, Nature , sources, and development of pedagogical content knowledge for science teaching, while the theory of CoRe has several theories including Loughran, J., B. Amanda, & M. Pamela in his book Understanding and Developing Science Teacher's Pedagogical Content Knowledge 2nd Edition and Hume, A., & Berry, A. in their book Constructing CoRes - a strategy for building PCK in pre-service science teacher education.

2. Planning namely compiling an instrument development plan, including determining the main literature developed into a CoRe instrument, formulating objectives to be achieved by research, and determining the scope for developing the instrument.

a. Main Literature Determination

The main literature used as a reference for developing the CoRe instrument is as follows:

Table 2: Main Literature Details

No	Essential Concepts	Author	Main Literature
1	CoRe	Loughran, J., B. Amanda, & M. Pamela	*Understanding and Developing Science Teacher's Pedagogical Content Knowledge* 2nd Edition
2	PCK	Magnusson, S., Krajcik, J., & Borko, H	*Nature, sources, and development of pedagogical content knowledge for science teaching*

Apart from the two books, the main reference in this research is the RPS or Semester Learning Plan in the Micro Teaching course.

b. Formulation of Purpose

Based on the needs analysis that has been carried out, the purpose of this research is to produce a CoRe instrument that is able to measure the PCK ability of a Biology Teacher Candidate in order to maximize the PCK abilities possessed and to determine the Biology Teacher Candidate's response to the instruments that have been developed.

c. Scope of Development

The development of the CoRe instrument is a document that is developed from a teacher candidate's answer to a big idea related to how to teach the main idea. This CoRe instrument was made for Biology Teacher Candidates at Muhammadiyah Metro University.

3. Develop preliminary form of product. Product development begins with making the CoRe instrument grid to be developed and the Respondent Trial instrument.

a. Lesson Plan Analysis

Lesson Plan analysis begins by looking at the learning objectives, so that it can be seen the competencies that will be achieved in the learning. The core objective of micro teaching-learning is to provide provisions in the form of understanding concepts about education and subject matter, as well as training prospective teacher students to be skilled in applying learning concepts in actual learning activities.

Understanding educational concepts and subject matter can also be called PCK or Pedagogical Content Knowledge. To be able to see the PCK of prospective teacher students, a tool is needed that can measure how much the prospective teacher's understanding of educational concepts and subject matter. The instrument that can measure PCK is the CoRe instrument. CoRe is an instrument that provides an overview of how teachers conceptualize certain subject matter content.

b. CoRe Instrument Development criteria

Table 3: Instrument CoRe Criteria

Learning objectives	PCK components	Indicators Core Assessment	Item Number
Train and provide understanding to prospective teacher students so that they are able to plan	Orientation to teaching Science	The concept that students must master	1,2
		The reason the importance of the main idea is raised	3,4
	Knowledge of science curriculum	Material restrictions	5,6

learning/learning tools such as syllabus, Semester Programs, Annual Programs, RPP, LKS, Teaching Materials, Media and Assessment of student learning properly and correctly	Knowledge understands the ability of students in learning science	Students' initial knowledge	7,8
	Knowledge of learning strategies for teaching science	Difficulties and limitations in teaching	9,10
		Factors affecting learning	11,12
		Learning procedure	13,14
		Learning Media	15,16
	Knowledge of scientific assessment	How to assess student abilities	17,18
		Specific assessment of student understanding	19,20
	Total		**20**

The initial development of the CoRe instrument was to create a grid as described in the table above. This initial draft will be validated by expert lecturers to obtain instrument validation data. The results of the validation will be translated at the revision stage.

4. Validate product testing. Initial product validation was carried out with two test subjects, namely validation by education experts (2 people) and linguists (2 people) as many as 4 people. During the initial product trial, an assessment and comments and suggestions were made on the CoRe instrument. Each expert was given a draft of the CoRe instrument that was developed and a questionnaire containing the assessment and also the advice of each expert from education and language. Suggestions given by the validator will be reconsidered whether the instrument is revised or not, while if the four validators state that the aspects of the instrument are appropriate, there will be no revisions to those aspects.

5. Main product revision, namely improving or perfecting the test results.

6. Main product testing. Conducting trials in 1 group of micro-teaching with 10 test subjects. During the field trial, prospective teachers worked on the CoRe instrument that had been developed, then the results of the trial were analyzed from the aspects of language and education.

7. Operational product revision, namely perfecting the results of field tests.

8. Operational field testing. Conducted in 3 groups of micro-teaching involving 30 subjects. Testing was carried out through the CoRe instrument, interviews, and analysis of the results.

9. Final product revision. Improvements are based on input from field implementation tests.

10. Dissemination and implementation, namely reporting the results in professional meetings in submitting national journals.

3. Results

The data presented is in the form of an analysis of student response questionnaires related to the CoRe instrument. The CoRe instrument, which has been validated by education experts and linguists, is tested in small groups using a student response questionnaire seen from the educational and linguistic aspects. The subjects or samples in this test were 30 people in one micro teaching class.

a. Linguistic Aspects

This data provides information about student responses to the CoRe instrument in terms of language. The results of student response data processing are presented in Table 4 below:

Table 4: Student Response from Linguistic Aspects

Criteria	Frequency	%
Very High	21	70%
High	9	30%
Medium	0	0%
Low	0	0%
Very Low	0	0%

Based on table 4, the linguistic aspect of the student biology teacher-student response questionnaire to the CoRe instrument, which states that the language aspect is "very high" there are 21 students with a percentage of 70%, stating "high" there are 9 students with a percentage of 30%, while for the "medium "category No subject selected. ", " Low " and " very low ". From the results above, it can be interpreted that the student's response to the CoRe instrument from the linguistic aspect can be categorized into very high criteria with a percentage of 40%.

b. **Educational Aspect**

This data provides information about student responses to the CoRe instrument from an educational perspective. The results of student response data processing are presented in Table 5 below:

Tabel 5: Student Response from the Aspect of Education

Criteria	Frequency	Presentase
Very High	22	73,33%
High	8	26,67%
Medium	0	0%
Low	0	0%
Very Low	0	0%

Based on table 5, the educational aspect of the student response questionnaire of biology teacher candidates to the CoRe instrument, which states that the language aspect is "very high", there are 22 students with a percentage of 73.33%, stating "high" there are 8 students with a percentage of 26.67%, while for the category "medium", "low" and "very low" no subject chose. From the results above, it can be interpreted that the student's response to the CoRe instrument in the educational aspect can be categorized in very high criteria with a percentage of 70%.

4. Discussion

Based on the results of data analysis from various product trials that have been carried out, the results of the development of the CoRe instruments to analyze the PCK of biology teacher candidates with the subject of 30 biology teacher prospective students who are taking micro teaching courses at Universitas Muhammadiyah Metro, can be categorized by category good, but there are still some shortcomings that need to be revised to improve the quality of the CoReinstruments for the better. Some of the shortcomings were revised, including:

1. Linguistic aspects
   a. The style of presentation tends to be boring
   b. There are still words that are difficult to understand
2. Educational aspects
   a learning device, because it is limited by the scope of the material

Based on the results of product trials that have been carried out, the CoRe instrument and the one developed are considered to be quite good and can be used well by prospective biology teacher students at Faculty of Teacher Training and Education, Universitas Muhammadiyah Metro. The percentage value of the CoRe instrument from the language aspect was 60% and from the educational aspect was 70%.

References

Abbitt, J. T. (2011). Measuring Technological Pedagogical Content Knowledge in Preservice Teacher Education. *Journal of Research on Technology in Education*, *43*(4), 281–300. https://doi.org/10.1080/15391523.2011.10782573

An, S., Kulm, G., & Wu, Z. (2004). The Pedagogical Content Knowledge of Middle School, Mathematics Teachers in China and the U.S. *Journal of Mathematics Teacher Education*, *7*(2), 145–172. https://doi.org/10.1023/b:jmte.0000021943.35739.1c

Arends, R. I. (2007). Learning to teach: jilid dua (terjemahan). *Yogyakarta: Pustaka Pelajar*.

Borg, W. R., & Gall, M. D. (1989). Educational research: An introduction,(pp. 668-737). *White Plains, NY: Longman*.

Brown, P., Friedrichsen, P., & Abell, S. (2013). The Development of Prospective Secondary Biology Teachers PCK. *Journal of Science Teacher Education*, *24*(1), 133–155. https://doi.org/10.1007/s10972-012-9312-1

Calik, M., & Aytar, A. (2013). Investigating Prospective Primary Teachers' Pedagogical Content Knowledge of" Effect of Human on Environment" Subject in the Process of Teaching Practice. *Educational Sciences: Theory and Practice*, *13*(3), 1599–1605.

Hashweh *, M. Z. (2005). Teacher pedagogical constructions: a reconfiguration of pedagogical content knowledge. *Teachers and Teaching*, *11*(3), 273–292. https://doi.org/10.1080/13450600500105502

Hume, A. C. (2010). *CoRes as tools for promoting pedagogical content knowledge of novice science teachers*.

Kalpana, T. (2014). A constructivist perspective on teaching and learning: A conceptual framework. *International Research Journal of Social Sciences*, *3*(1), 27–29.

Loughran, J., Berry, A., & Mulhall, P. (2012). Pedagogical Content Knowledge. In *Understanding and Developing Science Teachers' Pedagogical Content Knowledge* (pp. 7–14). SensePublishers. https://doi.org/10.1007/978-94-6091-821-6_2

Nilsson, P. (2008). Teaching for Understanding: The complex nature of pedagogical content knowledge in pre-service education. *International Journal of Science Education*, *30*(10), 1281–1299. https://doi.org/10.1080/09500690802186993

NSTA Regional Meetings. (1964). *The American Biology Teacher*, *26*(6), 425. https://doi.org/10.2307/4440713

Rochintaniawati, D. (2010). *Analisis kebutuhan guru dalam mengembangkan kurikulum dan pembelajaran IPA di sekolah dasar*. Universitas Pendidikan Indonesia.

Turnuklu, E. B., & Yesildere, S. (2007). The Pedagogical Content Knowledge in Mathematics: Pre-Service Primary Mathematics Teachers' Perspectives in Turkey. *Issues in the Undergraduate Mathematics Preparation of School Teachers*, *1*.

Van Driel, J. (2010). Model-based development of science teachers' Pedagogical Content Knowledge. *International Seminar, Professional Reflections, National Science Learning Centre, York*.

Wilson, N. S. (2008). Teachers expanding pedagogical content knowledge: learning about formative assessment together. *Journal of In-Service Education*, *34*(3), 283–298. https://doi.org/10.1080/13674580802003540

The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 27-38
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.171

Learners' Perceptions of the Influence of Teachers' Nonverbal Communication on Their Aspirations to Pursue STEM Courses

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Abstract
This paper reports the results of a study that investigated secondary school learners' perceptions of the influence of their science and mathematics teachers' nonverbal communication on their aspirations to pursue Science, Technology, Engineering and Mathematics (STEM) related courses in institutions of higher learning. The study further investigated if there were gender differences in learners' perceptions. The nonverbal aspects of communication focused on were teachers' actions in class and their dressing and grooming. A sample of 465 form three secondary school learners was selected using stratified simple random sampling technique, out of whom 221 were female while 244 were male from Nakuru County, Kenya. Data was collected using a secondary school learner's questionnaire. The reliability of the questionnaire was estimated using Cronbach alpha and yielded a coefficient of 0.88. The findings show that learners' perceived their teachers' nonverbal communication moderately influences their aspirations to pursue STEM. However, the perception on the influence of maintaining eye contact when asking and responding to questions and being always clean and neat were high. Therefore, science and mathematics teacher education programs should enhance pre and in service teacher awareness of the effect of their nonverbal behaviour on their learners. The Teachers Service Commission which is the national teacher regulator and employer in Kenya should ensure that the policy guidelines on teachers' dressing and grooming are straightforwardly interpreted by all teachers and properly enforced.

Keywords: Learners' Perceptions, Science Teachers, STEM Courses, Teachers' Actions, Teacher Dressing and Grooming, Teacher Nonverbal Communication

1. Introduction

1.1 Introduction to the Problem

The 21st century demands skilled human resources in Science, Technology, Engineering and Mathematics [STEM] (Milaturrahmah et al., 2017). This is because the society unquestionably depends on science and technology (Sagan, 1994). According to Colman (2020), Science encompasses the systematic study of the structure and behavior of the physical and natural world through observation and experimentation, while technology is the application of scientific knowledge for practical purposes. This indicates that one cannot have technology without prior knowledge in science. Colman argues that science is a source of tools and techniques for more efficient engineering designs and knowledge base for evaluation on feasibility of designs. Mathematics on the other hand is a discipline that provides key tools to be used in understanding science technology and engineering. Therefore evolvement in science in all its branches requires close involvement and strengthening of mathematical enterprise (Reeves, 2015; Wright & Chorin, 1999). They further add that each area of science has its own unique features however, the different areas share common features that are often mathematical in nature.

According to the National Council of Education Research and Training [N.C.E.R.T], (2000), learning of science mainly enhances the spirit of enquiry, creativity and objectivity. Further they argue that science aims to nurture the ability to explore and seek solutions to problems related to the environment and daily life. This enables learners to acquire the necessary theoretical knowledge, practical and technological skills to enter the world of work. Fadzil and Saat (2014), argue that for any country to meet global challenges STEM should be implemented in schools from an early age so as to produce knowledgeable and a competent human resource with adequate ability and creativity to lead the country forward. In the Kenyan secondary school curriculum, learners take up chemistry, physics and biology as compulsory science subjects at the lower level. However, at the upper level, they choose a minimum of two sciences with mathematics being compulsory at all levels. At the end of secondary cycle, learners sit for the Kenya Certificate of Secondary Education (K.C.S.E) examination. Their performance in the sciences and mathematics are prerequisite for admission into STEM careers in post-secondary institutions and universities.

Kenya's vision 2030 envisages the country's expectations to become a middle-income economy (Government of Kenya [G.O.K], 2007). Through this vision, the country hopes to achieve advanced levels of scientific and technological development. To achieve this, the critical role of STEM is indispensable for any meaningful social-economic development of the country. This implies that it is critical to encourage more students to take up science-related subjects and perform well to enable them proceed to STEM careers in post-secondary institutions. However, Kenya National Examination Council [KNEC] (2018 & 2019) reports indicate continuous below average performance in sciences and mathematics as shown in Table 1.

Table 1: *K.C.S.E Students % Mean Score in Science Subjects*

		KCSE % Mean Scores		
Subject	**Gender**	**2018**	**2017**	**2016**
Mathematics	Female	24.23	23.54	18.25
	Male	28.55	27.29	23.08
	Total	26.44	24.48	20.78
Biology	Female	24.65	17.98	28.31
	Male	26.78	19.91	30.07
	Total	25.69	18.93	29.19
Chemistry	Female	25.68	22.55	22.69
	Male	28.02	25.45	24.65
	Total	26.88	24.05	23.71
Physics	Female	33.30	34.48	40.63
	Male	34.70	35.30	39.41
	Total	34.27	35.05	39.77

The results in Table 1 indicate that students' mean scores for the three years is below average. The continued below average learners' performance has prompted the Kenyan government through the Ministry of Education to

come up with measures to address the problem. One such measure started in 2004 to date is Strengthening of Mathematics and Sciences in Secondary Education (SMASSE) offered as an in-service program for secondary school science and mathematics teachers. SMASSE aims to improve learners' performance by having new approaches to teaching and at the same time enabling more learners to have a positive attitude towards sciences and mathematics (CEMASTEA, 2016). The Kenyan government through its tuition-free secondary education program is also providing science laboratory equipment and chemicals to all public schools (G.O.K, 2015a). This is meant to ensure all learner carry out practical activities to enhance learning and hence achievement. However, learners' performance has not improved and neither has the gender gap been narrowed.

All the above-mentioned initiatives have focused on improving of teaching methodologies and provision of laboratory facilities and equipment to schools with the aim of improving performance. These initiatives focus on the verbal aspects of communication ignoring the critical role that nonverbal communication plays in the teaching and learning process. However, despite the initiatives, the performance is still below average as indicated in Table 1. This shows that there could be other factors contributing to the poor performance. One of the factors could be the influence of science and mathematics teachers' nonverbal communication on learners. Hence the study sought to investigate learners' perceptions of their teachers' nonverbal communication and whether these perceptions influence their uptake of STEM courses in higher institutions of learning.

Nonverbal communication is any communication done without using words, rather it is the process of generating meaning using behavior. These include physical appearance, sounds, gestures, body movement, eye contact, facial expressions, pitch or tone of a voice, spatial distance, postures and dressing of an individual (Bunglowala & Bunglowala, 2015; Babad, 2007; Gamble & Gamble, 2002). According to Jones (2006), 55% of the first impression of a teacher's professionalism is derived from appearance, 35% from the voice and 7% from what they say. This is supported by Guerrero and Floyd (2006), who argue that more meaning is generated from nonverbal than verbal communication indicating its critical role in communication. Further, Muchemwa (2013) points out that nonverbal communication is one of the tools that is ordinary but is greatly important for teaching, instruction and classroom management.

Neill (1989) reiterates that facial and eye expressions and body movement play pivotal roles in both lesson delivery and class management. A study by Falemeh et al. (2014) found that teachers' facial expression and eye contact played a fundamental role in learners' learning of language and active class participation. Nonverbal communication influences learners' attitude towards a teacher which in turn influences their level of class participation and finally their performance in the subject (FWF Austrian Science Fund, 2016; Kashem, 2019; Verma & Chandel, 2015). This indicates that teachers' nonverbal communication plays a critical role in teaching and learning. This could influence learners' attitudes towards science and mathematics subjects and hence their performance.

Carr et al. (2009) argue that clothing has communication power, since an attire of a teacher projects an image that influences the mind and attitude of students before teaching. Therefore, a teacher's influence as a source of knowledge and as a mentor may be dependent upon how a teacher's attire is perceived. According to Slepian et al. (2015), the type of clothing and fashion a teacher wears influences largely and affects the learners' processing style that changes how objects, people and events are interpreted. They note that teachers' formal dressing like suits contribute to learners' higher cognition and abstract thinking. This makes one to feel more important and powerful leading to their thinking in the same direction. This assertion is supported by Sampson (2016) in his study on teachers' perceptions of the effect of their attire on middle school learners' behavior and learning in rural Georgia school. The study's findings indicate that teachers' perceived that their professional attire had a positive influence on learners' learning and behavior and that learners' appear to model teachers' who are professionally attired. Teachers' appearance can affect the attitude of students and also the respect they give to their teachers (Jewell, 2010).This is supported by Dasgupta (2014), who notes that student motivation is the element that leads learners' attitude towards deciding their career goal.

From the foregoing discussion, it is evident that nonverbal communication of teachers plays a critical role in motivating learners to learn and excel in their academic performance in order for them to pursue STEM in

institutions of higher learning. However, there is minimal documentation on how learners perceive their science and mathematics teachers nonverbal communication and if it influences their aspirations to pursue STEM in institutions of higher learning. Hence this study investigated secondary school learners' perceptions of the influence of their Science and Mathematics teachers' non-verbal communication on their aspirations to pursue STEM courses and whether there are any gender differences. The study focused on two non-verbal aspects which were, teachers' actions in class and their dressing and grooming. In this study, teachers' actions in class refer to what they do and how they act in class as they interact with their students. Teachers' dressing refer to the type and nature of clothing while grooming refer to the appearance in terms cleanliness and neatness of the face, hair, clothes and shoes while within the school environment.

1.2 Objectives of the Study

The general objective of the study was to investigate secondary school learners' perceptions of the influence of their Science and Mathematics teachers' non-verbal communication on their aspirations to pursue STEM courses. Further, the study sought to find out if there are gender differences in the learners' perceptions.

The study was guided by the following specific research objectives,

(1) To find out secondary school learners' perceptions of the influence of their Science and Mathematics teachers' actions in class on their aspirations to pursue STEM courses.

(2) To find out secondary school learners' perceptions of the influence of their male Science and Mathematics teachers' dressing and grooming on their aspirations to pursue STEM courses.

(3) To find out secondary school learners' perceptions of the influence of their female Science and Mathematics teachers' dressing and grooming on their aspirations to pursue STEM courses.

1.3 Hypotheses of the Study

The study was guided by the following null specific hypotheses,

H_O1: There is no statistically significant difference in secondary school learners' perceptions of the influence of their Science and Mathematics teachers' actions in class on their aspirations to pursue STEM courses by gender.

H_O2: There is no statistically significant difference in secondary school learners' perceptions of the influence of their male Science and Mathematics teachers' dressing and grooming on their aspirations to pursue STEM courses by gender.

H_O3: There is no statistically significant difference in secondary school learners' perceptions of the influence of female Science and Mathematics teachers' dressing and grooming on their aspirations to pursue STEM courses by gender.

2. Methodology

The research employed cross-sectional descriptive survey design. This allowed for data collection at one point in time within a short period of time (Gall et al., 2007). The target population comprised of public secondary school learners from Nakuru East and West sub-counties of Nakuru County, Kenya. The accessible population comprised of form three learners since at this level they have selected at least two sciences as per the 8-4-4 curriculum requirements. A sample size of 384 is recommended for a survey where the population is large and at 95% confidence level and 5% margin error (Cochran, 1977; Kathuri & Pals, 1993). However, Goodrich and St. Pierre (1979), recommended increment of the calculated sample size by 20% to take care of attrition and non-response, giving an extra 81 respondents. Hence the sample size increased by 81 giving a total of 465. A sample size of 465 learners (221 female and 244 male) was selected using stratified simple random sampling technique based on gender and school type (single and mixed sex schools).

The secondary school students' questionnaire was used to collect data on learners' perceptions of the influence of their Science and Mathematics teachers' nonverbal communication on their aspirations to pursue STEM courses at institutions of higher learning. To take care of ethical issues, the questionnaire in its opening remarks assured

learners that the information they will provide will only be used for research purposes and their participation in the study was voluntary. They were also not required to identify themselves to ensure respondents confidentiality.

The questionnaire had two sections with section two having three parts. Section one solicited for general information. Section two-part one solicited information on learners' perceptions of the influence of their teachers' actions in class. They indicated the extent to which they felt encouraged by each specific teachers' action. Part two and three solicited information on the perception of the influence of their teachers' dressing and grooming for male and female teachers respectively. They indicated the extent to which they felt encouraged by each specific item on dressing and grooming. The perceived extent of influence ranged from a scale of 0 to 4 where a score of 4 indicated a very high extent of influence while 0 indicated no influence. The three parts had 13, 16 and 17 items respectively which were Likert type.

The Questionnaire was validated for content by 5 experts in education and psychology from XXX. The instrument was then piloted in two secondary schools of the neighboring Njoro Sub County. Cronbach's alpha was used to estimate the reliability of the instrument. This yielded a reliability coefficient of 0.88. This was within the accepted threshold of at least 0.7 (Gall et al., 2007). The questionnaire was self-administered to the sampled learners to ensure a higher return rate.

3. Results

The first objective of the study was to find out secondary school learners' perceptions of the influence of their Science and Mathematics teachers actions in class on their aspirations to pursue STEM courses. Learners indicated their perceived extent to which the teacher actions encouraged them to pursue STEM courses in higher education institutions. Further analysis was done to establish if gender differences in learners' perceptions existed. The results are presented in Table 2.

Table 2: *Mean and SD of the Perceived Extent to which Teachers' Actions in Class Encourage Learners to Pursue STEM Courses by Gender*

When my science or mathematics teacher,	**Female N= 221**		**Male N=244**		**Total N=465**	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Smiles at me while accepting my ideas	1.96	1.22	1.92	1.00	1.94	1.12
Frowns while disapproving my ideas	0.72	1.10	0.87	1.24	0.80	1.17
Maintains eye contact while asking me questions	2.85	1.28	2.74	1.19	2.80	1.23
Maintains eye contact when I respond to questions	2.79	1.25	2.60	1.17	2.69	1.21
Varies his/her tone while teaching	2.08	1.34	2.13	1.24	2.10	1.29
Varies his/her pace of talk when teaching	1.83	1.30	1.97	1.18	1.91	1.23
Moves away when rejecting my ideas	0.45	1.00	0.61	1.06	0.53	1.03
Moves towards me when I am responding to a question	2.03	1.46	2.03	1.37	2.03	1.41
Nods his/her head up and down when accepting my response/ideas.	2.40	1.48	2.11	1.43	2.25	1.46
Shakes his/her head sideways when rejecting my response/ideas.	1.13	1.35	1.38	1.36	1.26	1.36
Varies his/her gestures while teaching	2.59	1.30	2.30	1.18	2.44	1.24
Body language when giving directions encourages my	2.98	1.34	2.73	1.19	2.86	1.27

participation in seeking clarifications						
Index	**1.91**	**0.60**	**1.87**	**0.55**	**1.89**	**0.57**

The results in Table 2 indicate that learners perceive that teachers actions in class does influence their aspirations to pursue STEM courses though moderate (M = 1.89). In addition, the overall mean for female learners (M= 1.91) is higher than their male counterparts (M= 1.87). This implies that the perceptions on the extent of influence of teachers' actions in class on female learners' aspirations to pursue STEM is higher than that of male learners. The results also show that the overall mean for the items 'maintaining of eye contact when asking and responding to questions' is high (M = 2.80 and 2.69 respectively) Female learners had higher means on the two items compared to male learners (M = 2.85 and 2.79 for females and 2.74 and 2.60 for male learners respectively).

Further, items 'moving away when rejecting learners' ideas' and 'frowning while disapproving their responses' had the lowest means of 0.53 and 0.80 respectively. Both male and female learners had their lowest means on the two items (Female =0.45 and 0.72, males= 0.61 and 0.87 respectively). Similarly, female learners mean scores on the same items were lower than for male learners. This indicates that perceptions on the extent of influence to pursue STEM courses by majority of learners on these teachers' actions is minimal. This points to learners being discouraged by these specific teachers' actions with more effect on female learners.

Further, t-test statistics were computed to establish if the mean differences between the female and male learners were statistically significant. The results indicate that there were statistically significant gender differences in the following items ; 'The science teacher nods his/her head up and down when accepting my response/ideas'($t(454)= 2.131$ $p< .05$), 'The science teacher varies his/her gestures while teaching'($t(432)= 2.434$, $p<.05$) and 'The science teachers' body language when responding to questions/inquiries'($t(447)= 2.099$ $p<.05$). The statistically significant gender differences were all in favor of females. Item on 'The science teacher shakes his/her head sideways when rejecting my response/ideas' was statistically significant ($t (449) = 1.964$ $p< .05$) in favor of male learners. The gender difference in all the other items including the overall mean on teacher actions in class were not statistically significant. This indicates that the perception on the extent of influence in the specific teacher actions were similar for both male and female learners.

The second objective of the study was to find out secondary school learners' perceptions of the influence of their Male Science and Mathematics teachers' dressing and grooming on their aspirations to pursue STEM courses. Learners indicated their perceived extent to which the specific items on dressing and grooming encouraged them to pursue STEM courses in higher education institutions. Further analysis was done to establish if gender differences in learners' perceptions existed. The results are presented in Table 3.

Table 3: *Mean and SD of the Perceived Extent to which Male Science Teachers' Dressing and Grooming Encourage Learners to Pursue STEM Courses by Gender*

	Female N=221		**Male N=244**		**Total N=465**	
When my male science or mathematics teacher,	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Dress formally (puts on a suit and tie)	1.77	1.37	1.36	1.37	1.57	1.39
Wears sports shoes when teaching	0.49	1.04	0.30	0.86	0.39	0.95
Clothes are always wrinkled	0.44	1.03	0.57	1.12	0.50	1.08
Clothes are always pressed	2.12	1.56	1.71	1.56	1.91	1.57
Hair is well-groomed	3.09	1.27	3.23	1.07	3.16	1.17
Matches suit, tie and shoes	1.75	1.55	1.58	1.43	1.67	1.49
Wears cologne/perfume	1.37	1.42	1.17	1.23	1.26	1.33
Puts on laboratory coat even when not in class	2.21	1.57	1.81	1.58	2.00	1.58
Puts on a clean laboratory coat	3.24	1.14	3.09	1.27	3.16	1.21
Puts on a pressed laboratory coat	1.72	1.64	1.44	1.43	1.58	1.54
Wears very tight clothes	0.57	1.14	0.61	1.17	0.59	1.15
Is always neat	3.36	1.06	3.26	1.15	3.31	1.11

Is always clean	3.36	1.07	3.33	1.12	3.35	1.09
Comes to class drunk	0.12	0.59	0.18	0.73	0.15	0.67
Smells alcohol	0.14	0.65	0.22	0.81	0.18	0.73
Smells of cigarettes/other substances	0.09	0.56	0.12	0.62	0.11	0.59
Index	**1.55**	**0.45**	**1.43**	**0.47**	**1.49**	**0.46**

The results in Table 3 indicate that learners perceive that male teachers dressing and grooming does influence their aspirations to pursue STEM courses though moderate (M= 1.49). In addition, female learners have a higher mean (M= 1.55) than male learners (M= 1.43). This means that the perception on the extent of influence of male teachers dressing and grooming on female learners aspirations to pursue STEM courses is higher than that of male learners. The results also indicate that being clean followed by neat, well- groomed hair and putting on a clean laboratory coat had the highest means (M= 3.35,3.31, 3.16 and 3.16 respectively). The same trend is observed for each gender. These results show that both male and female learners are positively influenced by these male teachers' aspects of dressing and grooming. Smelling of cigarettes and other substances, alcohol, going to class drunk had the lowest means (M= 0.11, 0.18 and 0.15 respectively). This shows that the perception of the extent of influence of these aspects of male teachers' dressing and grooming is low.

To determine whether there were statistically significant gender differences in learners' perceptions, t-test was calculated. The results indicate that there were statistically significant gender differences in the overall mean $t(456) = 2.778$, $p < .05$ in favor of female learners. This shows that the perception of female learners on the extent of influence of male teachers' dressing and grooming's to pursue STEM courses is higher than that of male learners.

Statistically significant gender differences was observed in the following items; Dresses formally (puts on a suit and tie) ($t(444=3.123$, $p<.05$), Wears sports shoes when teaching ($t(443) = 2.129$, $p<.05$), Clothes are always pressed ($t(419) =2.688$, $p<.05$) and Puts on laboratory coat even when not in class ($t(442) = 2.717$, $p<.05$). These gender differences were all in favor of female learners. This shows that these aspects of male teachers 'dressing and grooming's extent of influence on female learners to pursue STEM courses is higher than that of male learners.

The third objective of the study was to find out secondary school learners' perceptions of the influence of their Female Science and Mathematics teachers dressing and grooming on their aspirations to pursue STEM courses. Learners indicated their perceived extent to which the specific items on dressing and grooming encouraged them to pursue STEM courses in higher education institutions. Further analysis was done to establish if gender differences in learners' perceptions existed. The results are presented in Table 4.

Table 4: *Mean and SD of the Perceived Extent to which Female Science Teachers' Dressing and Grooming Encourage Learners to Pursue STEM Courses by Gender*

	Female N=221		**Male N=244**		**Total N=465**	
When my female science or mathematics teachers	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Dresses formally	2.85	1.24	2.64	1.35	2.74	1.30
Wears sports shoes/sandals when teaching	0.46	1.09	0.54	1.02	0.50	1.05
Clothes are always wrinkled	0.39	0.95	0.49	1.04	0.44	0.99
Clothes are always pressed	2.06	1.62	1.88	1.51	1.97	1.56
Hair is well-groomed	3.25	1.07	3.15	1.11	3.20	1.09
Matches clothes with shoes	2.27	1.35	2.25	1.40	2.27	1.38
Wears perfumes	1.71	1.35	1.84	1.42	1.77	1.38
Puts on Laboratory coat even when not in class	2.07	1.58	1.57	1.54	1.82	1.58
Puts on a clean laboratory coat	3.08	1.31	3.00	1.20	3.04	1.25
Puts on a pressed laboratory coat	1.84	1.69	1.66	1.47	1.76	1.58
Wears very tight clothes	0.79	1.25	1.03	1.41	0.91	1.34
Wears very short clothes	0.90	1.39	0.97	1.41	0.93	1.40

Is always clean	3.48	0.93	3.30	1.04	3.39	0.99
Is always neat	3.39	1.08	3.45	0.94	3.42	1.00
Comes to class drunk	0.05	0.40	0.14	0.70	0.10	0.57
Smells alcohol	0.05	0.40	0.11	0.57	0.08	0.49
Smells cigarettes/other substances	0.06	0.42	0.04	0.39	0.05	0.40
Index	**1.61**	**0.48**	**1.58**	**0.46**	**1.60**	**0.47**

Table 4 results indicate that learners perceive that female teachers dressing and grooming does influence their aspirations to pursue STEM courses though moderate (M=1.60). Likewise, male and female learners overall mean is also moderate with that of female being higher than that of male learners (M =1.61 and M = 1.58, respectively). This shows that the perception on the extent of influence of female teachers dressing and grooming on learners aspirations to pursue STEM courses is moderate. Further, the results indicate that the following items had the highest means; being neat (M = 3.42), clean (M = 3.39), well-groomed hair (M = 3.20) and putting on a clean laboratory coat (M = 3.04). This indicates that the perception on the extent of influence of these three aspects of female teachers dressing and grooming have a greater influence on learners' aspirations to pursue STEM courses. The same aspects of dressing and grooming had the highest means for both male and female learners with an exception of the item 'always neat' being higher among male learners.

Table 4 results also show that the following items had the lowest overall mean and also for both male and female learners; 'coming to class drunk' and 'smelling of cigarettes and other substances' have the lowest mean scores. This indicates that the perception on the extent of influence of these aspects of female teachers dressing and grooming is extremely low among all learners.

Further, t-tests were calculated to determine if there were any statistically significant gender differences in the mean perceptions scores. The results indicate that there was a statistically significant difference in only one item which was 'putting on a lab coat even when not in class' ($t=3.363$ $p=0.001$)) in favor of female learners. This implies that when female teachers put on a laboratory coat even when not in class makes them similar in appearance bringing out the concept of uniformity. Hence the issue of differences in dressing is covered up by the laboratory coat. However, the overall mean difference and all the other specific items means were not statistically significant. This indicates similar perception on the extent of influence in both male and female learners.

4. Discussion

The results presented in Table 2 have shown that the perception on the influence of teachers' actions in class on learners' aspirations to pursue STEM courses in institutions of higher learning is present but moderate (M=1.89). The same trend was observed in both male and female learners with the perception on the extent of influence being higher in females though not statistically significant. However, the following specific teacher actions had a higher perception on the extent of influence; Body language when giving directions encourages my participation in seeking clarifications, Maintains eye contact while asking me questions and Maintains eye contact when I respond to questions. The findings are supported by Neil (1989) who reiterates that facial and eye expressions and body movement play pivotal roles in both lesson delivery and class management. Body language has the power to transfer the attitudes and feelings of people to others and can be more effective than verbal language (Bambaeeroo & Shokrpour, 2017; Farhangi, 1995). A project supported by the FWF Austrian Science Fund and headed by Bernd Hackle, explored the implication of nonverbal communication during classroom interaction found that teachers' body language gives them credibility and define whether the learning process will be nurtured or not (FWF Austrian Science Fund, 2016). This is supported by Guerrero and Floyd (2006), who posit that more weight is put on one's nonverbal communication when determining a person's credibility, while eye contact indicate a willingness to communicate or learn (Grubaugh, 1989). Lack of eye contact might show lack of teachers' interest in the learners' questions and responses thereby negatively influencing their attitudes towards the subject and in the long run their aspirations to pursue STEM. Montague et al. (2013), found that doctors who make a lot of eye contact were viewed better. This is further supported by a study by Falemeh et al. (2014), who found that teachers' facial expression and eye contact played a fundamental role in learners' learning of language and active class participation. Verma, and Chandel (2015) noted that teachers' eye contact with learners reduces their academic

anxiety hence encouraging active participation in classroom activities. This indicates that the teachers 'nonverbal communication plays a critical role in teaching and learning and could influence learners' attitude towards science and mathematics and hence their performance.

The items 'moving away when rejecting learners' ideas and 'frowning while disapproving their responses' had the lowest extent of influence on learners' aspirations to pursue STEM. The same trend was observed for both female and male learners. However, it was lowest for female learners and the difference was statistically significant in favor of females. This implies that this teacher action negatively affect the students and more so the female learners. According to Richard and Mc Crokey's (2004), some particular body signals are significant to women while others are only significant to men. This indicates that such teacher actions should be avoided in class.

The results indicate that the learners perceived influence of male and female teachers dressing and grooming's on their aspirations to pursue STEM is present and moderate with that of female learners being higher. However, the mean differences were statistically significant in the case of male teachers dressing and grooming in favor of female learners. This implies that the perception on male teachers' dressing and grooming influence on female learners is higher than in their male counterparts. However, according to Slabbert (2019) findings, there were no gender differences in learners' perceptions of their lecturers' attire.

Some aspects of teacher dressing and grooming had very high perception on the extent of influence but were not statistically different for both male and female learners. These aspects were being clean, neat, having well-groomed hair and putting on a clean laboratory coat. This shows that both male and female learners had similar perception on the extent of influence in the named aspects. These findings are in agreement with those of Smith and Larry (2015), who found that grooming and dress ranked highest in terms of contributing to effective delivery of information to an audience. Yang (2017), argues that the teachers' appearance is the first impression to students. He further posits that, students preferences of subjects always begin with the good will and admiration of teachers. According to the Teachers Service Commission teachers' code of conduct and ethics regulations (Government of Kenya, 2015b), a teacher should maintain a neat and decent standard of dressing which befits the dignity and image of the teaching service. Further, a teacher should ensure their appearance and personal hygiene is not offensive to workmates and those they serve.

The aspects of dressing formally, putting on pressed clothes and lab coat even when not in class by male science teachers had a statistically significant influence in favor of female learners. Phillips and Smith (1992), found that students' perceptions of teachers attributes are affected by teachers' attire. Further, they found that casual clothing was perceived by students to express teacher friendliness, fairness and interestingness while moderate attire expressed teachers' friendliness, organization, interestingness, understanding and discipline. Learners perceived that teacher organization, knowledge and disciplinary skills were conveyed by teachers' conservative dress. However the learners' perceptions did not differ by gender. This argument is supported by Slapian et al. (2015), who note that although formal clothing is associated with more professionalism, it enhances social distance. This can lead to teacher becoming less approachable hence making learners shy away from them. This indicates the need for teachers to adopt moderate formal dressing.

The findings are further, supported by Morris et al. (1996) study, which found that female students associated more formal dress with increased ratings of instructor competence. However, a study by Joseph (2017) also found no statistically significant differences in secondary students' perceptions of their teachers' professional attire. Kashem (2019) found that teachers' dressing had significant and direct effect on both student attitude and learning. He further notes that students give more respect to a teacher who appears in formal attire. Therefore this implies that if students have a positive outlook of a teacher they will tend to respect him/her and develop positive attitudes towards him/her. Manombe (2009) points out that the dress of a teacher is associated with a person's character, dedication, mood and behavior.

The perceived influence of some aspects such as going to class drunk and smelling of alcohol, cigarettes and other substances was very low. According to Rukundo and Magambo (2013), excessive teacher use of alcohol leads to job inefficiency that causes learners to lose confidence and respect for the teacher. Consequently, the learners

develop negative attitudes leading to poor academic performance. This indicates that for teachers to be good role models, they should avoid excessive use of these substances that causes them to smell even when not immediately used especially within the school environment.

5. Conclusions and Recommendations

In conclusion, the perception on the extent of influence of teacher actions in class on learners' aspirations to pursue STEM courses in institutions of higher learning is moderate. However, teacher actions like maintaining eye contact with learners, accepting their responses through nodding and walking towards them should be highly encouraged. Teacher actions that show disapproval of learners' responses by walking away and shaking of head sideways should be discouraged. This indicate rejection that lead to development of negative attitudes towards the teacher and subject hence poor academic performance. This implies that for teachers to encourage more learners to pursue STEM, they need to be aware of the impact of their actions in class and practice more of actions that influences learners positively in their teaching. Therefore, Science and Mathematics teacher education programs should enhance pre and in service teacher awareness of the effect of their nonverbal behavior on their learners.

On teachers' dressing and grooming, learners perceptions on the extent of their influence to pursue STEM was also moderate. However being neat, clean, well-groomed hair and putting on a clean laboratory coat had a higher influence on learners and hence should be encouraged among teachers. Smelling of alcohol, cigarettes and other substances had no positive influence on learners and hence should be highly discouraged. From the findings, there was significant gender differences in learner perceptions of male science teachers dressing and grooming in favor of females. In particular the difference was noted in the aspect of dressing formally. This could be an indication of female learners' keenness on their male teachers dressing. More studies need to be conducted to establish the reasons behind this finding. The Teachers Service Commission that acts as a regulator and employer of teachers in Kenya should come up with clear policies on teachers' dressing and grooming. The policies should communicate clearly to all teachers to allow for proper interpretation, implementation and enforcement.

6. Limitations and Recommendations for Further Study

One of the limitation of the study is on the sample used. The sample used was drawn from public secondary school learners in Nakuru East and West Sub Counties of Nakuru County which are mainly urban and highly cosmopolitan. This implies that the findings of the study can only be generalized to counties and schools that have similar characteristics. Therefore, there is need to investigate the influence of culture on the extent of learners perceptions between learners brought up in cosmopolitan areas and those brought up in rural areas and whether the effect of culture has been diluted in urban or highly cosmopolitan areas. According to Matsumoto and Hwang (2013); Weisbuch and Ambady (2009), culture influences nonverbal behavior.

The study examined perceptions rather than actual behavior, therefore students might not accurately recall the degree to which teachers used certain nonverbal behaviors especially if they rated them a year or more ago. However, this study has likely taped into how students think a best or worst teacher communicates. Future studies should employ innovative procedures to find unprejudiced measures of communicative behavior and see how they relate with perceptions of teaching effectiveness.

References

Babad, E. (2007). Teachers' Nonverbal Behavior and its Effects on Students. In J.C Smart (Ed.), *Higher Education: Handbook of Theory and Research, Vol. XXII, 219-279.* Springer. *https://static1.squarespace.com/static/52aa1677e4b069d1317f42d0/t/5a00dadc085229b51decb2b7/1510005470962/OMeara+%282007%29+Striving+for+what.pdf*

Bambaeeroo, F., & Shokrpour, R. (2017). The Impact of Teachers Non-verbal Communication on Success in Teaching. *Journal of Advances in Medical Education and Professionalism, 5(*2), 51-59. *https://jamp.sums.ac.ir/article_40986.html*

Bunglowala, A., & Bunglowala, A. (2015). Non-verbal communication: An integral part of teaching learning process. *International Journal of Research in Advent Technology Special Issue 1st International Conference on Advent Trends in Engineering. Science and Technology 8 Maret "ICATEST 2015",* 371-375.

Carr, D. L., Davies, T. L., & Lavin, A. (2009). The Effect of Business Faculty Attire on Student Perception of the Quality of Instruction and Program Quality. *College Student Journal,* 43(1), 45-56. https://eric.ed.gov/?id=EJ872213

Centre for Mathematics, Science and Technology Education in Africa (CEMASTEA), (2016).*Communication Policy and Procedures*. CEMASTEA

Cochran, W. G. (1977). *Sampling technique (3rd edition).* John Wiley and Sons. https://www.wiley.com/en-us/Sampling+Techniques%2C+3rd+Edition-p-9780471162407

Colman, A. M. (2020). A Dictionary of Psychology (4th Ed). OXFORD University Press. https://www.oxfordreference.com/page/scienceandtech/science-and-technology

Dasgupta, A. D. (2014). *Influence of Teachers on Motivation of Students for Career Development in Academics.* www.grin.com/document/279809

Fadzil, H. M., & Saat, R. M. (2014). Enhancing STEM Education during School Transition: Bridging the Gap in Science Manipulative Skills. *Eurasia Journal of Mathematics, Science & Technology Education,* 10(3), 209-218. https://doi.org/10.12973/eurasia.2014.1071a

Fatemeh, B., Samaneh, B., & Ali, A. K. (2014). An investigation of students' attitudes and teachers' nonverbal interaction in Iranian EFL classrooms. *International Journal of Language and Linguistics,* 2(6), 13-18. http://www.sciencepublishinggroup.com/journal/paperinfo.aspx?journalid=501&doi=10.11648/j.ijll.s.2014020601.13

Farhangi, A. (1995). *Human Relationship*. 17th Ed. Rassa Publishers.

FWF Austrian Science Fund. (2016).*The Role of Body Language in Teacher-Student Interactions.*https://phys.org/news/2016-09-role-body-language-teacher-student-interactions.html

Gall, P. G., Gall, M. D., & Borg, W. R. (2007). *Educational Research. An Introduction* (8th ed.), Pearson Education Inc.

Gamble, T. K., & Gamble, M. W. (2002). *Communication Works*. McGraw Hill Publisher.

Government of Kenya. (2007). *Kenya Vision 2030. A Globally Competitive and Prosperous Kenya.* Government Printers.

Government of Kenya (2015a). *Ministry of Education, Science and Technology (MOEST). National Education Sector Plan. Vol.1 Basic Education Programme, Rationale and Approach 2013-2018. https://planipolis.iiep.unesco.org/sites/planipolis/files/ressources/kenya_nesp_vol_1.pdf*

Government of Kenya (2015b). *The T.S.C Code of Conduct and Ethics for Teachers Regulations Kenya Gazette Supplement No. 126*. http://kenyalaw.org/kl/fileadmin/pdfdownloads/LegalNotices/162-Teachers_Service_Commission__Code_of_Conduct_and_Ethics_for_Teachers__Regulations__2015.pdf

Goodrich, R. L., & St. Pierre, R. G. (1979). *Opportunities for studying later effects of follow through.* ABT Associates.

Grubaugh, S. J. (1989). Non-verbal language techniques for better classroom management and discipline. *High School Journal,* 73(1), 34-40.

Guerrero, L. K., & Floyd, F. (2006). *Nonverbal communication in close relationships*. Lawrence Erlbaum https://www.academia.edu/36261723/Laura_K_Guerrero_Kory_Floyd_Nonverbal_Communication_in_Close_Relationships_pdf

Jones, S. (2006). No way to face a class of students. *Times Educational Supplement, 2*. https://www.tes.co.uk/article.aspx?storycode=2193353

Joseph, S. (2017). Student Perceptions of Teacher professional Attire. *Journal of Education and Human Development,* 6 (2), 31-41. https://doi.org/10.15640/jehd.v6n2a4

Jewell, M. (2010). *What happened to role models in our schools?* http://www.examiner.com/article/what-happened-role-models-our-schools

Kashem, M. A. (2019). The Effect of Teachers' Dressing on Students' Attitude and Student Learning: Higher Education View. *Education Research International,* 2019. https://doi.org/10.1155/2019/9010589

Kathuri, N. J., & Pals, D.A. (1993). *Introduction to Educational Research*. Egerton University: Educational Media Centre.

Kenya National Examination Council [KNEC], (2018). *The year 2016-2017 Kenya Certificate of Secondary Examinations (KCSE) Candidates Performance Reports*. KNEC.

Kenya National Examination Council [KNEC], (2019). *The year 2017-2018 Kenya Certificate of Secondary Examinations (KCSE) Candidates Performance Reports*. KNEC.

Manombe, N. (2009). *Effects of verbal and nonverbal Communication at Solusi University: A socio-Linguistic Approach* (Unpublished BA Research Project). Solusi University.

Matsumoto, D., & Hwang, H. S. (2013). Cultural influences on nonverbal behavior. In D. Matsumoto, M. G. Frank, & H. S. Hwang (Eds.), *Nonverbal communication: Science and applications* (pp. 97–120). Sage Publications, Inc. https://doi.org/10.4135/9781452244037.n5

Milaturrahmah, N., Mardiyana, M., & Pramudya, I. (2017). Mathematics Learning Process with Science, Technology, Engineering, Mathematics (STEM) Approach in Indonesia. *Journal of Physics Conference Series* 895(1):012030. https://iopscience.iop.org/article/10.1088/1742-6596/895/1/012030

Montague, E., Chen, P., Xu, J., Chewning, B. & Barrett, B. (2013). Nonverbal Interpersonal Interactions in Clinical Encounters and Patient Perceptions of Empathy. *Journal of Participatory Medicine*. 5:e33 https://participatorymedicine.org/journal/evidence/research/2013/08/14/nonverbal-interpersonal-interactions-in-clinical-encounters-and-patient-perceptions-of-empathy/

Morris,T. L., Gorham, S. H., Cohen, S. H., & Huffman, D. (1996). Fashion in the Classroom: Effects of Attire on Student Perceptions of Instructors in College Classes. *Communication Education,* 45 (2), 135-148. https://doi.org/10.1080/03634529609379043

Muchemwa, S. (2013). Use of Non-verbal Communication in the Classroom Teaching: A Case Study of Solusi High School, Zimbabwe. *Procedia- Social Behavioral Science, 103(2013), 1279-1287*. https://doi.org/10.1016/j.sbspro.2013.10.457

National Council of Education Research and Training [N.C.E.R.T]. (2000).*National Curriculum Framework for School Education.* NCERT. http://ctegujarat.org/Downloads/NCF%20Secondary%20Education-2000.pdf

Neill, J. (1989). The Effects of Facial Expression and Posture on Children's Reported Responses to Teacher Nonverbal Communication. *British Educational Research Journal,* 15 (2), 195-204. https://doi.org/10.1080/0141192890150207

Phillips, P.A., & Smith, L.R. (1992). *The Effect of Teacher Dress on Student Perceptions.* https://www.semanticscholar.org/paper/The-Effect-of-Teacher-Dress-on-Student-Perceptions.-Phillips-Smith/e6cc1b900ee0dab346c220471adaa0d9f56db72c

Reeve, E. M. (2015). STEM Thinking! *Technology and Engineering Teacher*, 75 (4), 8-16 https://eric.ed.gov/?id=EJ1047255

Richmond, V. P., & Mc Croskey, J. C. (2004). *Nonverbal Behavior in Interpersonal Relations,* (5th ed.). Allyn & Bacon.

Rukundo, A., and Magambo, J. (2013), Professional Impotence: Impact of Alcoholism on Secondary School Teachers in Uganda. *International Journal of Alcohol and Drug Research (IJADR),* 2(2), 69-74. https://doi.org/10.7895/ijadr.v2i2.104

Sagan, C. (1994, January 9). With Science on our Side. *Washington Post.* https://www.washingtonpost.com/archive/entertainment/books/1994/01/09/with-science-on-our-side/9e5d2141-9d53-4b4b-aa0f-7a6a0faff845/

Sampson, E. C. (2016). *Teachers' Perceptions of the Effect of Their Attire on Middle-School Students' Behavior and Learning***. (**Doctoral Dissertations, Walden University). ERIC ProQuest LLC. https://eric.ed.gov/?id=ED566809

Slabbert, A. (2019). Lecturer Dress Code and Student Perceptions of Lecturer Professional Attributes. *Journal of Psychology in Africa,* 29 (2), 176-181. https://doi.org/10.1080/14330237.2019.1603343

Slapian,M. L., Feber,S. N., Gold J. M. & Rutchick, A. M. (2015).The Cognitive Consequences of Formal Clothing. *Social Psychological and Personality Science,* 6(6), 661-668. https://journals.sagepub.com/doi/10.1177/1948550615579462

Smith, H. I., & Larry, K. (2015). Gesticulation and Effective Communication. *International Journal of Linguistics and Communication,* 3(1), 1-5 http://dx.doi.org/10.15640/ijlc.v3n1a1

Verma, A., & Chandel, N. P. S. (2015). Effect of Eye Contact on Academic Anxiety of Learning Disabled Students in Inclusive Classroom. *Asian Resonance,* 4(4), 181-184.

Weisbuch, M., & Ambady, N. (2009). Unspoken Cultural Influence: Exposure to and Influence of Nonverbal Bias. *Journal of Personality and Social Psychology*, 96(6), 1104–1119. https://doi.org/10.1037/a0015642

Wright, M., & Chorin, A. (1999). *Mathematics and Science. Division of Mathematical Science.* National Science Foundation. https://nsf.gov/pubs/2000/mps0001/mps0001.pdf

Yang, X. (2017). The use of Body Language in English Teaching. *Theory and practice in Language Studies,* 7(12), 1333-1336. http://dx.doi.org/10.17507/tpls.0712.23

The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 39-49
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.172

The Relationship between Mobbing Towards Teachers and Psychological Resilience in Educational Institutions

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Abstract
In this study, the relationship between the mobbing experienced by the teachers in the Dulkadiroğlu district of Kahramanmaraş, Turkey, and their psychological resilience was investigated. The sample of this study was formed by a randomly selected group of 290 teachers. Psychological Mobbing Scale (Ocak, 2008) and Psychological Resilience Scale (Işık, 2016) were used in the study, and the data obtained were analyzed using correlation and regression techniques. Findings of the study revealed that there is a negative and significant relationship between the mobbing that teachers are exposed to and their psychological resilience. In addition, it was also found that the mobbing experienced by the teachers is a significant predictor of their psychological resilience.

Keywords: Mobbing, Psychological Resilience, Teacher

Introduction

Effective educational activities can be said to be an important way to adapt to the conditions of the changing and developing world of the 21st century. Law-makers and education administrators should make effort to remove all obstacles against the proper implementation of these activities. Mobbing is thought by researchers to be one of the obstacles to the positive results of educational activities. As considered one of the serious obstacles to employees' commitment to the organization and job satisfaction, mobbing is the harassment committed by a colleague or a group of colleagues, targeting a person in the organization and planning his dismissal from the organization (Duffy and Sperry, 2007). In other words, it refers to hostile behaviours such as psychological terror, threats and humiliation applied to a person or group in the organization by their superiors or colleagues at least once a week for at least six months (Leymann, 1996). Mobbing is a case that every employee may be exposed to, which can have severe personal and organizational consequences. Due to mobbing, organizations can lose their efficient employees, organizational trust perceptions of employees can be damaged and organizations can face punitive sanctions. Ilhan Isman, who is the head of Association of Fighting against

Mobbing, indicates that 40 percent of the work population suffer from mobbing and this figure corresponds to 9 million 600 thousand people in Turkey (9 million 600 thousand people suffer from mobbing in Turkey, 2018). Teaching is one of the professions where mobbing is most experienced. Hubert and Veldhoven (2001) state that the rate of mobbing victims among teachers is 37.3% while Cemaloğlu (2007) indicates that 50% of the teachers are mobbed at school. Moreover, Bilgel, Aytaç, and Bayram (2006) address that 55% of employees in the health, education and security sectors experience mobbing. Based on these data, it can be said that the frequency of mobbing is high in educational organizations, which can reduce the efficiency, effectiveness and quality of educational activities.

Educational organizations are one of the institutions that shape the futures of students and therefore societies. In this respect, the cases such as mobbing, which reduce teachers' motivation, job satisfaction and commitment to organization, and cause burnout, should not take place in educational institutions. It is necessary at schools to prevent mobbing towards teachers, to ensure that teachers are least affected by mobbing, and to equip them with the skills to cope with such negativity. Psychological resilience can be said to be one of these skills. In this context, the main purpose of this study is to determine the relationship between the mobbing that teachers are exposed to and their psychological resilience.

Mobbing was defined as behaviours such as harassment, threats and humiliation encountered in organizations, while psychological resilience was defined as the ability to reduce stress and cope with negativities. Mobbing consists of 7 sub-dimensions as affecting the quality of life, preventing social relations, damaging personal reputation, preventing the person from showing oneself, targeting the self, preventing the person from communicating, and interfering with the private life of the person. In addition, psychological resilience consists of 3 sub-dimensions as commitment, control, and challenge.

Mobbing

Mobbing has been ignored and hidden, although it has always been presumed to have existed since the establishment of first labour organizations in history. Mobbing, which is likely to occur in any organization with communication, interaction and hierarchy, is one of the organizational problems to the detriment of the employee, organization and managers. The problem is getting more serious in educational organizations. The future of nations is possible by shaping the minds of their young individuals. Therefore, it is evident that these organizations should be kept away from negativity as much as possible. Teachers' efficiency, productivity and effectiveness in educational activities depend on their motivation. In this respect, it is important for teachers, or rather, each agent of the educational activities, to fulfil their duties with the highest efficiency and motivation. Being exposed to mobbing can be said to be one of the obstacles to this.

Mobbing refers to all behaviours such as maltreatment, threats, violence, and humiliation that are systematically applied to individuals by their superiors, colleagues or subordinates (Tınaz, 2006). It is understood from this definition that mobbing is not always caused by superiors and includes all kinds of hostile behaviour. In addition, in order for bad behaviour to be regarded as mobbing, it should be systematic, occur at least once a week and last for 6 months (Leymann, 1996). Mobbing is the process in which the mobber expects it to result in the superiority over the victim. Despite the all of these, mobbing generally does not include physical violence. There is no general specification for whom mobbing can be applied in organizations and educational institutions. Mobbing can be applied to everyone, but studies suggest that employees who are envied, self-confident, different, qualified, strong and successful are exposed to mobbing (Zapf 1999; Gökçe, 2012; Çelebi & Kaya, 2014). Davenport, Schwartz and Elliott (2008) state that successful employees would probably disturb other employees and managers, which initiates the mobbing process. Indeed, the questioning, thinking, successful teachers are not liked by the mobbers, and are tried to be oppressed by using formal and informal channels. In parallel with this inference, Peker, Inandi, and Gılıç (2018), in their research, cite the finding that teachers are more frequently exposed to mobbing in institutions dominated by an autocratic management style which strives to preserve the strict hierarchical structure of the organization, try to make decisions alone and threaten and harass employees for this. Contrary to this information, Cemaloğlu and Ertürk (2007) stated in their study that when one person's success in the workplace disturbs others, this situation may create a potential reason for the

outbreak of mobbing, although it is not true to associate the process with a single variable or a group of variables.

Some behavioural and mental disorders can be observed in individuals exposed to mobbing such as psychosomatic complaints, post-traumatic stress disorder, obsessions (Zapf, 1999), insomnia, loss of appetite, distress, crying crises, forgetfulness, sensitivity, sudden anger, silence, loss of desire to live, and dissatisfaction with the things they previously loved (Tetik, 2010). The damages of mobbing to organizations can be summarized as a decrease in the existing power of the organization, a negative organizational climate, an unsafe work environment, unwillingness in employees, and a low performance (Şener, 2013). In addition to all these, it should be kept in mind that mobbing can cause a festering sore in the minds of individuals and organizations.

Mobbing has 7 sub-dimensions as affecting the quality of life, preventing social relations, damaging personal reputation, preventing the person from showing oneself, targeting the self, preventing the person from communicating, and interfering with the private life of the person. Mobbing as affecting the quality of life is a sub-dimension involving behaviours such as assigning jobs that negatively affect the self-confidence of the individual, and do not overlap with their abilities (Karcıoğlu & Çelik, 2012), as well as giving tasks that are impossible to perform, and beyond one's capacity. Mobbing as preventing social relations is a sub-dimension that includes behaviours such as not talking to the victim, preventing the victim from talking to friends at work, being deprived of the right to interview (Cemaloğlu, 2007), and being isolated from colleagues. Mobbing as damaging personal reputation includes implications and behaviours such as being ridiculed, being subjected to snark, being exposed to insults and unfair accusations, and being called with humiliating nicknames. Mobbing as preventing the person from showing oneself refers to disregarding the ideas and suggestions of the person, keeping important information about the organization confidential from the victim, threatening them verbally or with gestures. Mobbing as targeting the self is a sub-dimension that includes insignificant physical violence. Mobbing as preventing the person from communicating should be regarded as being constantly interrupted and being criticized. The last sub-dimension which is the mobbing as interfering with the private life of the person includes gossiping and slander on the victim.

As a result, mobbing, which causes irreparable problems for both the organization and the individual, can be prevented by eliminating systemic causes as well as interaction and true communication. Additionally, it is thought that enhancing the psychological resilience of employees and teachers would be useful in minimizing the effect of mobbing. It needs explaining the concept of resilience at this point.

Psychological Resilience

Psychological resilience can be defined as the ability of people to stand strong when facing difficulties. In line with this definition, Ong, Bergeman, Bisconti, and Wallace (2006) stated that resilience is one of the main mechanisms used to develop resistance to stress and negativities. Human is a social being and needs other people to live, but when it comes to emotions, he is alone. It can be said that people have to fight alone with the loss of the most loved, failure to reach the desired, unsuccess and bad luck in social life. Those who can cope with these difficulties are psychologically strong. People with high psychological resilience believe that the work they are dealing with will result in positive results and they can challenge the factors causing stress in daily life. People with low psychological resilience, on the other hand, withdraw into themselves and experience stress, depression and burnout. In this context, resilience is the positive role of personal differences in reactions to stress and difficulties (Fletcher and Sarkar, 2013). In addition, Terzi (2008) argues that resilience is a personality trait that helps to cope with stress. According to these statements, people with high psychological resilience will be able to cope with difficulties, regard these difficulties as opportunities for learning, take control of their lives, adapt easily to unexpected changes and ultimately will be successful. This personal strength will, in turn, bring advantages to the organization. The high psychological resilience of the employees increases the quality of work life and brings balance and synergy to the organization, which is among the organizational benefits (Sezgin, 2012). It can be said that employees with a high level of psychological resilience, when compared to those with low psychological resilience, are more likely to be successful, and thereby, will contribute to the success of their organization.

Psychological resilience has 3 sub-dimensions as commitment, control, and challenge. The “commitment” dimension is a sense of purpose and meaning that occurs through the employee's passive involvement in daily events without being excluded from the events (Sezgin, 2012). The “control” dimension refers to the employee's self-determination for their life, the ability to neutralize negative external forces and to take responsibility for their emotions and behaviors (Terzi, 2008). The “challenge” dimension is that employees accept change as a part of the flow of life and see change as an opportunity for improvement (Er, 2018). As a result, it can be said that employees who are committed to their work, have control over it, can stay strong and challenge the difficulties in all conditions will be more resilient and successful, thus increasing the resilience and success of the organization.

Relationship between Psychological Resilience and Mobbing in Teachers

Teaching is one of the critical professions that shape the future of nations. It is important to perform this profession in the most effective way. For this, obstacles to the proper practice of the teaching profession must be eliminated. It was found that teachers' organizational commitment (Karakoç, 2016; Durusu, 2019) and motivation decreased (Avcı, 2015) and their burnout levels increased (Tanhan and Çam, 2011) due to mobbing, which is one of these obstacles. In this respect, mobbing should be eliminated completely, if this is not possible, its effects on both the organization and the individual should be minimized. It can be suggested that one of the ways to minimize the effects of mobbing on the individual is to increase the psychological resilience levels of teachers. It can be argued that teachers who are strong and highly resilient and can challenge the factors causing stress in daily life may be less affected by mobbing than other teachers.

Purpose of the Study

The main purpose of the study is to reveal the relationship between the mobbing that teachers suffer from and their psychological resilience. In addition, it was also tried to determine the predictive level of the mobbing on their psychological resilience.

Method

Research Model

The relational survey model was used in this study, in which the relationship between mobbing towards teachers and their psychological resilience was aimed to be revealed. Relational survey model aims to determine whether there is a covariance between two or more variables as well as the degree of change (Fraenkel & Wallen, 2009). Additionally, the idea that underpins the survey studies is that if people want to learn what people think, it should be asked directly to them (Christensen, Johnson & Turner, 2015).

Population and Sample

The population of the study consists of 2939 teachers working in 210 public schools in Dulkadiroğlu district of Kahramanmaraş, Turkey, during 2019-2020 academic year. The responses of 290 teachers who were selected by random sampling were evaluated. The sample of the study consists of a total of 290 teachers (172 female and 118 male teachers). According to Saunders, Lewis and Thornhill (2009), in line with the sample calculation for the population whose size is definite, the sample of this research is at 95% confidence level and 5% error range.

Data Collection Tool

In this study, two different scales were used to collect data. In addition, the Personal Information Form prepared by the researchers was used to determine the personal characteristics of the teachers. The Psychological Resilience Scale (Işık, 2016) was employed to measure the psychological resilience of teachers. The Psychological Resilience Scale consists of 21 items that express the individual's beliefs about himself and his life, and three sub-dimensions: commitment, control, and challenge. The psychological resilience of the teachers

was determined with a five-point Likert-type scale grading 1 point "totally disagree" to 5 points "totally agree". High scores from the scale indicate a high level of psychological resilience. Cronbach alpha reliability coefficient for the whole scale is .76 while it is .62 for commitment, .69 for control and .74 for challenge (Işık, 2016). As a result of the reliability analysis made by the researchers for this study, the Cronbach alpha reliability coefficient for the whole scale was found to be .83, while it was .84, .82, .81 for commitment, control and challenge sub-dimensions respectively.

Psychological Mobbing Scale developed by Ocak (2008) was used to determine the mobbing behaviours experienced by teachers. The scale consists of 39 items and 7 sub-dimensions: affecting the quality of life, preventing social relations, damaging personal reputation, preventing the person from showing oneself, targeting the self, preventing the person from communicating, and interfering with the private life of the person. The Cronbach alpha reliability coefficient for the whole scale was calculated as .82 while it is .91 for affecting the quality of life, .90 for preventing social relations, .87 for damaging personal reputation, .70 for preventing the person from showing oneself, .80 for targeting the self, .80 for preventing the person from communicating, and .79 for interfering with the private life of the person (Ocak, 2008). As a result of the reliability analysis made by the researchers, the Cronbach alpha reliability coefficient for the whole scale was found .94, and as for sub-dimensions, .83 for affecting the quality of life, .87 for preventing social relations, .89 for damaging personal reputation, .75 for preventing the person from showing oneself, .73 for targeting the self, .81 for preventing the person from communicating, and .77 for interfering with the private life of the person.

Analysis of Data

Correlation analysis was conducted to determine whether there was a significant relationship between each dimension of teachers' exposure to mobbing and their psychological resilience. In addition, the information on whether the psychological resilience of teachers is predicted by the mobbing they experienced was determined using multiple regression analysis. Results were interpreted and discussed in line with these analyzes. 0.05 and 0.01 were used as significance levels in the study.

Findings

Pearson's correlation and regression analyzes were used to determine the relationships between the variables of the study. Findings and descriptive statistics are given in tables.

Table 1: Correlation Analysis Results for the Relationship Between Mobbing Towards Teachers and Psychological Resilience

Mobbing as	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Mean**	**Sd.**
Affecting the quality of life	1										2,00	.793
Preventing social relations	.746**	1									1.74	.730
Damaging personal reputation	.762**	.837**	1								1.64	.630
Preventing the person from showing oneself	.805**	.674**	.657**	1							2.23	.867
Targeting the self	.574**	.737**	.807**	.485**	1						1.45	.568
Preventing the person from communicating	.745**	.748**	.736**	.735**	.562**	1					1.89	.803
Interfering with the private life of the person	.652**	.746**	.798**	.541**	.697**	.634**	1				1.64	.819
Control	-.089	-.154**	-.207**	-.043	-.247**	-.107	-.131*	1			3.81	.397
Commitment	-384**	-375**	-.411**	-.318**	-.371**	-.342**	-.357**	.352**	1		4.12	.457
Challenge	-.046	-.074	-.151*	.016	-.214**	-.064	-.075	.445**	.396**	1	3.77	.399

Table 1 shows correlation analysis results for the relationship between mobbing towards teachers and psychological resilience. Accordingly, there is a significant negative relationship between mobbing as affecting

the quality of life and commitment sub-dimension of psychological resilience (r=-.384, p<.01); however, affecting the quality of life has no significant association with control (r=-.089, p>.05) and challenge (r=-.046, p>.05).

Mobbing as preventing social relationships has a significant negative relationship with control (r=-.154, p<.01) and commitment (r=-.375, p<.01) sub-dimensions of psychological resilience while it has no significant association with challenge (r=-.074, p>.05).

Mobbing as damaging personal reputation has a significant negative relationship with all three sub-dimensions of psychological resilience: control (r=-.207, p<.01), commitment (r=-.375, p<.01) and challenge (r=-.151, p<.01).

Mobbing as preventing the person from showing oneself has a significant negative relationship with commitment sub-dimension of psychological resilience (r=-.318, p<.01); whereas, it has no significant association with control (r=-.043, p>.05) and challenge (r=-.016, p>.05).

As in damaging personal reputation, mobbing as targeting the self has a significant negative relationship with all three sub-dimensions of psychological resilience: control (r=-.247, p<.01), commitment (r=-.371, p<.01) and challenge (r=-.214, p<.01).

Mobbing as preventing the person from communicating has a significant negative relationship with commitment sub-dimension of psychological resilience (r=-.342, p<.01); however, it has no significant association with control (r=-.107, p>.05) and challenge (r=-.064, p>.05).

As a last, mobbing as interfering with the private life of the person has a significant negative relationship with control (r=-.131, p<.01) and commitment (r=-.357, p<.01) sub-dimensions of psychological resilience while it has no significant association with challenge (r=-.075, p>.05).

Table 2: Multiple Regression Analysis Results for Prediction of Mobbing on Psychological Resilience

Psychological Resilience	**Commitment**				**Control**			
Variable	**B**	**SE**	**β**	**T**	**B**	**SE**	**β**	**T**
Constant	4.294	.067		63.632	3.979	.073		54.842
Affecting the quality of life	-.082	.054	-.164	-1.507	.022	.059	.043	.373
Preventing social relations	-.017	.062	-.031	-.272	.017	.066	.032	.263
Damaging personal reputation	-.094	.085	-.149	-1.110	-.146	.091	-.230	-1.601
Preventing the person from showing oneself	.005	.044	.011	.111	.055	.048	.120	1.158
Targeting the self	-.086	.066	-.123	-1.295	-.163	.071	-.232	-2.287
Preventing the person from communicating	-.003	.048	-.005	-.056	-.011	.051	-.022	-.213
Interfering with the private life of the person	-.013	.045	-.027	-.290	.055	.048	.112	1.132
	R=.438 R^2=.192				R=.280 R^2=.078			
	$F_{(5)}$=9.521 P<.001				$F_{(5)}$=3.415 P<.001			

Psychological Resilience	**Challenge**			
Variable	**B**	**SH**	**β**	**T**
Constant	4.303	.083		51.895
Affecting the quality of life	-.011	.067	-.019	-.163
Preventing social relations	.094	.076	.150	1.241
Damaging personal reputation	-.155	.104	-.214	-1.493
Preventing the person from showing oneself	.096	.054	.182	1.765
Targeting the self	-.239	.082	-.297	-2.929
Preventing the person from communicating	-.032	.058	-.057	-.550
Interfering with the private life of the person	.077	.055	.139	1.403
	R=.287 R^2=.082			
	$F_{(5)}$ =3.591 P<.001			

Table 2 shows the results of regression analysis on the prediction of mobbing that teachers are exposed to on their psychological resilience. Accordingly, mobbing sub-dimensions are predictive of all psychological resilience sub-dimensions ($p<.01$).

Commitment

Commitment sub-dimension of psychological resilience has a significant relationship with all of seven sub-dimensions of mobbing ($R=.438$; $R^2=.192$; $p<.01$). Mobbing sub-dimensions explain about 19% of the total variance in “commitment” sub-dimension. According to the standardized regression coefficient (β), the relative significance order of the predictor variables on the commitment sub-dimension is as follows: “preventing the person from showing oneself” (β=.011), "preventing the person from communicating" (β=-.005), "interfering with the private life of the person" (β=-.027), "preventing social relations" (β=-.031), "targeting the self" (β=-.123), "damaging personal reputation" (β=-.149) and "affecting the quality of life" (β=-.164).

Control

Control sub-dimension of psychological resilience has a significant relationship with all of seven sub-dimensions of mobbing ($R=.280$; $R^2=.078$; $p<.01$). Mobbing sub-dimensions explain about 8% of the total variance in “control” sub-dimension. According to the standardized regression coefficient (β), the relative significance order of the predictor variables on the control sub-dimension follows as "preventing the person from showing oneself" (β=.120), "interfering with the private life of the person" (β=.112), "affecting the quality of life" (β=.043), "preventing social relations" (β=.032), "preventing the person from communicating" (β=-.022), "damaging personal reputation" (β=-.230) and "targeting the self" (β=-.232).

Challenge

Challenge sub-dimension of psychological resilience has a significant relationship with all of seven sub-dimensions of mobbing ($R=.287$; $R^2=.082$; $p<.01$). Mobbing sub-dimensions explain 8.2% of the total variance in “challenge” sub-dimension. According to the standardized regression coefficient (β), the relative significance order of the predictor variables on the challenge sub-dimension is as follows: "preventing the person from showing oneself" (β=.182), "preventing social relations" (β=.150), "interfering with the private life of the person" (β=.139), "affecting the quality of life" (β=-.019), "preventing the person from communicating" (β=-.057), "damaging personal reputation" (β=-.214) and "targeting the self" (β=-.297).

Discussion, Conclusion and Suggestions

In this study, according to teachers 'opinions, the relationship of mobbing experienced by teachers with their psychological resilience was aimed to be examined as well as the predictive level of mobbing on psychological resilience. First of all, considering the relationship between mobbing that teachers are exposed to and psychological resilience, a significant negative relationship was found between mobbing sub-dimensions and psychological resilience sub-dimensions. Therefore, all hostile attitude, implication, harassment, intimidation, coercion and pressure that can be accepted as mobbing negatively affect the psychological resilience of teachers and psychological resilience decreases as mobbing increases; or vice versa, as the psychological resilience of teachers increases, mobbing decreases. In the studies of Ünal and Nenni (2016) and Kayacı (2014), it was concluded that the high level of psychological resilience reduced the possibility of mobbing. Therefore, the violence and continuity of mobbing reduces the psychological resilience of teachers, while those who are psychologically strong are less exposed to mobbing. According to this finding, increasing the psychological resilience of teachers may decrease their possibility of suffering from mobbing.

Mobbing that teachers are exposed to is a significant predictor of their psychological resilience. Mobbing affects all dimensions of psychological resilience. This situation brings to mind that the mobbing that teachers are exposed to strengthens their psychological resilience. It can be interpreted that, although mobbing in educational organizations forces the teachers spiritually in the short term, teachers can continue their lives as psychologically

strong individuals at the end of mobbing in the long term. According to the correlation analysis results, when teachers are exposed to mobbing, their psychological resilience decreases, whereas, the regression analysis results show that mobbing strengthens the psychological resilience of teachers. This situation, which can be seen as a contradiction, is in fact that teachers are mentally and spiritually weakened at the earlier stages of mobbing, however, in the later stages, they become psychologically resilient teachers who can stand unwavering in the face of negativities, tell the truth without hesitation, turn the changing conditions into opportunities for personal development, and take the responsibility for their actions. These findings are consistent with the finding of Ünal and Nenni (2016) that there is a negative relationship between psychological resilience and mobbing. The interpretation made in the same study that the development of psychological resilience factors will decrease the level of exposure to mobbing in the workplace sounds reasonable when considering the results of this study. In her study on academicians, Kayacı (2014) lists the reasons for exposure to mobbing as becoming successful and different stating that this victimization makes them depressed, silent and hopeless. In addition, the interpretation in the same study that mobbing can improve the resilience of employees is also consistent with the findings of this study. In the study of Heugten (2012), it was revealed that those who were exposed to mobbing gained more resilience (flexibility) after the difficult period when compared to their previous life. This finding also supports the findings of the study. After these explanations, discussion and conclusion sections will be included for the sub-dimensions of the variables in the study.

The Relationship of Mobbing Sub-Dimensions with Psychological Resilience Sub-Dimensions and Their Prediction Level on Psychological Resilience

A significant negative correlation was found between mobbing as affecting the quality of life and the commitment sub-dimension of psychological resilience. Underestimating teachers by assigning them simple and insignificant tasks, confronting them with difficult tasks that are not legally possible to achieve, criticizing them indigenously, making them exposed to exaggerated inspections and controls restrain teachers from committing themselves to educational activities and engaging in their work. Hoel and Cooper (2000) state that giving very early deadline for a job or giving jobs that are impossible to complete is a common mobbing behaviour style. This situation can be considered as one of the serious obstacles for teachers to properly fulfil their duties.

A significant negative correlation was also found between mobbing sub-dimension as preventing social relations, and control and commitment sub-dimensions of psychological resilience. The hostile attitudes faced by teachers, being ignored and prevented from communicating with their friends, and thus isolated, hinder them from commitment to work as well as making and practising their own decisions in educational activities. As a result, teachers avoid taking initiative and become silent and passive. Hüsrevşahi's (2015) study which revealed a significant relationship between mobbing and teachers' silence supports the findings of the study.

Mobbing as damaging personal reputation was found to have a significant negative correlation with all sub-dimensions of psychological resilience, which is also an important indicator of how closely the two variables of the study are actually related to each other. Teachers whose professional skills are questioned and who are exposed to unfair criticism, snark and mocking begin to be psychologically less resilient. Montalban and Duran (2005) found that mobbing victims are most frequently exposed to criticism and humiliation. These findings are particularly similar to the humiliation phenomenon of this study that occurs in the form of snark and mocking.

A significant negative correlation was also revealed between mobbing as preventing the person from showing oneself and the commitment sub-dimension of psychological resilience. Teachers whose opinions are ignored and who are threatened or even scolded tend to be weak in their belongingness and commitment to their jobs. Pranjic, Bilic, Beganlic and Mustajbegovic (2006) found that mobbing victims who face with behaviours such as threat, isolation, and exclusion are unable to work, which is consistent with the findings of this study.

As in damaging personal reputation, a significant negative correlation was also found between mobbing as targeting the self and all sub-dimensions of psychological resilience. Based on these data, it can be stated that trying to prevent teachers from talking with their colleagues and intimidating them influences their psychological resilience negatively. Teachers whose communication with their colleagues is interrupted and who

are led to alienation and exposed to psychological violence are negatively affected by this situation in psychological terms.

A significant negative correlation was found between mobbing as preventing the person from communicating and commitment sub-dimension of psychological resilience. Teachers who are interrupted and whose communication with their colleagues and management are blocked are negatively affected by this situation. In line with these inferences, Kutluca and Sezgin (2007) concluded that faculty members were exposed to mobbing behaviours such as interrupting their words (46%), exclusion (46%) and hiding important information about work (45%).

Lastly, mobbing as interfering with the private life of the person was found to have a significant negative correlation with control and commitment sub-dimensions of psychological resilience. The teachers, about whom unfounded rumours were made, get to become poor in psychological resilience. Montalban and Duran (2005) state that gossiping is one of the common mobbing behaviours.

According to the results of the regression analysis, the mobbing sub-dimensions are significant predictors of the "commitment" dimension of psychological resilience. Accordingly, teachers' taking initiative about their school and students as well as fulfilling their responsibilities are closely related to the mobbing behaviours they are exposed to. Undoubtedly, the most striking of the regression results is the high regression coefficient of mobbing sub-dimensions in "commitment". Mobbing explains about 20% of variance in this sub-dimension. Teachers' commitment to their work will increase their motivation, and thus, the quality of educational activities. If one can imagine the educational environments in which mobbing can be minimized, it can be claimed by looking only at this data that the current education level would be much better than it is now. In addition, mobbing sub-dimensions are also significant predictors of the "control" dimension of psychological resilience. The ability of teachers to get rid of negative effects and take responsibility for their emotions and behaviours while performing their educational activities, and their ability to direct their students' and their own learning are all relevant to the mobbing they are exposed to. As a last, according to the results of regression analysis, mobbing sub-dimensions are also significant predictors of the "challenge" dimension of psychological resilience. The ability of teachers to adapt to the changing conditions of the time, to accept change as a part of life and to see change as an opportunity for improvement pertains to the mobbing they are exposed to. The finding by Gönlüaçık (2017) that psychological mobbing is a predictor of psychological resilience is consistent with the results of this study. Maidaniuc-Chirilă (2015) found that employees with high resilience show resistance strongly when they encounter bullying behaviours in the workplace.

In conclusion, there is a significant negative relationship between mobbing and psychological resilience according to teachers' opinions. It can be said as a result of this study that teachers who were exposed to mobbing are negatively affected by this situation, even if their resilience and self-confidence are high. Such teachers can experience organizational negativities such as decrease in motivation and productivity, and reluctance to perform educational activities. This situation in educational institutions would damage the educational activities.

As for the suggestions to the practitioners, a clear description of mobbing should be made and all mobbing behaviours should be fairly charged. A team of education supervisors can be given training on this issue and specifically assigned to solve such problems in educational organizations. Teachers should be informed about mobbing and be convinced that no political and bureaucratic power will ignore them. Only in this way can the actual number of mobbing cases in educational organizations be reached. In addition, not the organizational or political position of the mobbing practitioner but what s/he does, why s/he does it and the punishment to be given should be at the forefront as a result of this action. Furthermore, it can be suggested that the mobbing behaviours strengthen the teachers psychologically after certain stages and make them more resilient than they were beforehand. It is necessary to give psychological support to teachers that will keep them strong during the mobbing they are exposed to. Therefore, although not in every school, psychologist teachers may be assigned in the school districts to be determined. Psychologists who can work in parallel with the job description of school

counsellor can help teachers. It should be noted that there is not a single teacher, a single manager or a single student that can be sacrificed in educational activities.

For the researchers, following suggestions can be made. The relationship of mobbing behaviours with other organizational behaviours such as burnout, alienation, organizational cynicism and so on can also be investigated. In addition, the correlation of psychological resilience with leadership styles or change can be studied in further researches.

References

Avcı, L. (2015). Öğretmenlerin yıldırma (mobing) yaşama düzeyleri ile motivasyon düzeyleri arasındaki ilişkinin incelenmesi (Düzce ili örneği). Yüksek Lisans Tezi, Yeditepe Üniversitesi, İstanbul.

Bilgel, N., Aytaç S. & Bayram N. (2006). Bullying in Turkish white collar workers. Occupational Medicine, 56(4), 226-231.

Cemaloğlu, N. (2007a). Örgütlerin kaçınılmaz sorunu: Yıldırma. Bilig, 42, 111-126.

Cemaloğlu, N. (2007b). The exposure of primary school teachers to bullying: An analysis of various variables. Social Behaviour and Personality, 35(6), 789-802.

Cemaloğlu, N. & Ertürk A. (2007). Öğretmenlerin maruz kaldıkları yıldırma eylemlerinin cinsiyet yönünden incelenmesi. Türk Eğitim Bilimleri Dergisi, 5(2), 345-362.

Christensen, L. B., Johnson, R. B. & Turner, L. A. (2015). Araştırma Yöntemleri Desen ve Analiz. (A. Aypay, Çeviri Editörü). Ankara: Anı Yayıncılık.

Çelebi, N. & Kaya, G. T. (2014). Öğretmenlerin maruz kaldığı mobbing (yıldırma): Nitel bir araştırma. Eğitim ve İnsani Bilimler Dergisi: Teori ve Uygulama, 5(9), 43-66.

Davenport, N., Schwartz, R.D., & Elliott, G.P. (2008). Mobbing: İşyerinde Duygusal Taciz. (Çev. Osman Cem Önertoy). İstanbul: Sistem Yayınları.

Duffy, M., & Sperry, L. (2007). Workplace mobbing: ındividual and family health consequences. The Family Journal, 15(4), 398–404.

Durusu, H. (2019). Öğretmenlerin yıldırma yaşama, iş yeri arkadaşlık algısı ile örgütsel bağlılık düzeyleri arasındaki ilişki ve bazı değişkenlere göre incelenmesi (Bilecik ili örneği). Doktora Tezi, Gazi Üniversitesi, Ankara.

Er, N. (2018). İlkokul öğretmenlerinde öz yeterliğin yordayıcıları olarak psikolojik dayanıklılık ve proaktif kişilik özellikleri. Yüksek Lisans Tezi, Gazi Üniversitesi, Ankara.

Fraenkel, Jack R., & Wallen, Norman E. (2009). How to Design and Evaluate Research in Education (Seventh ed.). New York: McGraw-Hill.

Gökçe, A. T. (2012). Mobbıng: İş yerinde yıldırma özel ve resmi ilköğretim okulu öğretmen ve yöneticileri üzerinde yapılan bir araştırma. Dicle Üniversitesi Ziya Gökalp Eğitim Fakültesi Dergisi, 18(2), 272-286.

Gönlüaçık, N. (2017). İş yerinde psikolojik yıldırmayı(mobbing) yordayıcı değişkenler: psikolojik dayanıklılığın etkisi (Ankara ilinde hemşireler üzerine bir araştırma). Yüksek lisans tezi, Başkent Üniversitesi, Ankara.

Heugten, V. K. (2012). Resilience as an under explored outcome of workplace bullying. Qualitative Health Research, 23(3), 291-301.

Hoel, H. and Cooper, C.L. (2000). Destructive conflict and bullying at work. Manchester School of Management , University of Manchester Institute of Science and Technology, UK.

Hubert, A. & Veldhoven, M. (2001). Risk sectors for undesirable behaviour and mobbing. European Journal of Work and Organizational Psychology, 4(10), 415-424.

Hüsrevşahi, S. (2015), Relationship between organizational mobbing and silence behavior among teachers. Educational Sciences: Theory & Practice, 15(5), 1179-1188.

Işık, Ş. (2016). Psikolojik dayanıklılık ölçeğinin geliştirilmesi: geçerlik ve güvenirlik çalışması. The Journal of Happiness and Well-Being, 4(2), 165-182.

Karakoç, B. (2016). Öğretmenlerin okulda karşılaştıkları yıldırma davranışları ile örgütsel bağlılıklarının çeşitli değişkenler açısından incelenmesi. Yüksek Lisans Tezi, Cumhuriyet Üniversitesi, Sivas.

Karcıoğlu, F. & Çelik Ü., H. (2012). Mobbing (yıldırma) ve örgütsel bağlılığa etkisi. Atatürk Üniversitesi İktisadi ve İdari Bilimler Dergisi, 26(1), 59-75.

Kayacı, Ü. (2014). Akademik ortamlarda psikolojik şiddet (mobbing) ve yılmazlık. Türk Eğitim Bilimleri Dergisi, 12(2), 67-78.

Kutluca, A. N., Sezgin Nartgün Ş. (2007). Üniversitelerde Mobbing. XVI. Ulusal Eğitim Bilimleri Kongresi Bildiri Kitabı. Tokat, 5-7 Eylül 2007, cilt.3, 691-697.

Leymann, H. (1996). The content and development of mobbing at work. Europen Journal of Work and Organizational Psychology, 5, 165-184.

Maidaniuc-Chirilă, T. (2015). The mediation role of resilience on the relationship between workplace bullying and romanian employees' strain. Revista de Cercetare şi Intervenţie Socială, 44(14), 120-133.
Montalban, F. M. & Duran, M. A. (2005). Mobbing: A Cultural Approach of Conflict in Work Organizations. IACM 18th Annual Conference.
Ocak, S. (2008). Öğretmenlerin duygusal taciz (mobbing)'e ilişkin algıları. Yüksek Lisans Tezi, Trakya Üniversitesi, Edirne.
Ong, A. D., Bergeman, C. S., Bıscontı, T. L. & Wallace, K. A. (2006). Psychological resilience, positive emotions, and successful adaptation to stress in later life. Journal of Personality and Social Psychology, 91(4), 730-749.
Peker, S., İnandı, Y. & Gılıç, F. (2018). The relationship between leadership styles (autocratic and democratic) of school administrators and the mobbing teachers suffer. European Journal of Contemporary Education, 7(1), 150-164.
Pranjic, N., Bilic, L. M., Beganlic, A. & Mustajbegovic, J. (2006). Mobbing, stres and work ability index among physicians in Bosnia and Herzegovina: Survey study. Croat Medical Journal, 47, 750-758.
Saunders, M., Lewis P. & Thornhill A. (2009). Research Methods for Business Students. Essex: Prentice Hall.
Sezgin, F. (2012) İlköğretim okulu öğretmenlerinin psikolojik dayanıklılık düzeylerinin incelenmesi. Kastamonu Eğitim Dergisi, 20(2), 489-502.
Şener, O. (2013). Genel kamu liselerinde psikolojik yıldırma ve örgütsel bağlılık ilişkisi. Çankırı Karatekin Üniversitesi Karatekin Edebiyat Fakültesi Dergisi, 1(1), 47.
Tanhan, F. & Çam, Z. (2011). The relation between mobbing behaviors teachers in elementary schools are exposed to and their burnout levels. Procedia Social and Behavioral Sciences, 15(2), 2704–2709.
Terzi, Ş. (2008). Sosyal destek arasındaki ilişki. Türk Psikolojik Danışma ve Rehberlik Dergisi, 3(29), 1-11.
Tetik, S. (2010). Mobbing kavramı: birey ve örgütler açısından önemi. KMÜ Sosyal ve Ekonomik Araştırmalar Dergisi, 12(18), 81-89.
Tınaz, P. (2006). İşyerinde mobbing (mobbing). Çalışma ve Toplum Dergisi, 10(4), 13-28.
"Türkiye'de 9 milyon 600 bin kişi mobbinge uğruyor." (2018, 24 Ekim). Erişim adresi: https://t24.com.tr/haber/turkiyede-9-milyon-600-bin-kisi-mobbinge-ugruyor.
Ünal, A. & Nenni, F. (2016). Hastane Çalışanlarında Psikolojik Dayanıklılık ve Mobbing İlişkisi. IV. Örgütsel Davranış Kongresinde Sunulan Bildiri, Çukurova Üniversitesi, Adana.
Yaman, E. (2015). Mobbing and stress. International Journal of Progressive Education, 1(2), 6-13.
Zapf, D. (1999). Organisational work group related and personal causes of mobbing/bullying at work. International Journal of Manpower, 20(1/2), 70–85.

The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 49-60
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.173

Towards Professional Development: Training Needs Assessment of Primary School Theater Teachers in Greece

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Abstract
The purpose of this research is to investigate the professional training needs of theater educators, as they arise based on their views, who work in primary education. The fact that triggered the inception of this research was that studies concerning aesthetic education in Greece refer to all specialties (musicians, visual artists, theater educators). In some cases, research addressed in training needs that music educators or visual artist have, but not for training needs theater educators have. Consequently, the educational needs of the above specialties may converge in some areas, but, depending on the specialty, they differ in others. Additionally, until 2019, the Greek ministry of education considered the in job-training of theater educators a minor issue. For those reasons, emerged the importance of a research for the specialty of theater educators. In this context, therefore, a qualitative research was designed and conducted using a sample of thirteen theater educators, who work in primary schools in the prefecture of Heraklion, Crete. Semi-structured interviews were used to collect data and the results were analyzed by topic. The thematic analysis showed that there is an urgent need for training programs in certain areas.

Keywords: Training Needs, Theater Educators, Art, Theatre

1. Introduction

In our daily lives we use the word 'need', using a different meaning each time, such as necessity, desire or demand. This confusion may lead to the emergence of concepts about needs, which in economic terms, defined as supply and demand (Vergidis et al., 2010). Scriven & Roth (1990) state that a need is defined as something that can really exist and satisfy and not with something idealized or a desire. Studies concerning teachers' professional needs has been a subject for many researchers because, covering the current professional shortage reduces the gap between what one knows and what one needs to learn (Hunt, 1986 • Vergidis et al., 2010 • Kaufman & English, 1976). Goliaris (1998, as cit. In Vergidis, 2015) states that educational needs are defined as the overall teaching objects that interest a teacher. By approaching them comprehensively, a teacher will be able to improve his professional profile. In the same direction, Kapsalis and Rampidis (2006) point out that the purpose of every professional is to offer work of high social responsibility. But to achieve this, he must be able

to oversee the complex relationships and interdependencies of his professional field. Teachers, as a professional field, succeed in meeting their specific professional needs through various educational trainings. An active educator, in order to be able to meet modern demands of society, must develop both personally and professionally. The training process is an integral part of his personal and professional development.

In Greece, research results (Sfontouri, 2019 • Kotsiori, 2017 • Tsarmopoulos, 2018) showed that training needs vary, not only depending on the field and specialty, but even depending on the University of graduation, since pedagogical courses are compulsory in some university departments, but differs the content as well as the teaching method. In addition, it seems that even for teachers of the same specialty, training needs vary, depending on the elective courses offered at undergraduate level (Vergidis et al., 2010 • Kapsalis & Rampidis, 2006).

Aesthetic education is an essential part of the educational process. The school is one of the most suitable institutions for the education of students in the arts. Theatrical education, as an integral part of aesthetic education, is called to convey to students the sense of art. The quality of the theatrical education course also determines the students' interest in the art of theater. In this part a key role is played by the teacher who undertakes to teach the subject (Greenwood as cit. In Schonmann, 2011).

The role of art, and more specifically of theater in education, has been proven to be absolutely important in the educational process (Cachia & Ferrari, 2010). In the Greek educational system, this important recognition began to appear since 1990 (Sextou, 2002), a year when the introduction of specialized teachers in the field of theater began. However, despite the long-term presence of theater educators in schools, the competent hosts that undertake trainings, provide a wide range of options for key disciplines, such as that of teachers, but not for the specialty of theater educators. The present thesis aims to contribute to the investigation of this gap, seeking the training needs of theater educators who work in primary education in the prefecture of Crete in Greece.

2. Importance of teachers' training

Knowledge, especially nowadays, is produced, diffused, evolved, supplemented and replaced by a new with such a short speed that makes training an integral part of the professional and personal career of every person, every industry and every society (Pavlou, Anagnou & Fragkoulis, 2020). Vergidis et al. (2010, p.6) state that in a modern society, which is characterized by increasingly changing working conditions, the professional development of teachers is absolutely necessary. To achieve this change, teachers should be actively involved in various forms of training as well as in specific teaching activities. Teacher training is part of the educational policy for the development of lifelong learning and is therefore part of the educational change that is being undertaken.

Education, is by definition interconnected with knowledge and therefore inextricably linked to the institution of training. The rapid development of pedagogical science, the need for introduction of new approaches in the field of learning (Vallack, 2015) and the enrichment of older ones, the introduction of ICT (Giavrimis et al., 2010) and management (Anagnou, 2017) in education are a few of the reasons that make teacher training a great undertaking.

Xochelis & Papanaoum (2000, as Cit. In Kapsalis & Rampidis, 2006) state that in order for a teacher to be able to develop, both professionally and personally and to be competitive in modern requirements, he must participate in an ongoing training process. The duration should start from his entry into the profession and reach the end of his professional career.

3. Importance of aesthetic education

Increasingly in recent years, formal education programs in many countries have begun to place more emphasis on the role of art in education. As mentioned by Weitz (1972), art and education are bridged through the concept of aesthetic education. Its benefits, are widely recognized. The role of arts in the process of education is an

important qualitative renewal, as critical thinking, creativity, social, aesthetic and emotional cultivation of young people develop. The importance of art in education, both for teachers and students, reflected in research by Weitz (1972), Schonmann (2006) and Calderhead & Shorrock, (2005). When teachers know and recognize the important role of art as an educational tool, they contribute through it to the overall development of the child, which is achieved both with his mind and with his sensory-motor means.

In the Greek educational system, the subject of aesthetic education entered in 1990, when significant changes were made in educational policy concerning the curriculum of primary and secondary education. Despite the efforts of the Greek educational system, which aimed at the development of arts in education, there is still a long way to go in this direction. As early as 2002, Sextou (2002) had made reference to the importance of integrating the subject of aesthetic education in schools and its teaching by properly trained teachers. In 2015, thirteen years after the first suggestion for specially trained educators in the field of aesthetic education, the research of Zorbala et al (2015) showed that, even from universities, prospective teachers are not trained in the effective use of art in order to apply it as an educational tool.

4. Theater in education

In school environment, the art of theater has correspondingly deep roots. In particular, Bolton (1985) states that in the United Kingdom, the first to introduce theater into the classroom through theatrical play was Peter Slade in the 1930s and 1940s. Slade, although originally intended theatre to serve as an auxiliary tool in the hands of teachers, eventually became widely accepted as a good teaching practice.

Although Slade presents himself as a pioneer in this field, the one who established the method of teaching theater in education is Brian Way. Initially embracing Slade's philosophy, he later introduced techniques from Stanislavski's method. This change in the process of teaching theater in education has given teachers greater confidence in how they can manage theater as an educational tool. O'Toole (2005) states that the drama in education depends to a large extent on the respective group of students who take part in it and the external conditions that take place at the given time in the given space. Control in these conditions is limited, and consequently participants have to constantly renegotiate how they can manage and manifest the basic elements of the dramatic form. Therefore, drama in education is an ongoing process.

Bolton (1985) states that when students relate to drama, they certainly learn something. Wright (2014) agrees, adding that when drama is effective, then it becomes an educational tool. Theater in education has a multiple role. It is a communicative, creative, collective and artistic activity. Its purpose is to help students understand the social relationships that develop inside and outside the school, to socialize and be able to integrate into the wider society (Grammatas, 2001).

4.1 Theater in Greek educational curriculum

Theater as a separate subject was introduced in the Greek curriculum in 1990 (Grammatas, 2001 • Sextou, 2002). Prior to 1990, there was no official guide on how theater could be implemented in schools. General education teachers applied theater techniques based on their own knowledge, mood and experience.

The subject of theater in the Greek educational system, has no specific educational target. The course is not aimed at a predetermined correct or desired attitude, ability or knowledge. An experiential awareness is attempted in order to develop a personal attitude towards issues that each person faces as a member of a team. This experiential character aims at cultivating the expression and familiarization of the student with the theatrical act.

Theater in the Greek curriculum extends from Kindergarten to High School. The need to introduce the subject in the pre-school and in the first school phase of education arises from the indisputable fact that theatrical education contributes - as an activity and as a teaching methodology - to the better preparation of children for their integration into the pedagogical system and to the acquisition of better relations with themselves and others.

During the drafting of the detailed study guide for educators. Every effort has been made to ensure that the course combines knowledge, creation and expression in a balanced way. Regarding the structure, the spiral evolution of the contents leads from simple to complex activities and from practical to theoretical approaches.

In particular, the following is sought:

- The development of the personality, the aesthetic cultivation, the freedom of expression, the self-knowledge and the mutual respect of the students within the school team.
- The acquisition by students of that knowledge that will help them to understand, recruit and evaluate the theatrical event, and to transform their knowledge and experience.
- The creative contact of the students with the art of theatre both through the dramatic texts and through their stage expression, with the ultimate goal of expanding their studies in the cultural field.
- The enrichment of the teaching methods with the principles and techniques of the theatre (dramatization, etc.) and therefore the improvement of the teaching program as a whole. (www.pi-schools.gr)

5. Method

The data collection method was qualitative. The decisive factor was the harmonization of the method with the research question.

The research question was: What are the theater educators' training needs, according to their views?

The purpose of the research was to investigate and understand a central theme through a detailed description (Creswell, 2016; Bell, 2005; Robson, 2010). The research used a case study, since it concerns the theater educators of a particular prefecture, that of primary schools of Heraklion Crete during the school years 2019-2020. This strategy was chosen because the research aims at a deeper understanding and interpretation of personal perceptions and experiences of participants about the type and preferences regarding their professional development.

The data production and collection technique was the personal semi-structured interview. Such tool enables the sequence of questions to be modified (Bell, 2001), there is great adaptability, as the interviewer can add ideas at any point, explore deeper motivations and views. Also, there is room to clarify the answers of the respondents and there is better control of the interviewer over the information he will receive since he can ask specific questions (Robson, 2010; Creswell, 2016; Bell, 2005).Therefore, this tool has been chosen as the most appropriate to highlight the views of the participants.

5.1 Participant Characteristics

The participants of the research (convenience sampling) were 13 theater educators working in primary schools in Heraklion Crete during 2019-2020. As for gender, 3 educators were men and 10 women. The average age of the participants was 33 years and the average working experience was 8 years. Ten of them have participated in training programs, either on the subject they teach or on something different, but always in relation to their educational activity. Undoubtedly, the participants in this survey do not represent the entire population of theater educators in Greece, and consequently, the research results are not generalizable.

5.2 Data analysis method

Thematic categorization was used as a procedure for analysis of data collected from the interviews. In thematic analysis, the focus is on concepts, meanings or themes, which refer to the phenomenon under study and how it is perceived by the participants in the research. Boyatzis (1998) summarizes the thematic analysis in four stages. Clarke, Braun & Hayfield (2006, Cit. In Smith, 2015) are in the same direction, but adding important details on thematic analysis. In the present work, the choice of descriptive thematic analysis was considered the best

choice, as data resulting from the interview information do not need deeper analysis. Several testimonies were added from the information given by the participants in the final report to confirm the data.

6. Results

A general reading of the interviews was initially done, in order to highlight the thematic categories. The interviews were then divided into sections according to their content and specific headings were given. This was followed by the creation of a list of coded titles and the identification of overlaps in the coding. The final codes were collected and thus four general categories emerged. These were identified according to the answers of the teachers who participated in the interviews and based on the purpose and questions posed in the research.

At the stage of information analysis, four thematic topics were selected and used. First topic was the academic background in order to investigate if theater educators feel well trained from their universities. Second topic was the professional experience in order to obtain information about difficulties they meet in their profession. Third topic was the training needs theatre educator mention and the last topic was the participants' training preferences The present paper focuses on the training needs that theater educators mention they have.

6.1 Training needs

Theater educators' training preferences were expressed by answering questions about the content of training, host implementing the training, appropriate time to attend a training, form of training (live, distance or mixed) and appropriate time to complete a training cycle.

The largest number of participants revealed that the most basic way for a theatre educator to improve his role in the modern school environment is that of participation in seminars and trainings, continuous effort of self-improvement through internet technology and theatrical developments.

Theater educators also, emphasize on the lack of information they have about training programs. The main way to be informed about training programs is through the internet, discussions with colleagues and via relevant posts on the page of Scientific Association of Theater educators (PESYTH).

In order to attend a program, theater educators seem to place personal interest and content as key factors. Most of the participants revealed that they choose the training based on their own interests. They also try to choose from the offered training programs, first those that are directly related to their profession and then programs with different topics.

The main expectation from their participation in training programs is acquisition of new knowledge. In this way they will optimize their educational process, which implies personal professional development.

6.1.1 Content of the training programs

When asked about the content of a training program, theater educators referred both to practical and theoretical issues. Regarding the practical content of a training, it seems that the participants prefer practical tips for classroom management, ideas for new theater games, practical tips for managing students with special educational needs, teaching theater via technology and, finally, lesson plans.

...the theoretical part should focus on managing in-school problems through theatrical education, on child and adolescent psychology and on ways of communicating with specific cases of parents. Cases of abuse, domestic violence, etc.... The practical has to do both with innovative theatrical games in the field of theatrical education, and how we can deal with special cases practically, through a game. (I2)

...practices on how to teach theatrical play, creative ideas...how to deal with some difficulties in the classroom. (I6)

We have flexibility in the material we can use and in the curriculum. I can achieve the same goal through different methods, or different types of theater. So a variety would be, to know how puppet theater works and how black theater works and how new technologies in theatre works. (I11)

The content I would like to have some lesson plans. Because in 45 minutes you have to fit everything. This always makes it difficult for me. (I12)

Regarding the theoretical content of a training program, it seems that psychology related issues are preferred according to participants. In 7 of the 13 interviews, participants preferred a training to include effective ways to communicate with both students and students' parents, as well as developmental issues.

I would like better a training in psychology and problem management in pre-adolescence students because now children go into pre-adolescence from the fourth grade. And I would also like a special seminar that has to do with building relationships with parents, and how it can be built even though you are a theatre educator and not α general education teacher. (I2)

...I think lessons that have to do with psychology, these are something that would interest me and I would attend it with great pleasure. (I4)

Maybe matters of psychological nature for children... how to say ehm...developmental. To learn a little about how children develop so that we can better contribute to their psychology. I think that is missing. (I9)

6.1.2 Host implementing training

Regarding the appropriate host for the implementation of training programs, most of the participants state that it should be public. In this way, they believe, that it will be possible for all theater educators to participate without any financial cost.

First of all, definitely without any cost. It should be organized from the ministry and in-school, i.e. as usually trainings are done for other teachers. (I7)

I think the Ministry. Yes, because it is something objective, something that is offered to everyone. Because I may have to give money to go to Athens to attend a training program. But if a colleague can't afford to participate in a training program, the ministry must provide all the means, to train him or her. Yes this is a work entirely up to the ministry. (I11)

However, in the answers given by the participants, it seems that although a public host is the most appropriate, they do not exclude a private, as well as a mixed model of the two. More specifically, in 4 interviews a private host is mentioned as suitable for training theater educators.

...since we are talking about a public school, definitely a public host. But a private host also, why not. Of course for teachers it should be free. (I8)

Interviewees mention for a mixed model, that the private host should be completely relevant to the profession of theater educators and to theater in general.

I think it would be the Panhellenic Scientific Association of Theater educators. A fairly suitable host. In collaboration, however, with a legally established association of drama therapists. (I2)

Nice question...Obviously the experts of theater or experts on theatrical games. A mixed model of private and public host. But surely a private host could help more. (I9)

6.1.3 Appropriate time to attend a training

The most appropriate time for the implementation of a training program was captured by the participants with quite interesting variation. Data obtained show a preference for the implementation of in-school training during morning hours. More specifically, 7 participants report the above preference because it harmonizes with trainings attended by general teachers. There are, however, 3 participants who think that ideally trainings should be done overtime. They mention that there is obviously much more free time.

At school time. Because it is considered in-school training. I think it is perfectly productive to do it in the afternoon, but I do not think it is right since the legal framework says that everyone else (general teachers) gets trainings from 8:00 to 13:00. If everyone else does training in the afternoon I will be happy to do it in the afternoon too. (I2)

Okay, it should definitely be off-schedule and I would say maybe weekend. Yes, days that are generally more relaxed for all people. (I3)

Finally, afternoons, either on weekends or daily, are reported as the preferred time by 6 participants. This time is mentioned as ideal since everyone will be able to participate.

I think morning hours or something that starts Friday afternoon to Saturday or Sunday morning is something that is accessible to everyone or at least to most. (I4)

6.1.4 Form of training

Regarding the form that a training program should ideally have for theater educators, this is the way of physical presence. Nearly all the interviewees prefer to participate in various programs with physical presence in workshops and experiential exercises. On the other hand, none of the participants showed interest in training, purely from distance.

...I would prefer the seminar to be experiential, not theoretical. (I6)

...not in the same way that they are done for (general) teachers...our lesson has a different nature, it cannot remain in a theoretical context. I mean that for us it would be better experiential trainings. Okay theory is good but it is better when you have learned something first hand you have. (I8)

However, 2 of interviewees prefer a mixed model of training programs. A model that participants will be able to attend its content live and from distance. They emphasize that, in this way, everyone will be able to participate without having to move to another city or even another prefecture.

...to create a public organization or company of theater educators who will organize training seminars that will be accessible to all via internet due to the long distance. (I4)

...in all ways. And via internet. And physical presence. Via internet it would be useful. For those in remote areas. (I9)

6.1.5 Appropriate time to complete a training cycle

Regarding time that it takes to successfully complete a training program, participants gave a fairly wide range of answers. The minimum duration is 2 to 3 months and certainly not just a few days. The duration of two or three months offers confidence in the successful acquisition of new knowledge.

Certainly we should not talk about one-week or three-day seminars. It should be an ongoing training maybe two or three weekends a month for two months or at least something more. To be continuous, not to be a fragmentary event. (I4)

... I do not know...basically depending on what one wants to learn. If it's something I do not know I could stay in training, let's say 2 or 3 months maybe all year, depending, I do not know. It depends who will do it and what it will have as content. (I8)

On the contrary, the maximum ideal duration for a training program is 2 to 3 years.

...Difficult question because, as we know, most seminars are done now in half and a year. I would say that, ideal training should be time consuming like 2 or 3 years. But without, of course, having daily lessons. It should have more sparse lessons but longer duration per lesson. In order to have, between lessons, time to immerse in what you meet there in each session. (I3)

An important element of the answers is that all participants believe that the training process should be ongoing. Periodicity is also considered a necessary factor in programs because with this way they will be able, as mentioned, not only to attend or participate, but also to assimilate what they learn effectively.

We would gather, once in three months, to exchange views and problems so that there is feedback until the next time. So questions will be created and then answered, there should be a continuum on a training program. (I7)

7. Discussion-Conclusions

The importance of theater in education and the role of the teacher were presented in the literature review. Theater educators are required to be both scientists and educators. To be able to respond, their training is needed more than ever. This research focuses on whether theatrical teachers have the appropriate resources to cope with an ever-changing society but also with the growing professional needs of the modern school. The conclusions of the present study, however, cannot be generalized, due to the methodological approach chosen.

As Dewey (1986) points out, engaging in the art of theater is essentially experiential. The nature of the theatrical lesson is similar and thus unleashes creativity. So, the practical part of a training that theater educators mention is the one that will give them the necessary supplies. This aspect highlighted by the research of Flynn & Carr (1994) in which, they point out that using theater can enrich teachers' educational tools. The way, however, and the means should be well chosen, and in any case teachers should have the right direction from experts.

In terms of content, the critical issue of classroom management is in their first choices along with the management of students with special educational needs. Theater educators focus on psychology, effective communication, and developmental issues. It seems that a training program should not have a one-sided orientation but take into account the needs of teachers. As Gokmenoglu et al (2016) report, diversity, multiplicity and flexible forms are more effective in training programs.

Eight of the participants stated that they had participated in a training program in general, two of which answered that it did not help them at all while the other six answered that with what they learned in the program they enriched their knowledge. A training in the use of drama for educational purposes affects the professional development of teachers. This finding seems to agree with the research of Alexiou & Zourna (2016) which showed that training on the exploitation of drama as an educational tool worked positively, pushing teachers to take on more responsibilities and to participate in additional training programs concerning the subject.

As for the implementing host of training programs, the highest position is held by the public so that all theatre educators can participate without personal financial cost. A private host is preferred by the participants in cases where it is directly related to their interests, but also when there is no other solution.

For most participants a training, ideally, should take place during working hours. Lifelong learning is the basic preferred form for theater educators due to the experiential nature of the course. However, there are cases in which theater educators have expressed their preference for a mixed training model. The multifaceted role of the mixed learning mode is described in detail by Bonk & Graham (2006). As educational techniques and

technology evolve and progress the same should happen with training programs. The important contribution of the mixed training model is also presented in Greece. Research has shown that the largest percentage of teachers consider the mixed model to be a more efficient form of training (Vergidis, Anagnou, & Karantzis, 2010). Whatever the form, however, the training should reach the desired goal, development. This point of view underlined how important it is for a theater educator to participate in training programs even when he/she is far from the basic training centers. According to the participants, many of the theater educators do not have the opportunity to take part when serving in schools located outside the major cities where seminars and trainings take place. So distance participation can meet their educational needs.

Finally, regarding the duration a training program should have in order to be complete, the answers given, vary from two months to three years. What the participants agree on is that every training process should have an ongoing character, in order for the assimilation of new knowledge to be effective. This finding agrees with Jacob & Lefgren (2002) who state that the time dedicated to a training program is one of the determining factors for desired educational results.

Overall, we would say that theatrical education is a basically experiential lesson, which contributes to the comprehensive educational process. Teaching this subject by properly trained teachers improves students' abilities in such a way that they develop better relationships not only with themselves but also with all the people they meet. The profession of theater educator emerges as a valuable aid of education. Therefore their professional development should be in line with that of other teachers. For this reason, more emphasis should be placed on the educational needs that theater educators have and want to meet.

References

Anagnou, E. (2017). The headmaster-leader of Second Chance Schools. Retrieved from https://journal.educircle.gr/images/teuxos/2017/teuxos3/teyxos_5_3_4.pdf (in Greek)

Angrist, J. & Lavy, V. (2001). Does teacher training affect pupil learning? Evidence from matched comparisons in Jerusalem public schools. Journal of Labor Economics, 19(2), pp.343-369. Retrieved on 5/11/2019 from https://www.journals.uchicago.edu/doi/pdf/10.1086/319564

Alexiou, I. & Zourna, C. (2016). Teachers' professional competences: what has Drama in Education to offer? An empirical study in Greece. Professional Development in Education, 42(5):1-20. Retrieved on 2/11/2019 from http://www.tandfonline.com/loi/rjie20. DOI: 10.1080/19415257.2015.1127270.

Barbazette, J. (2006). Training needs assessment. Methods, tools and techniques. San Francisco, CA: Pfeiffer.

Bart, W. & Wong, M. (Eds.) (1974). Psychology of school learning: Views of the learner (Vol. 1:

Environmentalism). New York: MSS Information Corporation.

Bayrakci, M. (2009). In-service teacher training in Japan and Turkey: a comparative analysis of institutions and practices. Australian journal of teacher education, 34(1), pp.10-22. Retrieved on 22/12/2019 from http://dx.doi.org/10.14221/ajte.2009v34n1.2

Beaven, A. & Alvarez, I. (2014). Non-formal drama training for in-service language teachers. Scenario, 2014(1), pp.5-18. Retrieved on 4/11/2019 from http://scenario.ucc.ie

Bell, J. (2001). Methodological design of pedagogical and social research. Guide for students and PhD candidates (chapter 8). Gutenberg. Athens. (in Greek)

Bolton, G. (1985). Changes in Thinking about Drama in Education. Theory into Practice, 24(3), Educating through Drama (Summer, 1985), pp.151-157. Retrieved on 12/12/2019 from http://www.jstor.org/stable/1477034

Bonk, C, & Graham, C. (2006). The handbook of blended learning. Global perspectives, local designs. CA: Pfeiffer. Retrieved from: https://books.google.gr/books

Boyatzis, R. (1998). Transforming Qualitative Information: Thematic Analysis and Code Development (Chapter 1). Sage. USA. Retrieved from https://books.google.gr/books

Brown, V. (2017). Drama as a valuable learning medium in early childhood. Arts Education Policy Review, 118(3), pp.164-171. Retrieved on 2/11/2019 from http://www.tandfonline.com/loi/vaep20. DOI: 10.1080/10632913.2016.1244780

Cachia, R. & Ferrari, A. (2010). Creativity in Schools: A Survey of Teachers in Europe. Luxembourg: Publications Office of the European Union. ISBN 978-92-79-17535-0

Calderhead, J. & Shorrock, B. (2005). Understanding teacher education. Case studies in the professional development of beginning teachers. Retrieved on 1/11/2019 from Taylor & Francis e-Library. ISBN: 0-203- 26751-6

Clarke, V., Braun, V. & Hayfield, N. (2006). Thematic analysis in Qualitative Psychology: A Practical Guide to Research Methods (3d ed.), (Chapter 10). London. Sage. Retrieved on 13/4/2020 from http://www.informaworld.com/smpp/content~db=all~content=a795127197~frm=titlelink.

Creswell, J (2016). Research in education. Design, conduct and evaluation of quantitative and qualitative research (ed. In Greek X. Tsorbatzoudis). Athens: ION

Cohen, L., Manion, L. & Morrison, K. (2007). Reseach Methods in Education (6th edition). Taylor & Francis e-Library. Retrieved on 24/2/2020 from https://gtu.ge/Agro Lib/RESEARCH%20METHOD%20COHEN%20ok.pdf

Dawson, K., Cawthon, S. & Baker, S. (2011). Drama for Schools: teacher change in an applied theater professional development model. Research in Drama Education: The Journal of Applied Theater and performance, 16(3), pp.313-335. Retrieved on 5/11/2019 from http://dx.doi.org/10.1080/13569783.2011.589993

Dewey, J. (1958). Art as experience (chapter 1.). New York. Capricorn Books.

Dewey, J. (1986). Experience and Education. The Educational Forum, 50(3), pp.241-252. Retrieved on 21/11/2019 from http://dx.doi.org/10.1080/00131728609335764

Falasca, M. (2011). Barriers to adult learning: Bridging the gap. Australian Journal of Adult Learning, 51(3), pp.583-590. Retrieved on 4/3/2010 from https://eric.ed.gov/?id=EJ954482

Flannery, M. (1973). Aesthetic Education. Art Education, 26(5), pp. 10-14. Retrieved on 22/11/2020 from https://www.tandfonline.com/doi/abs/10.1080/00043125.1973.11652131?journalCode=uare20. Doi: 102307/3191840

Fleming, M. (2012). Teaching drama in primary and secondary schools. An integrated approach. Routhledge. ISBN 1-85346-688-3

Flynn, R. & Carr, G. (1994). Exploring Classroom Literature through Drama: A Specialist and a Teacher Collaborate. Language Arts, 71(1), THE ARTS (January 1994), pp. 38-43. Retrieved on 2/11/2019 from https://www.jstor.org/stable/41961930?seq=1&cid=pdf-reference

Gokmenoglu, T., Clark, C., & Kiraz, E. (2016). Professional Development Needs of Turkish Teachers in an Era of National Reforms. Australian Journal of Teacher Education, 41(1), pp.113-125. Retrieved on 30/10/2019 from http://ro.ecu.edu.au/ajte/vol41/iss1/7

Gould, D., Kelly, D., White, I. & Chidgey, J. (2004). Training needs analysis. A literature review and reappraisal. International Journal of Nursing Studies, 41(2004), pp.471–486. Doi:10.1016/j.ijnurstu.2003.12.003. Retrieved on 19/11/2019 from https://www.researchgate.net/publication/8584417

Grammatas, Th. (2001). Didactics of theater (in Greek). Athens: Tipothito

Gray, C., Pascoe, R., Wright, P. (2018). "I felt that I could be whatever I wanted": Pre-service drama teachers' prior experiences and beliefs about teaching drama. International Journal of Education & the Arts, 19(10). Retrieved from https://doi.org/10.18113/P8ijea1910

Greenwood, J. (2011). Aesthetic Learning, and Learning through the Aesthetic in Key Concepts in Theater/Drama Education (ed. Schommann). Rotterdam: Sense Publishers.

Hunt, G. (1986). Needs assessment in adult education: tactical and strategic considerations. Instructional Science, 15, pp.287-296. Retrieved on 17/2/2020 from https://link.springer.com/article/10.1007/BF00139616

Jacob, B. & Lefgren, L. (2002). The impact of teacher training on student achievement: Quasi- experimental evidence from school reform efforts in Chicago. NBER, Working Paper No. 8916.

James, W. B., & Gardner, D. L. (1995). Learning styles: Implications for distance learning. New Directions for Adult and Continuing Education, 1995(67), pp.19–31. Retrieved from https://onlinelibrary.wiley.com/doi/abs/10.1002/ace.36719956705. Doi:10.1002/ace.36719956705

Kaufman, R & English, F. (1976). Needs assessment: A guide to improve school district management. Arlington, Va: American Association of School Administrators.

Kotsiori, A. (2017). Art and education: The educational preferences of primary education teachers in the region of Athens. (Thesis, Hellenic Open University). (in Greek)..

Maslow, A. (1954). Motivation and personality. New York: Harper & Row, Publishers, Inc. Retrieved on 18/11/2019 from https://www.eyco.org/nuovo/wp-content/uploads/2016/09/Motivation-and-Personality-A.H.Maslow.pdf

Mason, J. (2003). Qualitative Researching (tr. E. Dimitriadou). (Ed. N. Kyriazi). Athens: Ellinika Grammata. (In Greek)

Mavropoulos, A., Sipitanmou, A. & Pampouri, A. (2109). Training of Adult Trainers: Implementation and Evaluation of a Higher Education Program in Greece. International Review of Research in Open and Distributed Learning, 20(1). Retrieved on 3/3/2020 from https://doi.org/10.7202/1057984ar (in Greek)

Mclauchlan, D. (2011). What makes a great high school drama teacher? In Key Concepts in Theater/Drama Education (ed. Schommann). Rotterdam: Sense Publishers.

Moore, M. & Dutton, P. (1978). Training needs analysis: review and critique. Academy of Management Review, 3(3). Retrieved on 21/11/2019. Doi.org/10.5465/amr.1978.4305749

O'Toole, J. (2005). The process of drama. Negotiating art and meaning. Taylor & Francis e-Library. ISBN 0-203-37217-4

Pavlou, Vasileios, Anagnou, Evaggelos, & Fragkoulis, Iosif. (2020), Training Needs of Primary School Theater Teachers: A Greek Case Study. In: Education Quarterly Reviews, Vol.3, No.4, 489-499.

Roland (2010) Preparing Art Teachers to Teach in a New Digital Landscape. Art Education. 63(1), pp.17-24. Retrieved on 4/11/2019 from: http://dx.doi.org/10.1080/00043125.2010.11519049

Schewe, M. (2013). Taking Stock and Looking Ahead: Drama Pedagogy as a Gateway to a Performative Teaching and Learning Culture. Scenario, 2013(1). Retrieved on 30/10/2019

Scriven, M. & Roth, J. (1990). Needs assessment. Evaluation practice, 11(2). Retrieved on 17/2/2020 from https://journals.sagepub.com/doi/abs/10.1177/109821409001100207

Sextou, P. (2002). Drama and theater in education in Greece: Past achievements, present demands and future possibilities. Research in Drama Education, 7(1), pp.93-101. Retrieved on 4/11/2019 from https://www.tandfonline.com/doi/abs/10.1080/13569780120113166?needAccess=true&journalCode=crde20. DOI: 10.1080/13569780120113166

Sfodouri, A. (2019). Opinions of Aesthetic Education teachers of the first grade about their problems and training needs. Investigate strategies to enhance participation in training. (Thesis, Hellenic Open University). (in Greek)

Shonmann, S. (2006). Theater as a Medium for Children and Young Observations People: Images and observations. The Netherlands: Springer.

Singh, H. (2003). Building blended learning programs. Educational Technology. 43(6). Pp.51-54. Retrieved on 6/11/2019

Stinson, M. (2009). 'Drama is like reversing everything': intervention research as teacher professional development. Research in Drama Education: The Journal of Applied Theater and Performance, 14(2). Pp.225- 243. DOI: 10.1080/13569780902868820. Retrieved on 8/11/2019

Szecsi, T. (2008). Teaching Strategies: Creative Drama in Preschool Curriculum: Teaching Strategies Implemented in Hungary. Childhood Education, 85(2). Pp.120-124. DOI: 10.1080/00094056.2009.10523078. Retrieved 4/11/2019

Tight, M. (2004). Key concepts in adult education and training. Taylor & Francis e-library. ISBN 0-203-74232-X

Tsarbopoulos, K. (2018). Investigation of training needs of Physical Education teachers of Primary Education in relation to the motivations that push them and the obstacles they encounter during their training. (Thesis, Hellenic Open University). (in Greek)

Vallack, J. (2015). Theater as education. AARE Conference, Western Australia. Retrieved on 8/12/2019

Vergidis, D. (2015). Teacher training in Greece as a dimension of educational policy. Retrieved from doi:https://doi.org/10.12681/sas.871 (in Greek)

Vergidis, D., Anagnou, E. & Karatzis, I. (2010). The contribution of the investigation of training needs to the training of teachers: Comparative Interpretation of Results. "Major Teacher Training Program. Retrieved from https://www.esos.gr/sites/default/files/articles/meletes-erevnes/ermineia-apotelesmaton-epiporfotikon-anagkon.pdf (in Greek)

Vergidis, D. & Karalis, A. (2008). Introduction to adult education (vol. C). Design, organization and evaluation of programs. Patras: Hellenic Open University. (In Greek)

Villegas-Reimers, E. (2003). Teacher professional development: an international review of the literature. Unesco: international institute for educational planning.

Wee, S. (2009). A Case Study of Drama Education Curriculum for Young Children in Early Childhood Programs. Journal of Research in Childhood Education. 23(4). P.p.489-501. Retrieved on 3/11/2019 from https://www.tandfonline.com/doi/abs/10.1080/02568540909594676

Weitz, M. (1972). What is Aesthetic Education? Educational Theater Journal. 24 (1). Pp.1-4. Retrieved on 22/11/2019 from http://www.jstor.org/stable/3205383

Wright, L. (1985). Preparing Teachers to Put Drama in the Classroom. Theory into Practice, 24(3), Educating through Drama (Summer, 1985), pp.205-210. Retrieved on 2/11/2019 from https://psycnet.apa.org/record/1986- 25756-001

Zorbala, M., Trouli, K. & Linardakis, M. (2015). Arts education in Greek universities for future kindergarten and primary school teachers: departmental programs and students' views. Preschool & primary education, 3(1), pp.34-52. Retrieved on 30/10/2019 from http://childeducation-journal.org (in Greek)

The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 61-70
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.174

The Future of French in Uganda in the Context of Language Policy Challenges: A Situational Analysis

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Abstract
In Uganda, publishing in French dates back to more than a century while its teaching dates from the early 1950s. Despite the position of English as the official language, French has for a long time been enjoying a privileged institutionalised position as a language of culture and a vehicle of international cooperation. French is offered as a foreign language at the secondary and tertiary levels of education and has been introduced in some private primary schools. Currently, however, French is facing language policy challenges in Uganda. One wonders how secure the future of French is in Uganda alongside the triumphant universal English language, the "national" flag bearer Kiswahili and the thunderous new arrival of Chinese. While choices between the indigenous, national and international languages are narrowing down, the promoters and developers of French must search for new niches for French as a language of inter-culturalism and interdependence.

Keywords: French as a Foreign language (FLE), Language Policy, Inter-Culturalism and Interdependence

Introduction

The history of French in Uganda can be traced to the origins of French missionary linguistics work in the Lake Victoria region in the "Annales Aequtoria" a highly reputed journal which was already documenting developments in the 19th and 20th century. For the same historical reasons, the earliest grammars and dictionaries with scientific ambitions documented between 1885 and 1921 on Ugandan indigenous languages were written in French. The five grammars and one dictionary can be traced to one collective authorship, the French Catholic Missionary Congregation of the "White Fathers". They arrived in the Lake Victoria region in 1879. It is no wonder then that the first published linguistic works from this region appeared in French (5 grammars) and Latin (one dictionary). They were reviewed in the work of Meeusen and Tucker in 1955.

Through the test of time, French in Uganda has kept its academic, cultural and moral traits of character. This is why in 1959, the De Bunsen Committee on Education recommended the use of English as the language of instruction (Scanlon, 1964) but at the same time encouraged the teaching of languages like French and Latin in

Uganda to balance the multilingual character of its communities, the nascent social and political pressures as well as the ambivalent attitudes of the communities towards English amidst the pre-independence multi-facetted uprisings and protests.

Shortly after independence, French was formally introduced in the early religious-based schools like Namilyango College, St. Mary's College Kisubi, King's College Buddo, Gayaza High School and later in government schools such as Nyakasura School, Ntare School and St. Joseph's College Ombachi. The added advantage of French was that it was considered by the Ministry of Education as a vehicle of cultural knowledge. It fitted well within the broad aims of the Ugandan education system which were "the eradication of illiteracy, promotion of scientific, technical and cultural knowledge, promotion of national unity and promotion of moral values" (Ayorekire and Twinomuhangi, 2010;1).

Ugandan Language Policies and implications for French

Within the 7(years)-4(years)-2(years)- system of primary, secondary (middle) school and high school education in Uganda, French is mainly taught in the latter two stages. It occupies the position of a foreign language as a subject in contrast with Spanish in the United States which is taught as a "world language", since it is the first language of some of its learners although they are learning it at school and regularly practice it at home. In contrast, French in Uganda may be the second, third or fourth language of its apprentices, and hence it's being taught as a Foreign Language. For the secondary (middle) school learners of French in Uganda, they will sit for 10-11 subjects out of the 21 subjects available. According to the education policy in place since 2020, English Language, Mathematics, Physics, Biology and Chemistry are compulsory. It is evident therefore, that English is accorded a policy advantage in comparison to French.

At the end of the high school or Advanced (A) level in Uganda, the categories of subjects to choose from are as follows:

Table 1: Categories of Subjects to choose at "A" Level

SUBJECT CATEGORY	
I. **General Paper** (Compulsory)	
II. Humanities P210 History P220 Economics P230 Entrepreneurship Education P235 Islamic Religious Education P245Christian Religious Education P250 Geography **III. Languages** P310 Literature in English P320 Kiswahili P330 French P340 German P350 Latin P360 Luganda P370 Arabic	**V Science Subjects** P510 Physics P515 Agriculture - Principles and Practice P525 Chemistry P530 Biology **VI. Cultural Subjects** P615 Art P629 Music P630 Clothing & Textile P640 Food & Nutrition
IV. Mathematical Subjects P425 Pure Mathematics P475 Subsidiary Mathematics	**VII. Technical subjects** P710 Geometrical & Mechanical Drawing P720 Technical Drawing P730 Woodwork P790Engineering Metalwork

Source: Uganda National Examinations' Board (UNEB) 2013

As is shown in Table 1, French finds itself placed in an unfavourable competition for a spot with the indigenous, national, regional and other international languages. Currently, it is taught in 397 institutions, by about 228 teachers and is offered as a subject by about 20,000 learners (New Vision, 21st December, 2020).

Swahili in the Uganda Educational System

Although Kiswahili (also interchangeably called Swahili) is in the same category in terms of being a selected and not compulsory subject, it is an official language of the African Union [1] and the East African Community economic block. It has also been proposed as a second national language of Uganda so as to help the country to integrate fully in the Eastern regional socio-political context. Kiswahili has a higher mutual intelligibility degree in relation to the Bantu languages which have a mother tongue status for many young learners and it is used as a lingua franca in many national and regional institutions such as the army, the police and prisons. It is also used for some regional activities such as sports, competitions, religious conventions, musical, cinema and cultural festivals.

Kiswahili literature is highly developed and is readily available for teaching purposes from neighbouring Kenya and Tanzania. In the new curriculum for Lower Secondary Education (2020), Kiswahili is a compulsory subject and its public is guaranteed. This therefore positions Kiswahili with familiarity and regional confidence in the Ugandan educational system even despite facing some degree of negative attitude from some cultural corners. To illustrate this, one can refer to the 1930s when Kiswahili was proposed as a language of instruction and in 1995 is was suggested as the national language in the then new Constitution but in both instances the recommendations never reached the implementation stage since it was campaigned against as "the language of the barracks". The negative campaign however has not diminished its regional aura and attraction as the vehicle of trans-border trade and the glue that is needed to seal the East African regional integration. Its popularity has been growing due to the spread of the social media version mixture with English (Sheng) that is used by many young learners. Kiswahili therefore is a serious contender when it comes to pushing for a spot in Ugandan national language policies.

Chinese in the Ugandan Education System

Chinese has arrived on the linguistic scene with the speed of "lightning" and power of "thunder". It is considered as the vehicle for development alternatives for a technologically advanced future Africa. Although it was first taught at the university level from 2014, having developed teaching capacity, it has spread like a storm to the secondary school level. In September 2016, it was approved to be included in the school curriculum by the National Curriculum Development Centre (NCDC). In December 2018 for instance, 35 schools were selected to teach Chinese as a compulsory subject for two years and thereafter as an optional subject (Daily Monitor, Dec. 23, 2018). This is a very privileged position for this language in the new curriculum for the lower secondary school launched in 2020.

The teachers for the 35 schools were taken for a special training after which they were deployed in the respective institutions. The initiative was supported by the Chinese Government which has supplied trainers with teaching materials and text books (Daily Monitor, Dec. 23, 2018). In addition to being facilitated for capacity building, these teachers who were selected by the Ministry of Education and Sports were recruited onto the government payroll at a much faster speed than teachers of French who have been in service for more than ten years but remain on the private list of the schools' Parent-Teacher Associations. In the Ugandan teaching policy context, being on the government list of the permanent and pensionable staff is a major motivational factor for teaching a subject. Chinese therefore may be the proverbial new "kid on the block" being additionally well-endowed, politically as a powerful new arrival that many schools are eager to try out as an innovation for the future. China is now a dominant economic power and its socio-political options are strongly seductive. The Chinese language

[1] Article 11 of the Protocol on Amendments to the Constitutive Act of the African Union states that the official languages of the Union and all its institutions shall be Arabic, English, French, Portuguese, Spanish, Kiswahili and any other African language.

in the Ugandan educational programmes has a different flair of internationalisation that is so appealing to young adventurous learners and business-curious parents.

A situational Analysis of the position of French in Uganda

The situational analysis of French presence in the Ugandan educational system, as recently as in 2013 shows that in that year, French had 2,718 candidates sitting for their end of the (middle) secondary level, as opposed to 2,732 in 2011. In comparison, at the high school level, in 2013, there were 746 candidates for the Advanced level, an increase from 657 in 2011 (Akello, 2013). Although there was a slight "decline" in the figures for the (middle) Ordinary secondary school level, the situation improved at the Advanced level. The "decline" which was heavily felt by teachers and students needs to be investigated for the period of 2014 - to date in order for it to be substantiated. What has been documented though, is the economic difficulties that hit the education sector in the 1980s, under the World Bank Structural Adjustment Programs, the government of Uganda was forced to limit some of the funding for higher education. Under the new conditions of the 1990s sponsorship for the humanities and the social sciences were shelved. A new policy of the "Private" sponsorship scheme was introduced in public universities such as Makerere University (1992) where one of the co-authors of this article was teaching. Indeed the number of students studying French at the university, particularly the beginners grew exponentially. In some groups we got up to 40 to 80 students enrolling.

At that time the following could be observed on the presence of French at the tertiary level:

Table 2: French Language presence in Ugandan Universities

INSTITUTION	AFFILIATION	Est.	A	F	C	S
Bugema University	Private (SDA)	1997				
Islamic University in Uganda	Private (Moslem)	1988	X	X		
Kabale University	Public	2002		X		X
Kampala International University	Private (FFor-profit	2000		X		
Kyambogo University,	Public	2002		X		
Makerere University	Public	1922	X	X	X	X
Makere University Business School	Public	1997		X		
Mbarara University of Science & Technology	Public					
Nkumba University	Private (For-profit)	1996		X		
Ndejje University	Private (Anglican)	1999				
Uganda Martyrs University	Private (Catholic)	1992	X	X		

Key: A=Arabic, F=French, C= Chinese, S= Kiswahili

Source: National Council for Higher Education (NCHE) 2011

Table 2 shows that French was being taught in both private and public universities at the time of the privatisation of university education. During the period of the new educational policy, undergraduate enrolment, for instance at Makerere University, more than quadrupled with about 80% of the new 10,000 students being fee-paying (Musisi & Muwanga, 2003). The same period also saw a rapid proliferation of private universities and by 2005, there were almost 70, 000 new students enrolling at various universities.

French at this time was faced with opportunities and challenges. At the university level, the subject was recruiting more enthusiasts since it was going beyond the classical programmes of Bachelor of Arts of education and of Social Sciences. The new 'private' programmes with a fee-paying component such as Bachelor of Tourism, Bachelor of Arts in Leisure and Hospitality Management, Bachelor of Secretarial Studies had integrated a component of French for Specific Purposes (FOS). At this level, French was entering new spheres where it had never been before. This was a new opportunity.

In contrast however, with the secondary schools' level (A Level), the selection criteria in 2011 was getting more restrictive since the number of subjects offered were reduced to three instead of four. Additionally, Computer

Science was made compulsory. All the students who had been offering three physical sciences or the humanities plus an elective French course could no longer add a fourth subject. This educational policy was so challenging that several schools which had very few students at the Advanced level (groups of less than 5) had to take the economic decision of dropping French. Some schools, like Gayaza High School, were innovative and allowed more flexibility in the subject combinations and hence got a reasonable number of candidates. Nonetheless, French as a subject lost out in the situations where the school administration was less flexible. Schools which dropped the French subject took up indigenous languages or Swahili.

However, during the recent advocacy encounter with school head teachers through the Association of Secondary School Head teachers in Uganda (ASSHU) with the Associations des Professeurs de français en Ouganda (APFO) and the National Curriculum Development Centre (NCDC) which took place in Kyambogo University on the 28th November 2020, it was noted that this situational analysis of French may soon be changing. At that sensitisation workshop, it was observed that the benefits of French as a United Nations, European Union and African Union language had never been discussed with Head teachers. Many of the head teachers from the districts bordering Rwanda, Burundi and the Democratic Republic of Congo were now realising the implications for their students. They noticed the impact for their employability and the potential for cross border business, for instance cultural tourism using French.

Underlying Pedagogical Issues

As was noted in the second section of this article, French was introduced in Uganda for teaching as a foreign language (FLE). It is worth noting that this pedagogical approach is not fixed in time and space. Indeed it has been observed that this is a discipline "within a field of constant reflection and rapid evolution" (Roux; 2014). Instead of waiting to react to circumstances which are turning unfavourable, teachers should position themselves as reflective practitioners seeking to reconcile pedagogical principles with pragmatism.

The policy difficulties surrounding French teaching in Uganda push us to rethink and propose strategies that are efficient, modern, effective and realistic, adapted to our context of teaching FLE in a non-francophone context. This demands adapting to the new phasing and phrasing of the educational and language policies. Within these moments of pedagogical change, one notes equally societal changes with regards to:
- Technological advances,
- The diversification of the receiving publics' profiles,
- The evolution in the learner's interests, behaviour, and positioning vis-à vis the subject,
- Emerging new studies in language pedagogy, applied psychology, and the cognitive sciences (Roux; 2014).

These changes have in turn led to a different positioning of written and oral French. Even in the Ugandan secondary and university programmes, teachers have passed from the literary classical language of whole works of Moliere, Victor Hugo, Leopold Sédar Senghor, Ahmadou Kouruma and Yambo Oulouguem[2] to the more every day, familiar, authentic sources for teaching. Extracts of a wide spectrum of authors today are more recommended. Translations of works in the immediate readership of the young learners in the official language, reproductions of texts from the indigenous languages, have all been accorded a mediator or facilitator role in the complex process of adding new knowledge.

At a time when the objectives of FLE are being redirected towards know-how skills, the learning of the target language's culture, and progression is more spiral, rather than the linear handling of content…etc., The focused teacher has to use the opportunity to review the expected outcomes and outputs. As advanced technology becomes relatively more accessible, French teaching in Uganda should aim at becoming more flexible and more learner-centred. The programmes and programing, the teaching aids, teacher training, multiple competencies, learning environment are all changing to suit the task-based learning approach.

[2] These are authors that were included in the French programs of the 1960s, 1970s, 1980s and 1990s. They are no longer popular. If at all they appear in a language curriculum, they are cited in generalities in form of extracts from past writings. Their works which used to be on the syllabus include *La Misère, Les Misérables, Nocturnes/ Liberté 1, Les Soleils des independences and Le Devoir de Violence* .

According to the data available at the Uganda National Examinations Board (UNEB), although French was not ranked high among the top six selected subjects at admission to public universities, it was ranked the second most popular one in the first year in private universities. Table 4 belows how the empirical data on that matter.

Table 4: Popularity of Subjects at admission to public universities

SN	Subject	No of Students at Admission	Percentage
1	Islamic Religious Education	334	2.8
2	Kiswahili	524	4.5
3	History	5194	44.1
4	Luganda	294	2.5
5	Christian Religious Education	3881	33.0
6	Fine Art	1540	13.1
Total		**11, 767**	**100**

In this Table 4, French does not feature among the most popular 5 subjects probably due to the fact that it is largely not government-sponsored There are also less schools offering French, (about 397 out of a total of 3,220 Uganda School Guide, 2020) and therefore offer lower chances of finding employment as compared to History, Christian and Islamic and Religious Education which are offered in most schools. Each school whether it is Christian or Islamic founded, will offer its brand of religious education. The regional and indigenous languages also have their fair share of space in the spot light according to the cultural tendency of its administration.

Table 5: Popularity of Subjects at admission to private universities

SN	Subject	No of Students at Admission	Percentage
1	Islamic Religious Education	142	1.9
2	French	68	1.0
3	Fine Art	2063	27.3
4	History	1502	19.8
5	Luganda	3792	50.0
Total	**Total**	**7567**	**100**

In the private schools the picture changes. The cultural tendency of the private school owners takes the upper hand taking the ranking of the indigenous very high. History, which has a tendency towards high performance and is offered in all schools still gets a good position as fine art which is comparatively popular. The religious influence once again also shows its impact. Behind the other subjects comes French, featuring most probably because of the internationalisation of private schools, especially near the bigger Kampala areas. The emerging trends therefore suggest that the private schools and universities would offer a more receptive environment for sensitisation, advocacy and lobbying. This points to the need especially of including the private universities in the training activities and interuniversity joint ventures.

In terms of the pedagogical lessons that can be drawn from this data, one can observe that the teacher of French and the institutions that support the teachers have to make reasoned choices that are coherent. This demands for a reflective approach to the new choices we are going to make so that we can compose with elements which will in turn lead to the improvement of the quality of outcomes and outputs. That is the pedagogical approach that will lead us to trainers and learners who are capable to think through their context and compose with what is efficient and relevant.

The involvement of approach demands also that the trainer and the leaner rethink and demystify the myths and fallacies that have been making the French language to lose ground in Uganda. These perceptions have evolved around the following points:

- The myth that French is a difficult subject,
- The fallacy that French lessons cannot be tailored to the learner's needs,
- The notion that French is a language for the rich and foreign diplomats and;
- The fallacy that there are no new niches for French in Uganda

French allegedly as a "difficult subject"?

Current research in education in Uganda tackles the issue of "difficult subjects". Connie Nshemereirwe (2014), a member of the African Association for Education Assessment worked on a study that was analysing the high school (A level) and university level. The universities on their part claim that the students coming from "A" level come in with low level of the requisite knowledge. But the students observed in the study that some of the curricula are out dated and not matched to national and learners' needs. In putting the two together, it was noted that it is the pedagogical approach of "teaching to the test" that is dominating Ugandan teaching and this leads to an emphasis on learning strategies, on the part of students, that lend themselves best to passing examinations such as memorisation and rote learning (Kellaghan & Greaney, 2004). These learning strategies do not lend themselves well to language education.

When performance at high school level and subject selection at admission to the university were cross-tabulated, it was observed that Economics which is way down low in terms of scores it the most popular subject selected both in the Arts and Sciences (Nshemereirwe, 2014) Though the subject would be categorised as "difficult" it was proved to be very popular. The study therefore noted that what is classed as "difficult" in reality reflected the perception of the students. With regards to French, the multi-dimensional analysis made did not validate the claim of the learners. In terms of relative difficulty, the study ranked it lower than physics, chemistry, Mathematics, biology, economics agriculture and literature. This shows therefore that the widely held view in Ugandan schools that French is difficult is more of a perception that has no empirical proof. Such research if disseminated can help teachers of French to better market the subject.

French lessons can not be tailored to the learner needs?

Another fallacy that has been doing the rounds is that French lessons cannot be tailored to the learner's needs. Those that subscribe to this view argue that French as a classical subject has its almost mathematical components of content that are delivered systematically as its prerequisites demand. Upholding such a view would be refuting the fact that even the recent interactive and intercultural approaches have shifted in order to accommodate the repositioning of learner's needs. The current programmes of French for tourism, French for Administration and Management, French for Statistics, French for Human Rights and Democracy that are organised respectively for the students of Leisure and Hospitality, Business Administration and Management, Applied Statistics and Population Studies and Masters in Human Rights and Democracy show that a French for Specific Purposes (FOS) approach can work for specific target groups. The classes conducted outside the humanities at the university level offer some of the most accomplished achievements.

Efforts are being made to refine and contextualise such programmes and to provide new content for such programmes of French for Specific purposes. These efforts are aimed at making French more appealing and more practical to the learners in other disciplines who are active professionals in their respective fields.

Indeed even centres outside the universities that have been adopting this approach have been very competitive. Language and cultural centres like the Alliance Française de Kampala (AFK) which are running classes for journalists and tour guides are equally moving away from the drill-based strategies. Focusing on speaking, listening, reading and writing competencies in that order while allowing students to cross check individually outside the limited class hours has a potential of increasing the student's autonomy.

French is a luxury for the rich and the foreign diplomats?

Despite the advantages of knowing a second language, several Ugandans, like Martin Musoke, in an online interview, believe "it is a luxury for rich and foreign diplomats". Nonetheless, for those who have understood that "French is fast becoming a global language in regional and international integration; Uganda is grabbing the opportunity not only for linguistic but also for economic reasons" (Akello, 2014). The International Francophone Organization (OIF) recorded a population of nearly 96.2 million Francophones on the African continent, among whom are the neighbouring Congolese, Rwandans and Burundians. It is henceforth worth the value the learner

invests to acquire proficiency in French. These learners have realised that it opens doors for trans-border, regional, global and unlimited virtual spaces not only for linguistic but for economic or trade or other reasons. A bilingual lawyer or evangelist stands a chance of grabbing spontaneous opportunity online without waiting for someone to translate the email or the announcement bearing the message. Daniel Kagwa, a student at AFK put this beautifully when he said: "My parents pay my fees because they know the advantages of this third language. It raises my profile for the job market and would ease my communication if I were to travel" D. Kagwa, (student at AFK, in an online interview, 2015). Clearly, Daniel's parents do not have to be rich or serving any diplomatic mission, what they have harnessed, is the information that gives you an advantage as an enlightened parent of a French learner.

Another parent added: "language creates pathways in the brain which makes it easier for kids to learn more complicated subjects" (Killeen Royce, parent of a primary 2 student, in an online interview, 2015). This parent clearly makes a case whereby paying for a language class holds the key to unlocking the capacity of French as a language of research, technological advances and innovations.

There are no new niches for French in Uganda?

Apart from the new French for specific purposes programmes where the language has been introduced in new disciplines at the tertiary level, there are new niches for the language where sensitisation or advocacy has not yet been done or is still inadequate. Private schools and universities which hitherto had not been considered for institutional support by developers of the French language can be recruited as promoters of this vehicle of cultural exchange and international knowledge. Given that they already have students from the East African Community and the African Great Lakes Region, they are more predisposed to curriculum reviews that can subsequently incorporate the French subject. Schools like Umoja International School, Taibah International School, Vienna College Namugongo, Hanna Mixed Secondary School or Agha Khan High School which offer Cambridge International Examinations and French as their second compulsory language. They have sustained the image of French as a modern, efficient and trendy subject. This points to the fact that more advocacy work needs to be done with private schools to include French in their packages.

Similarly, new options of offering French as an "audited subject" that is reflected on the student's transcript have proven effective when they were introduced in higher institutions such as Makerere University. The student remains in his/her major side of his/her programme but attends the French lectures where possible. The number of attended hours and the course work assignments done, plus the final test score to be taken at the end of course suffice for the student to get her/his university certification. This option is becoming even more virtually accessible as more universities "onlinise" their course content and open up to e-learning. Proposal for negotiating a secondary school equivalent for student who do not wish to study French go sit for for examinations at the high school level are under way. It is hoped that this will widen the profile of "auditeurs libres" of French (independent French audited course learners).

Located at the centre of a "plaque tournant" or a hot spot prone to conflict, Uganda is host to about 1 505 323 refugees who live in 30 camps around the country. Many of them are fleeing from conflicts or civil wars and unrest. They are coming from South -Sudan, the Democratic Republic of Congo (le RDC) and Burundi (Office of the Prime Minister and UNHCR, 2018; Relief Web, 2018).

More recently Kampala and some other cities in Uganda have started receiving urban refugees who have picked interest in French as part of their non-formal education (NFE). Uganda as the host country can develop capacity to make use of the opportunity of new programmes that can be mounted and negotiated with the relevant institutions catering for refugees coming for the neighbouring francophone countries. NFE programme have been developed for psycho-social support, income generation activities and preparing the individual for self-reliance upon returning home. The NFE programmes are designed to tap into the existing potential of the refugee population. They are very important for regional security since they keep the concerned population from the risk of recruitment into dangerous criminal activities. (Sommers, UNHCR, 2003).

There are also many other forms of cultural cooperation that hitherto are inadequately explored in Uganda. Apart from the sessions in French Cuisine, concerts with French artists, there are also opportunities through football, fencing, dance**,** drama and film which can bring together enthusiasts who wish to compose, play and enjoy performing arts together. These could be accompanied with language workshops that eventually develop into annual language academies.

Conclusion

French has a long standing historical link with the Lake Victoria region. It arrived with the White Fathers Missionaries and went on to be the publishing language of the pioneer grammars and dictionaries of the indigenous languages that could claim a scientific ambition. French has maintained that cultural and moral advocacy function in Uganda and in addition, it has been integrated in many disciplines and professions. The fact that it is offered in around three hundred schools and universities makes it quite a popular subject and a serious contender for serving as a vehicle for trans-border trade, regional integration, cultural exchange, and international cooperation.

We noted that French opens the doors to the internationalisation of educational programmes. This will only be successful if the teaching of the target culture is made more enjoyable through innovative teaching methods. While taking advantage of technological advances the future teacher of French can make his or her curriculum more learner-centred so as to unlock the potential to use French for more autonomous learning and creativity.

The future of teaching French in Uganda will have to make more space for indigenous language since they act as a trampoline for self-discovery and comparative cultural study. Since our study did not observe any empirical data of French as a vehicle of political domination, the future French learning can be envisaged as a language of interdependence.

In the very near future, efforts have to be focused on exploring new niches of French in Uganda so as to diversify the profiles of its publics. This demands re-orienting teacher training, purchase of new teaching materials, new programming and change of teachers and learners attitude. Future efforts to publish local content that will serve as a source of authentic materials to be infused as a supplement into the official curriculum will greatly enhance the contribution of Ugandan teachers and the presence of its cultures in French teaching. So as the French language will continue to be taught as a foreign language, it will nonetheless have a content that blends well with the social context and the re-oriented teaching environment. Teaching of French, when it has changed and adapted itself to the new conditions, will cope with the challenges of new language policies and competition with the other indigenous, regional and international languages

References

Akello, J. (2013). More Ugandans Learning French," The Independent, April 2, 2013.

Ayla B. (2010); Learning Outside the Classroom: Non -formal education in Uganda, *New Issues in Refugee Research*, Research Paper No.193. November 2010 International Migration Institute, University of Oxford.

Ayorekire J and Twinomuhangi R (2010).Udanda: Educational Reform, the Rural -Urban Digital Divide, and the Prospectsof GIS inSchools" in A.J. Milson et Al (Eds) *International Prespectives on Teaching and Learning with GIS in Schools*, Springler Science and Business Media B.V.201

Kellaghan T., and Greaney V., (2004), *Assessing Student Learning in Africa*. World Bank, Washington.

Meeuwis, M, (1999). The White Fathers and Luganda;To The Origins of French Missionary Linguistics in the Lake Victoria Region, In *Annales Aequatoria*, Vol. 20 (1999), pp. 413-443 (31 pages), Published By: Honoré Vinck

Musisi, B. N & Muwanga, K. N., (2003), *Makerere University in Transition 1993–2000: Opportunities & Challenges*, Makerere University, retrieved 22 May 2011 <http://mak.ac.ug/documents/Makfiles/pdf/2003_05_20_N.B.Musisi_et_al_uganda.pdf.>

New Vision: “First Lady, French Ambassador Discuss Cooperation in Education”. The New Vision, 21st December 2020.

Nshemereirwe, C. V. (2014), Estimating the Difficulty of A’Level Examination Subjects in Uganda,https://www.researchgate.net/publication/302401844_ESTIMATING_THE_DIFFICULTY_OF_A'LEVEL_EXAMINATION_SUBJECTS_IN_UGANDA

Nshemereirwe, C. V (2011) Characterising Entrants into the University System in Uganda, http://ir.umu.ac.ug/handle/20.500.12280/366

Roux P.Y. (2014). L’Enseignement du Francais Langue Etrangere: Entre Principes et Pragmatisme, https://salledesprofs.org/lenseignement-du-francais-langue-etrangere-entre-principes-et-pragmatisme/ 11 juin 2014.

Scanlon D., (1964). *Education in Uganda*, U.S. Department of Health, *Education* and Welfare, Office of *Education*, 1964.

School Guide Uganda Limited, 2020; https://ugandaschools.guide/find-a-school/category/3#

The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 71-84
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.175

Teacher Preparation by Universities: Internal Stakeholders Perception of Teacher Education Curriculum Content in Makerere and Kyambogo Universities

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Abstract
Developing a teacher education curricular content is an enduring concern for teacher educators. A continuous method to providing quality teacher education curriculum content discloses the potential for teacher educators to produce high-quality teachers. Drawing on data from twenty teacher educators and sixteen student teachers in public institutions in Uganda, this article explored the perceptions of the teacher education curriculum content held by academic staff and student teachers in public Universities in Uganda. Using Pedagogical Content Knowledge Model as a tentative model of teacher preparation and Constructivism theory as an interpretive framework, the study was guided by one objective namely: (1) to analyze the perception of internal stakeholders about teacher education curriculum content offered in Makerere and Kyambogo Universities. This research adopted a qualitative, multiple case study design that was anchored in the interpretivist paradigm and directed by the social constructivism thinking. Data were collected using semi-structured interviews were participants from twenty teacher educators and sixteen student teachers who were purposively and conveniently selected. It was therefore concluded that both lecturers and student teachers viewed teacher education curriculum content positively viewing it as enabling learners to be equipped with specialized teaching skills, essentially directed towards teaching profession. Thus, recommendations to improve the stakeholder perception of the teacher education curriculum content are made and these include: teacher education curriculum review and the need to design a 21st-century teacher education curriculum by teacher trainers in corroboration with other university units rendering a training service to teacher trainees. This would bridge the gap of the disjointed teacher education curriculum content at Makerere and Kyambogo Universities hence strengthening the building blocks that produce a teacher.

Keywords: Curriculum, Internal-Stakeholder, Pre-Service Teacher, Teacher Education

1. Introduction

In recent years, the quality of teacher education curriculum has been a focus of concern in debates about the teacher education programme (See e.g., Mkandawire, Maulidi, Sitima and Luo, 2018; Ballard & Dymond, 2017;

Gholami and Qurbanzada, 2016). This curriculum has been based on the idea that after 'acquiring' theoretical knowledge through courses done at the college/university, student teachers are able to 'apply' this knowledge to their teaching at the schools (Srinivasan, 2016). Indeed, teacher education curriculum content is organized along the following components—foundation courses, subject content and pedagogy courses and school teaching experience. This enhances quality of teacher preparation programs by identifying inter-related competencies needed for the role of educating teachers. Competencies such as in content, pedagogy, group dynamics and communication, development and personal growth, plus organizational competencies (Goodwin et al, 2014). Similarly, Shulman (1987) continues to illustrate that the competencies teacher must embrace for their effectiveness that included: (1) knowledge of subject matter, (2) general pedagogical knowledge, (3) pedagogical content knowledge, (4) knowledge of curriculum, (5) knowledge of learners and their characteristics, (6) knowledge of educational contexts, and (7) knowledge of educational ends. In this context, Herold and Waring (2009) advances that content knowledge is defined as the subject-specific knowledge needed by the teacher to deliver specific curriculum requirements related to the subject in concern.

Although, student teachers gain knowledge about their specific subjects like history, math chemistry among others (called general training) together with knowledge that is relevant for teaching, like teaching methods or classroom management (called professional training) in teacher training. The first priority in this preparation process is students' attendance to subject courses (Lohse-Bossenz, Kunina-Habenicht, & Kunter, 2013). As Herold and Waring (2009) notes, "how much, and what type of subject matter content is needed, and what are the consequences for pre-service teachers is important during teacher preparation". The impact of subject matter content exposed to pre-service teachers should be worthy of more detailed consideration (Herold and Waring, 2009). Considering and managing the impact of various content implies that subject content is the first source of knowledge base (Shulman (1986, 7). Despite these structural differences, it is obvious that besides subject content and subject teaching methods, non-subject-specific courses are considered an integral part of teacher education (Lohse-Bossenz, Kunina-Habenicht, & Kunter, 2013). Similarly, the time period necessary to fully prepare persons for the teaching profession, that is, from the decision to become a teacher to becoming a fully responsible is well-thought-out (Lohse-Bossenz et al, 2013). Because the teacher educators' interest lies in preparing pre-service teachers effectively for the classroom (Bourke and Lidstone, 2015). Since teacher educating is not merely engaging in the act of instructing or developing preservice. Rather, it is a purposeful commitment to a professional life that is centered on the teaching of teachers and a deep understanding of what it means to teach about teaching (Goodwin, Smith, Souto-Manning, Cheruvu, Tan, Reed, & Taveras, 2014). Thus, strengthening Nenty and Sello's (2017) perception that teaching is the first among all nation-building professions. Members of all other professions are built or trained by teachers (Kagoda and Itaaga, 2013 & Nenty and Sello, 2017) and therefore subject content that prepares preservice teachers to learn and implement classroom activities first requires a solid base (Mkandawire et al 2018). The aim of this study, therefore, is to empirically highlight internal stakeholders' perception within general teacher education content areas. By specifying broad teacher education content areas with concrete issues, we can contribute essentially to the development of curricula that can be considered relevant for student teacher.

1.1 Problem

Training teacher trainees at Makerere and Kyambogo Universities seem to be complicated in that the building blocks that produce a teacher are disjointed (Kagoda, 2018; Otaala, 2013a; Otaala, 2013b; Kagoda & Najjuma, 2013; Kagoda & Itaaga, 2013; and Kagoda (2019). For example, within the teacher preparation content, School of Education (Makerere University) and Faculty of Education (Kyambogo University), offers the professional teacher education course units while content for the disciplines is offered by other colleges (for Makerere University) Kagoda and Najjuma (2013) and faculties (for Kyambogo). This has raised many criticisms on how universities are training teachers (Otaala et al, 2013a). As a result, at Makerere and Kyambogo universities, teacher education curriculum has faced serious criticisms from society especially teacher employers. For instance, Otaala et al (2013b) reports that the public has always expressed dissatisfaction with the teacher graduates from Kyambogo University, something that directly and indirectly expresses dissatisfaction with the university teacher education curriculum. Similarly, at Makerere University, teacher trainees do not seem to have

enough time to be effectively trained in the teacher course content (Kagoda and Katabaro, 2013; Kagoda, 2019), inculcating a believe that School of Education, College of Education and External Studies, Makerere University is not adequately preparing teacher trainees to meet the demands and needs of secondary school curriculum (Kagoda and Itaaga 2013). Underlying to this discussion is a sincerity that if external stakeholders have been complaining about teacher education curriculum content, what do student teachers think? And we also do not know much about what teacher educators who implement teacher education curriculum content think. This study, therefore, falls within this knowledge gap and dilemma to explore the perceptions internal stakeholders (teacher educators and student teachers) have about teacher education curriculum content in Makerere and Kyambogo Universities.

1.2 Study Objectives

The study was guided by a sole objective, namely:
To analyze the perception of internal stakeholders about teacher education curriculum content offered in Makerere and Kyambogo Universities.

2. Related Literature

Preparing teachers to enact core practices requires a sea change in the practice of teacher education. This raises concerns that to be relevant to the contemporary landscape of teacher education, any framework for learning to engage in the core practices must also attend to the contemporary organization of teacher education programs (McDonald, Kazemi & Kavanagh, 2013). This therefore calls for the initial teacher training to comprise the time period necessary to fully prepare persons for the teaching profession, that is, from the decision to become a teacher to becoming a fully responsible member of the teaching profession (Hendrik, Olga, and Mareike, 2013). Likewise, (Hollins, 2011) asserts that teacher education curriculum must be given time to be diagnosed well for one not to affect it negatively. The curriculum designers as the greatest aid to learning are the most important instrument and they need to know the basic principles that include demand, integration of theory and practice, school/classroom focus, competency and process assessment (Asare & Nti, 2014). This is in consonance with Kim, Ham & Paine (2011), who observe that when analyzing the curricula of teacher preparation programs, you find that content is influenced not only by social expectations in particular socio-historical contexts but also by evolving transnational discourses on education.

Besides subject content specialties, a significant body of literature (Kagoda & Itaaga, 2013; Kagoda & Sentongo, 2015; Otaala, 2013a; Otaala, 2013b) concludes that above and beyond training of teachers, non-subject-specific courses are considered an integral part of teacher education. These courses are mostly called educational foundations, which tend to include history of education, sociology of education or educational psychology (Hendrik, Olga, and Mareike, 2013). This observation is congruent with the view further advanced by Van Driel and Berry (2012) who opines that programs of teacher education usually include method courses. Indeed, Hendrik, Olga, and Mareike (2013) found that useful knowledge for teachers is mostly located at the level of content area. However, despite the reputation of the courses making up teacher education geared towards quality teacher, Hsieh, Law, Shy, Sang, Hsieh and Tang (2011) warns that future teachers are less approving the courses/content arrangement of teacher education programs than program educators, thus perhaps lowering educator's motivation to improve the arrangement.

However, this kind of gap in the said efforts further widens the prospective of the most fluent explanations of teacher educators, policy makers, curriculum designer, managers among other stakeholders in the aforementioned scenario to start asking themselves which course to offer first and which one to give last. A leaf from the foregoing presupposes that there appears to be a great deal of agreement that introductory courses provide an overview of the profession especially in the areas of history and philosophy (Mishra, Day, Little and Vandwalker, 2011). As Kim et al (2011) for instance argued that curricular courses provide likely teachers with various opportunities to acquire useful, practical knowledge. Therefore, one assumes that introductory classes set

the stage for content and skills developed during pre-service teacher training, and have the potential for being the keystone of the degree program and the foundation of a teaching career (Mishra et al, 2011).

The other critical components underlying teacher education preparation revolves around coherence and integration, extensive and intense supervision of clinical work integrated with course work using pedagogies that link theory and practice (Darling-Hammond, 2006). However, since of late, most of the teacher education courses geared towards theory base failing to link to practical. Moreover, many curricular contents in teacher education preparation are theory-based, a factor that sometimes drive the curricula content of teacher education to a different direction (Kim et al, 2011). Yet, on contrary, some authors like Zeinchner, Payne & Brayko (2014) noted that the practice should be that candidates learn what and how to teach in their courses and then go out and apply what is learned in schools during their field experience.

Furthermore, review of literature suggests that many researchers invested in writings showing the perceptions of stakeholders about the teacher education curriculum content in the context of higher education (See e.g. Olson, Laidlaw & Steel, 2016; Hassan, Maharoff & Abiddin, 2015; Petersen, 2015; Meegan, Dunning & Belton, 2013). For instance, Olson et al, (2016) carried out a qualitative empirical study to establish pre-service health and physical education teachers' reflection on the skill acquisition and a new curriculum in Austria and found out that pre- service teachers described the quality of the university teaching and the structure of the curriculum to matter a lot more than the number of units to be taught, hence perceived importance. Hassan et al, (2015) in their study aimed at investigating teacher trainers' and trainee teachers' understanding towards the curriculum philosophy regarding soft skills embedment in the Malaysian institute of teacher education discovered that it was the responsibility of the lecturers in Malaysian institute of teacher education to ensure that all student-teachers acquire the knowledge and skills required by a prospective teacher. Meanwhile, Meegan et al (2013) on their part, concluded that cooperating physical education teacher education programme provides a helpful and structured framework for the role of university supervisor.

In general, the literature cited herein indicates that for any teacher preparation to meet its core, it must have a capacity to have a sound teacher education curriculum content which would make such a program deliver teacher products that would be perceived as of good quality. Thus, such major indicators formed the criteria under which internal stakeholders perceive teacher education curriculum content at Makerere and Kyambogo Universities.

3. Theoretical Consideration

The researchers used a theory and model: Pedagogical Content Knowledge Model developed by Shulman (1986, 1987) and the Constructivism theory by Piaget and Vygotsky (1978) as guides to analyze internal stakeholders' perception of teacher education curriculum content at Makerere and Kyambogo Universities. Rationale for this model is based on the reality that it incorporates all the elements of teacher quality resulted from appropriate teacher education preparation (Okpala, Rotich-Tanui, & Ardley, 2009). The second assumption of the model is that whatever teachers know about teaching, such as the use of concrete examples and manipulative, design of curriculum comprises pedagogical content knowledge (Cochran et al, 1991). Thus, the model refers to the knowledge teachers use to translate particular subject matter to students, taking into account possible (mis)conceptions (Depaepe, Verschaffel & Kelchtermans, 2013). According to this model, it's believed that teacher education curriculum content with appropriate components of curricular content, as illustrated by Shulman (1986,7), have potential to transform stakeholders' beliefs that the teacher preparation program in Makerere and Kyambogo Universities may perhaps fully prepare quality teachers with necessary skills, knowledge, innovativeness, creativity among others.

More succinct to the foregoing rationale are Clark, Byrnes and Sudweek (2015), as they observe that preservice teachers enter the teacher preparation programs with a variety of classroom and educational experiences of their own that can further influence and/or inhibit what they learn within the teacher preparation programs, in addition to the situated learning environment provided by teacher preparation programs with specific content, along with

varying degrees and types of field-based experiences. To them, one way to measure the influence of teacher preparation programs, and the teacher training context, is to explore the perceptions teacher educators and student teachers have about teacher education curriculum content. This basing on the model may enable stakeholders see and interpret the teacher education curriculum content in deeper and broader perspective - a presumption that this study intends to confirm. For constructivism theory, it provides a framework for the interpretation of teacher educators and student teachers' perceptions of teacher education curriculum content since human perception is always seen as a 'construct', a product of the human mind, developed out of their experiences-meaning directed toward convinced stuff. As such, stakeholders' interaction with the teacher education curriculum content, their explanation and interpretation of the teacher education curriculum content will depend on an individual, which would constitute their unique perception derived from their own experience (Weber, 2004) of the curriculum content. Grounding on this, it reminds university teacher education curriculum designers to apply a model/ approaches that lead teacher educators and student teachers to understand teacher preparation program deeply and view its content and process as inseparable aspects of knowledge construction. Consequently, based on the stated model and a theory, the researchers demonstrate in this study that the construction of content would be perceived positively as achieving learning ends and the reverse will be true.

4. Methodology

4.1 Research design

The study adopted a descriptive multiple case study design (Makerere and Kyambogo Universities). It was a multiple case study as it zeroed on Makerere and Kyambogo Universities and concentrated on in- depth understanding of the perceptions of the teacher education curriculum content held by teacher educators and student teachers. This study provided findings drawn predominantly from the qualitative thematic data analysis of data collected. A purely qualitative approach was preferred because the study sought teacher trainers' and trainees' perception about the teacher education curriculum. Research took place within the premises of the School of Education, College of Education and External Studies, Makerere University and in the Faculty of Education, Science, Vocational studies, and Art and Social Science, Kyambogo University.

4.2 Instruments

The data were collected using semi-structured in-depth interviews. This means open-ended questions were used in order to yield in-depth answers about perceptions of the teacher trainers and trainees. The trainers and trainees were purposively and conveniently selected and interviewed by the researchers themselves. Data were also collected through a critical read-through and reviewing of the relevant documents such as the university strategic plans, government white paper on education (GoU, 1992), teacher education policy, national council for higher education, teacher education curriculum, University and other tertiary act. This aimed at checking the core issues that were related to teacher education curriculum.

4.3 Trustworthiness

The validity of the tool and reliability of the results were ensured by using a wide sample across the two study institutions. In addition to attaining trustworthiness as a conceptual soundness or value of qualitative research. To this effect, peer debriefing, prolonged engagement, and peer review checks were ensured, as well as the focusing on the questions for the interview.

4.4 Data Analysis

Data was analyzed using descriptive and interpretive analysis. Interpretive analysis aimed at a view that knowledge is more dynamic an assumption that individuals use to seek and understand the world in which they live and work (Creswell, 2003). Thus, developing subjective meanings of their experiences-meanings directed toward certain stuff, which are multiple in natures of which this study was interested in. For instance, the issue

of teacher education curriculum content was interpreted amongst teacher trainers and trainees using different lenses rendering teacher education curriculum content to be subjective in nature. Interpretive analysis was therefore aimed at presenting interpretation of the perceptions as comprehended by participants.

The data was then organized and categorized guided by the research questions, to enable the identification of themes and emerging patterns. Data coding was done and it helped in easy identification of data during reference and analysis, avoiding to lose the participants' data. Further analysis involved searching for thematic connections within and across the transcripts. Developed thematic data enabled the study to systematically identify, organize and develop insights into patterns of meaning across the data obtained to get deeper indulgent of teacher education curriculum content at Makerere and Kyambogo Universities.

5. Findings

In order to ascertain the teacher training at Makerere and Kyambogo Universities, study participants were asked to explain how they perceived teacher education curriculum content offered. The aim was to explore participants' perception of the teacher education curriculum content in terms of its relevance in respect to career aspiration for teacher trainees. Following the objective of this study, the perceptions of the teacher education curriculum content held by academic staff and student teachers, was that it offers professionalism (i.e., qualification for teaching and equipping teachers with specialized skills) and teaching methodology (i.e., equipping teachers with teaching skill as well as offering approaches to teaching) to teacher trainees. Each of these aspects are presented and discussed concurrently.

5.1 Offers professionalism

First, findings from both teacher trainees and their lecturers agree that ideally, they perceive teacher education curriculum content as offering professionalism to teacher trainees. For instance, across departments at Makerere and Kyambogo Universities, participants perceived teacher education curriculum content as a teacher education component intended to instill professionalism among student teachers. Indeed, the majority of the participants expressed that they view course content relevance as one that gives teachers ability to meet their daily activities of teaching qualifying them for teaching as well as equipping them with specialized skills. These are further discussed below.

5.1.1 Qualification for teaching.

Participants from study Universities were asked to reflect on the perceptions they hold on the course content taught to teacher trainees who end up teaching the secondary school curriculum. In support of the foregoing, a perceptible number of the participants in the study credited the teacher education course content student teachers cover to be highly okay because the courses were designed and developed in view of the academic content at secondary school level: the responses from teacher educators were as follows from Makerere University:

> *I perceive the course content to be very important to teacher trainee and that there is a lot of relevancy in it since it's geared towards helping student teachers in the field of teaching. We teach this content to our students so that they do not find problems in the field when they finish the program. (Science teacher educator2)*
>
> *Besides courses being designed for training program, they are very important and very relevant to pre-service teachers because it rhymes with the secondary school curriculum and of course it gives them much more than what is embedded in the secondary school curriculum. Secondly, it also prepares them for higher degrees in case they are to come back. So, the teacher education curriculum content is relevant for the pre-service teacher (Arts teacher educator3).*

These sentiments are in agreement with the teacher educators from Kyambogo University who added that course content like teaching methods, curriculum studies and foundation units offered to student teachers have a positive related relevancy. They cited that the course content makes students all-round, in addition to being a

prerequisite meant to prepare student teachers to go and do the teaching. Two educators from Faculty of Arts and Social Science and three from Faculty of Science responded that:

> *The courses expose our students here to methods of teaching. In this case we deal with a lot of things, first of all, we begin to see how we prepare them to teach taking them through stages of preparation such as mental preparation. Secondly, we guide them on how to make schemes of work and lesson plans among other requirements for teaching (Art teacher educator2)*
>
> *Literature education is a course which is very important, it is a requirement before we send our graduates to go and teach. They need to have the skills to handle the content that they will be delivering to the students in the secondary schools. This is a course that provides them with the methodology, practical skills, techniques, theoretical groundings to be able to deliver the content that they have acquired in the university. So, I consider this course content to be very important for them as teacher trainees so that as they finish the university studies, they can deliver the content to students in the secondary schools. (Arts teacher educator1)*
>
> *When a teacher has been trained in our courses of chemistry which I teach, he knows what to do in organic and inorganic at both "O" and "A" level because we train them everything which is involved. So, my perception towards this course is that it prepares student teachers for the teaching activities. (Science teacher educator4)*
>
> *Course content is a core to me, it is the practical part of the profession for one to be a teacher. Even to student teachers who come to the program with adverse attitudes end up loving it when subjected to course units like methods of teaching physics (Physics education). Therefore, there is a way this positively pulls student teachers towards the profession (Science teacher educator1)*
>
> *I think biology education is a necessary course, very vital if they have to go out there and become biology teachers. It is very relevant as long as they are going into education because it is not only knowing the content but even how to deliver the content to the learners so that the learners could understand. There is knowing the content but delivering it is also very important (Science teacher educator5).*

The responses above indicate that teacher education curriculum content is perceived as a criterion to which one has to go through so as to be empowered to teach. To confirm this in the process of teacher preparation, the researchers further interviewed teacher trainees from the respective institutions under study. Teacher trainees' responses from Makerere University are:

> *Most of the foundation courses concerning teaching are applicable especially curriculum. It is helpful to me as a teacher because the many things am studying, are going to help me during teaching, for instance, the assessment of the students and the content delivery, the methods we use when teaching especially choosing the right methods which can cater for every student including those with disability (arts trainee2)*
>
> *I think the course content taught to us as student teachers is okay. For example, what I am taught in physics is applied in our daily life. So, when am trained in physics as a teacher, I can do other jobs outside the teaching profession but related to physics because physics covers a lot, including electrical engineering. So, I hold a positive perception towards my subject of specialization (Science trainee3)*

Equally, teacher trainees from Kyambogo University too shared their perceptions of the teacher education content as well. In carrying out this, it was to confirm the assertion obtained from educators from Makerere and Kyambogo Universities on how they observe teacher education curriculum content as offered. This is what two teacher trainees (one arts trainee and one science trainee) asserted when asked how they thought about the curricula content taught to them

> *As an individual, I am going to base on the teaching methods. It is good for our course as teachers because when we are going to school practice, they teach us the teaching methods in our respective subjects of specialization. These help us to make our files, in addition to learning to organize things like lesson plans and schemes of work (arts trainee1).*
>
> *I hold a positive attitude towards all the course content taught to us as teacher trainees. This is due to the fact that when I went for my first school practice, I did not find any challenge with the teaching*

activities that were allocated to me because of the work exposure we get here at university (science trainee1).

In another perspective from teacher trainers and trainees, although participants across the institutions, fields, departments and ranks perceived teacher education course content as a requirement for teacher preparation, some had misgivings as well, especially teacher trainees complained about the heavy course load and broad, some relevant but not applicable in secondary schools, while others said that the course content were outdated and needed revision. One of the teacher trainees from Makerere University in the field of arts said: *some courses which according to my understanding are not relevant, like, for example Syntax and the methodology being used to teach it is not effective.* One other teacher trainee from Kyambogo University made this observation: *Some of the course content is very appropriate, it's fine but the other thing is that it's bulky. It is wide and by making it wide they make us not to read well. So, I would say that probably they reduce on content and they target appropriate skills that would be fine (science teacher trainee).* To the researchers, this is a very important gap identified in the teacher preparation program *at Makerere and Kyambogo Universities*

5.1.2 Equips Teachers with Specialized Skills.

As previously stated, in general, both students and lecturers agree with the view that teacher education curriculum content as a curriculum component equips teacher trainees with specialized skills a real teacher must have which is acquired when teachers get exposed to the real course content specifically designed for teachers. To this effect, it appeared that one of the most important aspects of teacher education curriculum content is the realization of specialized skills for teachers essentially directed towards teaching profession. In this regard, one of the teacher educators from Foundation and Curriculum Studies, Makerere University argued that: -

I feel that foundation courses are very relevant to them as teachers because it helps them in terms of communication, teaching and in all behavioral change expectation and to understand how teachers relate with the student. (Foundation lecturer 1)

A biology teacher educator (Science teacher educator 2) from the same institution had a similar perception:

The student teachers we train when they go to the field, they teach based on the way we taught them. So, if you have been using lecture method like in my area of biology or when teaching biology teaching methods, that will be their preference when they are at secondary school. Nonetheless, teacher training courses involves actual giving this person the skills required for effective teaching.

In a similar sentiment, teacher trainers serving at Kyambogo University viewed teacher education course content as a factor important for trainees' career. Presupposed therefore is that teacher educators' perceptions reveal that teacher education curriculum content introduces learners to foundation of education as well as helping teacher trainees to get knowledge they would put into practice; thus, it provides the practical part of the profession. For instance, one teacher educator said that,

We feel that after this course, teacher trainees can also join us and be teacher trainers. But it is good content because we designed it in such a way that it helps them, introduces them to psychology as a course and it gives them the basis for the profession (Foundations Lecturer3)

Other teacher educators at Kyambogo University added that

What we expose to them is what they are going to apply when practicing teaching. So, once they get to know these methods, then we go to what we call history room, to prepare trainees on how to use teaching and learning aids. But in most cases, the teaching-learning aids are two dimensional (it means that it has got length and width). But then, we ask them to have a three-dimensional figure (would have the length, width and height). In other words, we encourage them to prepare models (Arts teacher educator2).

On the other hand, majority of the trainees in both institutions under study further disclosed that the teacher education course content exposed to them as teachers highly supports their teaching skills. Teacher trainees according to those interviewed in this study indicated that teaching and offering of teacher education courses is

done with a purpose of equipping them with teaching skills. To confirm this, participants' perceptions that suggested that teacher education courses equip student teachers with teaching skills were "*the course gives us the tips on how to teach", "it gives a torch on what we will find in the field", "it helps us as teachers to teach appropriately", "we are taught how to think and generate information", "we are given pedagogical content knowledge to help us teach at secondary school level"*. Thus, equipping trainees with teaching skills emerged as a strong sub-theme among student teachers to explain why teacher education curriculum content is given to them the way it is at Makerere and Kyambogo Universities.

5.2 Offers teaching methodology

The second finding was that the views of both teacher educators and student teachers were in agreement that teacher education curriculum content offers teaching methodology to teacher trainees. Indeed, the majority of the participants expressed that the curricular content university education students cover is perceived well satisfactory given the fact that the course content is developed with emphasis on making their interests at the center so that education helps students become the best that they can become in life. This in one way helps in equipping teachers with teaching skill as well as offering approaches to teaching; hence, preparing teacher trainees with the techniques and skills of how to deliver content. These are further discussed below.

5.2.1 Equips Teachers with teaching Skills**.**

The findings revealed that course content offered to student teachers give them pedagogical content skills to help them teach appropriately when they go to the field. To this extent, participants' perception of the course content as taught to teacher trainees was that it supports knowledge transfer activities significantly. This perspective mainly came from lecturers (teacher educators) who argued that teachers who passed through the teacher education curriculum content when they go to the field, they teach based on the way they were taught. So, if educators have been using lecture method like in any area of their respective specialization, that will be their preference when they are at secondary school. In particular, according to the pattern of the responses, most of the participants perceive teacher education course content as a component of teacher education curriculum involving giving teachers with the actual skills required for effective teaching at secondary school level. For instance, at Makerere University, one teacher educator held that:

> *Once you're a teacher, you have to achieve certain skills right from the classroom. In this case, I perceive the course content we give teacher trainees to be equipping them with skills necessary for them to teach, for instance, skills on how to handle students, pursue classroom management which we give trainees when teaching subject teaching methods in their area of specialization. So, I look at this content to be appropriate for the teacher preparation program and teacher trainees at large (Foundations Lecturer2).*

In the same vein, two teacher trainers from Kyambogo University observed teacher education curriculum content as a way through which trainees are equipped with basics and foundations there are to use in the field. To achieve this, trainers are exposed to subject teaching method content an excellent course because it is the foundation of any subject specialization, one must have that quality so as to teach. One of them stated:

> *Ideally what we expose to students is what they are going to apply when practicing teaching. So, once they get to know these methods, then we go to what we call history room, to prepare trainees on how to use teaching and learning aids (Arts teacher educator2).*
>
> *In this course we look at preparations, importance, how you can ask learners questions and why should ask them and when they ask you, what do you do and why do you allow them to ask you. So how do you improve the interaction between your learners? Physics education methods is all about classroom situation between the teacher and the learner (Science teacher educator1)*

Additionally, students' testimony cannot be underrated because their memories of what they cover is still fresh. Based on their first school practice (SP) experience students also evaluated the relevancy of the teacher education curriculum content covered at university. At both Makerere and Kyambogo Universities trainees too gave their perspective by disclosing that the teacher education course content exposed to them highly supports

their teaching skills. One of the teacher trainees from Faculty of Science, Kyambogo University said: *Though the courses offered us are too broad but we get teaching skills. The evidence is when I went for school practice, I did not find any challenge due to the fact that here I do a lot of work and when I reach the field, I found things were moving.* One other teacher trainee from the Department of Foundation and Curriculum Studies, Makerere University made this observation: *To me as a teacher trainee before I came here, I was not confident of myself but at the moment I am. I can now stand in front of student and communicate because of the many courses I have gone through for the period I have been here at Makerere University studying education. I have learned many things here at campus*

5.2.2 Offers Approaches to teaching.

As previously mentioned, the other finding of this study was that participants perceive teacher education curriculum content as a pathway to offering approaches to teaching. This perspective mainly came from lecturers (teacher educators) whose perspectives were that knowledge and skills of teaching are attained after teachers have been exposed to teacher education curriculum content. They cited that engagement with teacher education course content is seen as a prerequisite in enhancing teaching approaches amongst student teachers under training. Hence, embedding teaching approaches to student teachers to facilitate teaching and learning activities likely to take place amongst learners in secondary schools and society according to these participants.

From the above sentiments, teacher educators were arguing that student teachers who go through teaching courses were able to get pedagogical skills a process that would culminate into teaching student teachers how to handle learners hence improving the teaching and learning process at the lower level where they are likely to serve. The other perspective of teacher educators was that teacher education curriculum content is seen beyond offering content but also training teachers how to deliver content among other requirements. One teacher educator at Makerere University pointed out

> *Education courses here at School of Education have been designed in such a way that they do not only teach the content but also, teach how to teach the content. (Arts teacher educator3)*

Other teacher educator from Kyambogo University added that

> *what we do is basically to beef them up with pedagogy and all the skills that they can use to teach about the past and to teach it better. (Arts teacher educator2)*

Similarly, the participants' responses indicated that the teacher education curriculum content meant to prepare trainees on ways of delivering to which real active teaching is experienced. Thus, demonstrating the extent to which education course content as an element of teacher preparation exposes student teachers to methods of teaching. In addition to educators' conceptions, majority of the teacher trainees interviewed in this study reported that they perceive course content taught as alleyway through which they are taught how to teach, deliver content, how to handle students and how to be successful in their journey as teachers. For instance, one teacher trainee from Department of Chemistry, Kyambogo University said,

> *The curriculum we are taught and exposed to gives us student teachers some of the techniques we use while teaching e.g., if they are saying that when the students are shouting, what can you do? or if a student asks you like a joking question which is off topic from what you are teaching, what can you do? So, in that sense they prepare me to go and face that environment by giving me ways of dealing with learners. (Science teacher educator4)*

In conclusion, the dominant perceptions showed by participants signifies that teacher education curriculum content as offered at Makerere and Kyambogo Universities shows a modification in approach on how teacher training is done. Similarly, Participants' perceptions directly indicated that teaching and offering of teacher education courses is done with a purpose of equipping student teacher with teaching skills.

6. Discussion

The study set out to study the perceptions of the teacher education curriculum content held by academic staff and student teachers in public Universities in Uganda. According to the findings from both teacher trainees and their lecturers agree that they ideally perceive teacher education curriculum as an element of teacher training that offers professionalism and teaching methodology to teacher trainees, hence, qualifying trainees to teaching, offering approaches to teaching, equipping teacher with specialized and teaching skills. Teacher educators emphasized that teacher education curriculum helps pre-service teachers to execute their duty of teaching excellently as well as giving teachers ability to meet their daily activities of teaching. This finding is basically in tandem with extant literature by curriculum and development scholars in higher education that teacher education curricular courses provide likely teachers with various opportunities to acquire useful, practical knowledge (Kim et al, 2011). The implication herewith is that the teacher education curriculum content is very important and that there is a lot of relevancy in it since its geared towards instilling professionalism and teaching methodology among teacher trainees.

In view of these results, it is interesting to note that at Makerere and Kyambogo Universities the teacher education courses taught to undergraduate student teachers were perceived by both teacher trainers and lecturers to have initially been designed for domesticated program for teachers. This was revealed when majority of the educators in various departments in the two institutions ascertained that teacher education curricular enforce core practices of the teaching profession. The results corroborated such studies such as McDonald et al. (2013) who concluded that preparing teachers to enact core practices requires a sea change in the practice of teacher education. This further strengthened the subscription that the initial teacher training comprises the time period necessary to fully prepare persons for the teaching profession, that is, from the decision to become a teacher to becoming a fully responsible member of the teaching profession (Lohse-Bossenz et al, 2013). In this way, the findings of the study further rhyme with Hollins (2011) who, while probing the philosophical stance that influences the framing of the curriculum, surmised that teacher education curriculum must be given time to be diagnosed well.

An emergent body of evidence confirms that teacher education curriculum content is appreciated to be more pertinent, appropriate and yields greater benefits to teachers and the society at large since its intended to address sustainability (McKeown, 2014). These statements clearly show that in teacher education, teacher education curriculum content is viewed to be a core and foundation for teacher trainees because of its rhyming with the secondary school curriculum and of course it gives them much more than what is embedded in the secondary school curriculum. This supports Lohse-Bossenz et al's (2013) contention that non-subject-specific courses are considered an integral part of teacher education. Such courses are mostly called educational foundations that tend to include discipline like history of education, sociology of education or educational psychology. As pointed out earlier, a quicker look at the variety of teacher education course content as observed at Makerere and Kyambogo universities is the realization of specialized skills for teachers essentially directed towards teaching profession. Indeed, these courses help teacher trainees to accumulate massive knowledge (Van Driel and Berry, 2012).

The above notwithstanding, results correspondingly revealed that several study participants across departments training teachers at Makerere and Kyambogo Universities primarily perceive teacher education curricular content as a prerequisite trainee must go through before the University sends them to the field. This point is also strongly resonant in the work of Zeinchner et al.'s (2014) on teacher training where they demonstrated a positive impact acquired as a result of engaging in teacher education content that candidates learn what and how to teach in their courses and then go out and apply what is learnt in schools during their field experience. Further, according to Van Driel and Berry (2012), the course content therefore helps student teachers in increasing an understanding of how to develop insights in specific subject of the curriculum content. The finding thus strengthens and acts as a confirmatory to earlier studies such as Olson et al, (2016) who hold that pre-service teachers described the quality of the university teaching and the structure of the curriculum to matter a lot more than the number of units to be taught, hence perceived importance.

From the foregone discussion, the study spelt out and thus observed that teachers need to understand what they are going to do in the field in terms of how to handle students and other related aspects of teaching and learning activities which were understood to might have been attained through the teacher education course content. However, as Mishra et al (2011) asserts, teacher education courses set the stage for content and skills developed during pre-service teacher training, and have the potential for being the keystone of the degree program and the foundation of a teaching career. In this way, the findings of the study further rhyme with Abell et al, (2009) who, while reinforcing and supporting various models of teacher preparations, surmised that teacher training courses should enforce numerous knowledge and skills as this was perceived to transform teachers' familiarity with the teaching profession. The implication herewith is that teacher education courses provide an overview of the profession (Mishra et al. 2011); thus, helping teachers gain membership with teaching profession (Scheja, 2015). Similarly, participants also agreed that there is indeed need for educators to have adequate content knowledge. As evidence of several trainees noted that some of their lectures were either 'knowledgeable of the subject matter' or 'had good understanding of content and subject matter' while others were not adequately perceived that way. Yet a strong link between educators' knowledge of subject matter and training of student teachers ensure that student-teachers acquire the knowledge and skills required by a prospective teacher (Hassan et al, 2015).

The findings also show that despite the positive perceptions of teacher education curricular content held by teacher educators and student, its conceptualization still remains complicated. Indeed, across the two institutions, trainees held that the teacher education course content is okay but too bulky and broad, some said that its relevant but not applicable in secondary schools, while others revealed that the content were outdated, theoretical and need revision. The views of the student teachers appear to agree with the ideas of Darling-Hammond (2006) that most of the teacher education courses gear towards theory base, failing to link to practical. Equally, Kim et al (2011) explains that many curricular contents in teacher education programs are theory-based, a factor that sometimes drive the curricula content of teacher education to a different direction. This is possibly why authors like Zeinchner et al (2014) advise that the practice should be that candidates learn what and how to teach in their courses and then go out and apply what is learnt in schools during their field experience.

7. Conclusions

In this study, we sought to establish views of teacher educators and student teachers on teacher education curriculum content. The findings have clearly shown that both lecturers and student teachers view teacher education curriculum content positively viewing it as enabling learners to be equipped with specialized teaching skills, essentially directed towards teaching profession. The findings also showed that the teacher education curriculum content at Makerere and Kyambogo Universities enables student trainees to effectively deliver content in secondary schools to meet the demands and needs of secondary school curriculum despite complaints by external stakeholders. The curriculum emphasized the skills necessary for teacher trainees to attain competence in teaching and learning environment, pedagogy as well as understanding learners required to perform their duties.

8. Recommendations

Based on the findings, this study recommends the following as far as teacher preparation is concerned. First, teacher training institutions need to continuously review teacher education curriculum in order to weed out outdated content. This should be done following NCHE guidelines that provide for periodic review of curriculum every three to five years and universities need to adhere to this. Secondly, there is need to design a 21st-century teacher education curriculum by teacher trainers in corroboration with other university units rendering a training service to teacher trainees. This would bridge the gap of the disjointed teacher education curriculum content at Makerere and Kyambogo Universities hence strengthening the building blocks that produce a teacher.

References

Asare, K, B., & Nti, S. (2014). Teacher education in Ghana: a contemporary synopsis and matters arising. SAGE Open, April April-June 2014: 1-8

Ballard, S. L., & Dymond, S. K. (2017). Addressing the general education curriculum in general education settings with students with severe disabilities. *Research and Practice for Persons with Severe Disabilities*, *42*(3), 155-170.

Bourke, T., & Lidstone, J. (2015). Mapping geographical knowledge and skills needed for pre-service teachers in teacher education. *SAGE Open*, *5*(1), 2158244015577668.

Clark, S. K., Byrnes, D., & Sudweeks, R. R. (2015). A comparative examination of student teacher and intern perceptions of teaching ability at the preservice and inservice stages. *Journal of Teacher Education*, *66*(2), 170-183.

Clark, S. K., Byrnes, D., & Sudweeks, R. R. (2015). A comparative examination of student-teacher and intern perceptions of teaching ability at the preservice and inservice stages. *Journal of Teacher Education*, *66*(2), 170-183.

Cochran, K. F., DeRuiter, J. A., & King, R. A. (1991). Pedagogical content knowing: An integrative model for teacher preparation. *Journal of teacher Education*, *44*(4), 263-272.

Creswell, J. W. (2003). Research design: Qualitative, quantitative and mixed methods approach. Thousand Oaks, CA: SAGE.

Darling-Hammond, L. (2006). Constructing 21st-century teacher education. *Journal of teacher education*, *57*(3), 300-314.

Depaepe, F., Verschaffel, L., & Kelchtermans, G. (2013). Pedagogical content knowledge: A systematic review of the way in which the concept has pervaded mathematics educational research. *Teaching and Teacher Education*, *34*, 12-25.

Depaepe, F., Verschaffel, L., & Kelchtermans, G. (2013). Pedagogical content knowledge: A systematic review of the way in which the concept has pervaded mathematics educational research. *Teaching and Teacher Education*, *34*, 12-25.

Gholami, J., & Qurbanzada, I. (2016). Key stakeholders' attitudes towards teacher education programs in TEFL: A case study of Farhangian University in Iran. *Journal of Teacher Education for Sustainability*, *18*(2), 5-20.

Giannakaki, M. S., Hobson, A. J., & Malderez, A. (2011). Student teachers' perceptions of the effectiveness of their initial preparation. *European Journal of Education*, *46*(4), 456-473.

Goodwin, A. L., Smith, L., Souto-Manning, M., Cheruvu, R., Tan, M. Y., Reed, R., & Taveras, L. (2014). What should teacher educators know and be able to do? Perspectives from practicing teacher educators. *Journal of Teacher Education*, *65*(4), 284-302.

Hassan, A., Maharoff, M., Abiddin, N. Z., & Ro'is, I. (2015). Teacher trainers' and trainee teachers' understanding towards the curriculum philosophy regarding soft skills embedment in the Malaysian Institute of Teacher Education. *Policy Futures in Education*, *14*(2), 164-175.

Herold, F., & Waring, M. (2009). Pre-service physical education teachers' perceptions of subject knowledge: Augmenting learning to teach. *European Physical Education Review*, *15*(3), 337-364.

Hollins, E. R. (2011). Teacher preparation for quality teaching. *Journal of Teacher Education*, *62*(4), 395-407.

Hsieh, F. J., Law, C. K., Shy, H. Y., Wang, T. Y., Hsieh, C. J., & Tang, S. J. (2011). Mathematics teacher education quality in TEDS-M: globalizing the views of future teachers and teacher educators. *Journal of Teacher Education*, *62*(2), 172-187.

Kagoda, A. M. (2018). Reflections of teacher trainees experience of microteaching: A case study geography teacher trainees school of education, Makerere university, Uganda, Athens: A TINER'S conference paper series, No: EDU2017-2359.

Kagoda, A. M. (2019). Improving teacher education through organizational learning and networks. In *Organisation und Netzwerke* (pp. 261-267). Springer VS, Wiesbaden

Kagoda, A. M., & Itaaga, N. (2013). A Survey of teacher trainees' expectations, experiences and assessment in Uganda. *Journal of Educational and Social Research*, *3*(5), 43.

Kagoda, A. M., & Katabaro, J. (2013). Funding Teaching Practice in two East African universities: Its influence on the behavior and practices of a supervisor. *Africa Education Review*, *10*(sup1), S117-S133.

Kagoda, A. M., & Sentongo, J. (2015). Practicing Teachers' Perceptions of Teacher Trainees: Implications for Teacher Education. *Universal Journal of Educational Research*, *3*(2), 148-153.

Kim, R, Y., Ham, S., & Pain, W. L. (2011). Knowledge expectations in mathematics teacher preparation programs in South Korea and United States: towards international dialogue. *Journal of teacher education 62(1)* 48-61

Lohse-Bossenz, H., Kunina-Habenicht, O., & Kunter, M. (2013). The role of educational psychology in teacher education: Expert opinions on what teachers should know about learning, development, and assessment. *European Journal of Psychology of Education*, *28*(4), 1543-1565.

McDonald, M., Kazemi, E., & Kavanagh, S. S. (2013). Core practices and pedagogies of teacher education a call for a common language and collective activity. *Journal of Teacher Education*, *64*(5), 378-386.

Meegan, S., Dunning, C., Belton, S., & Woods, C. (2013). Teaching practice: University supervisors' experiences and perceptions of a cooperating physical education teacher education programme. *European Physical Education Review*, 1356336X13486054.

Mishra, J., Day, K., Littles, D., & Vandewalker, E. (2011). A content analysis of introductory courses in music education at NASM-accredited colleges and universities. *Bulletin of the Council for Research in Music Education*, (190), 7-19.

Mkandawire, M. T., Maulidi, F. K., Sitima, J., & Luo, Z. (2018). Who should be deciding what to be taught in schools? Perspectives from secondary school teacher education in Malawi. *Journal of medical education and curricular development*, *5*, 2382120518767903.

Okpala, C. O., Rotich-Tanui, J., & Ardley, J. (2009). Voices of preservice teachers on teacher quality components in urban schools. *The Journal of Negro Education*, 135-145.

Okpala, C. O., Rotich-Tanui, J., & Ardley, J. (2009). Voices of preservice teachers on teacher quality components in urban schools. *The Journal of Negro Education*, 135-145.

Otaala, J., Maani, J. S., & Bakaira, G. G. (2013a). Effectiveness of university teacher education curriculum on the secondary school teacher performance in Uganda: The case of Kyambogo University. *Journal of International Cooperation in Education*, *15*(3), 95-112.

Otaala, J., Maani, J. S., & Bakaira, G. G. (2013b). The Influence of Universities on Teacher Effectiveness at the Secondary School Level in Uganda: Kyambogo University as a Case. *CICE 5 Africa-Asia University Dialogue for Educational Development: Final Report of the Phase II Research Results:(3) Teacher Professional Development*, *5*(3), 135-153

Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational researcher*, *15*(2), 4-14.

Shulman, L. S. (1987). Assessment for teaching: An initiative for the profession. *The Phi Delta Kappan*, *69*(1), 38-44.

Srinivasan, R. (2016). Teaching about teaching: Examining the pedagogy of teacher education in India. *Higher Education for the Future*, *3*(2), 197-212.

Van Driel, J. H., & Berry, A. (2012). Teaching about teaching science aims, strategies, and backgrounds of science teacher educators. *Journal of Teacher Education*, 0022487112466266.

Weber, R. (2004). Editor's comments: the rhetoric of positivism versus interpretivism: a personal view. *MIS quarterly*, iii-xii.

Zeichner, K., Payne, K. A., & Brayko, K. (2015). Democratizing teacher education. *Journal of Teacher Education*, *66*(2), 122-135.

Hassan, A., Maharoff, M., Abiddin, N. Z., & Ro'is, I. (2015). Teacher trainers' and trainee teachers' understanding towards the curriculum philosophy regarding soft skills embedment in the Malaysian Institute of Teacher Education. *Policy Futures in Education*, *14*(2), 164-175.

Olson, R., Laidlaw, P., & Steel, K. (2016). 'No one wants to be taught from a textbook!' Pre-service health and physical education teachers' reflections on skill acquisition and a new curriculum. *European Physical Education Review*, 1356336X16658222.

Scheja, M. (2015). Exploring potentialities for cosmopolitan learning in Swedish teacher education. *Policy Futures in Education*, *13*(6), 775-787.

Abell, S. K., Rogers, M. A. P., Hanuscin, D. L., Lee, M. H., & Gagnon, M. J. (2009). Preparing the next generation of science teacher educators: A model for developing PCK for teaching science teachers. *Journal of Science Teacher Education*, *20*(1), 77-93.

Mckeown, R. (2014). The leading edge of teacher education and ESD. *Journal of Education for Sustainable Development*, *8*(2), 127-131.

Government of Uganda, (1992). Government White Paper: Education Review Commission

The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 85-95
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.176

The Power of a Doodling Brain: Concept Maps as Pathways to Learning

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Abstract
Children begin to emulate writing and what they see around them at a very early age (Byington & Kim, 2017). The simple scribbles they begin to produce are representations of complex cognitive processes occurring. The constant cognitive scaffolding which medical students experience can be compared to the cognitive process children participate in when they doodle, this could be aiding them to visualize and to efficiently create concept maps as adults to learn key concepts and to quickly make connections. The ability to visualize and to understand the relationship of critically important medical concepts remains an invaluable skill which can be reflected through diagramming, concept mapping and doodling.

Keywords: Concept Mapping, Teaching/Learning, Critical Thinking

1. Introduction

Children begin to emulate writing and what they see around them at a very early age (Byington & Kim, 2017). The simple scribbles or doodles are representations of complex cognitive processes occurring. Over time, when some of those children become medical students they find themselves tapping into those early childhood experiences and reflect the learning which is taking place in their brain. Medical students develop their scribbling in order to cement concretely specific key concepts in medical school courses including: Pathology, Neuroscience, Microbiology and others. The ability to visualize the relationship among critically important medical concepts is represented through diagramming, concept mapping and doodling.

When asked about the benefits of drawing and using color to understand concepts and to make connections between topics before a test, recent Stanford graduate, Alejandra Esparza Young, who will be entering medical school in the Fall of 2021, stated the following, "In my Organic Chemistry classes, instead of writing down sentences and bulleted lists, I represented chemical reactions with drawings made up of dots, lines, and arrows." Alejandra grew up bilingual along the U.S. and Mexico border in the small town of Brownsville, Texas. She recalls that the act of drawing and coloring brought forth an element of elegance when it came to learning Chemistry at Stanford. She adds:

> In class, I genuinely enjoyed watching my organic chemistry lecturers draw out simple hexagons and sticks in blue, green, red, or black to represent much more complicated concepts. There were often almost no words or numbers to be seen on the white board, and it was pleasantly surprising and refreshing!

This description is in line with the much-needed brain break which can occur through the process of doodling (Pillay, 2016). Medical students seem to experience a sense of relief by illustrating and drawing out their ideas and the organization of those ideas simply because the learning process becomes more fun. A blank sheet of paper can quickly become geometric shapes and arrows which fit together like a mosaic, and which can fill almost any empty space on a note page with another new piece of information.

The lasting effect and benefit of creating these drawings means that during an exam some images may call for an understanding of key information which can be found in lab reports. For instance, a concept map on a complex topic like treatment of cardiac arrhythmias requires a student to start with basic fundamentals that gradually build upon mechanisms of ionic movement in cardiac action potentials and electrophysiology of cardiac myocytes, which is a complex physiological concept, until ultimately students find themselves comfortable interpreting the interrelationships that exist between antiarrhythmic drugs and the effect they cause on patients EKG or to clinically relevant abnormal lab reports seen in patients who are overdosed with these medications. The understanding of medical concepts requires deep thinking and serious synthesis of volumes of information. Alejandra confirms the need to master this critical skill by further adding that as she moved forward in her course work, she found great value in reducing complicated processes to simple drawings. She shares that feels confident this strategy will help her in medical school. The process of using concept maps, doodling and drawing made studying other subjects a more creative and engaging process. Reviewing the critical skills and tools utilized by Alejandra, we can identify that visual representations that are student-centered and student-created emerge as invaluable tools to manage large amounts of new knowledge.

2. What is a Concept Map vs. a Graphic Organizer?

Concept maps are visual representations of information and can take the form of charts, graphic organizers, tables, flowcharts, Venn Diagrams, timelines, or T-charts. They are a framework for visualizing the relationships between big, cross-functional ideas (Simmons et al., 1988). Concept maps can be a powerful study tool and strategy because they help you see the big picture. They allow the learner to start with higher-level concepts and proceed to chunk information based on meaningful connections and therefore making the details more significant and easier to remember (Robinson et al., 2006). More importantly, the use of concept maps allow students to visualize and remember concepts when it matters, during an exam and on a long-term basis , such as remembering protocol during specific situations. Yadmarie Rivera, who is originally from Puerto Rico and a second year medical student at the University of Medicine and Health Sciences in St. Kitts (UMHS-SK), finds that when she closes her eyes she can still see the image of a concept map and can remember even the location of a concept on the actual concept map and where the color can be found and what that color represents. Medical students are consistently scaffolding their learning and using prior knowledge to make further connections in a meaningful and permanent way. For Yadmarie, as a bilingual medical student, the practice of accessing prior knowledge of words remains a frequently used skill. She has found her bilingual skills to be a plus especially in medical school where so much of the vocabulary is Latin based. Yadmarie states:

> The benefits of a concept map are endless, but the most important is that you really get to extract the information that you need to really understand a topic. The concept map gives you the substance to ace your classes by providing a meaningful relationship among the concepts.

It would make sense that concept maps work very well for medical school content since these courses have visual elements as they pertain to the nervous system, skeletal structure, circulation system, and other similar concepts in which it is important to see and understand relationships between different elements. Creating boxes and connecting lines, drawing concept maps connect ideas and show their relationship to each other. In a concept map, each idea in a box is called a ***node.*** The branches that connect two nodes are called ***cross-links***. The cross-links often have words that help explain the relationships between the connection (Ermis, 2008).

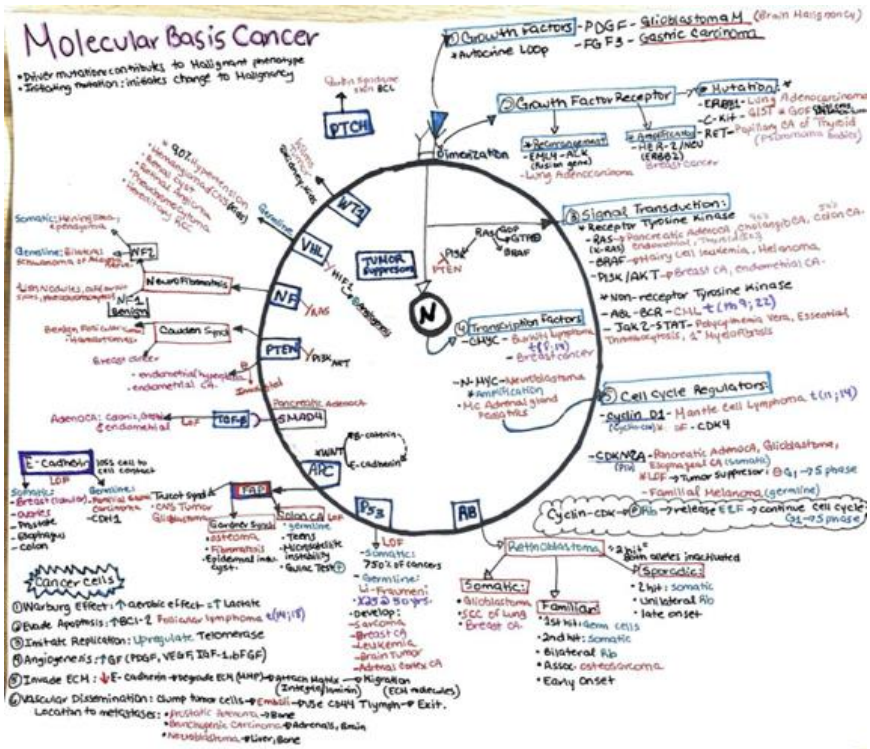

Figure 1: Yadmarie Rivera, Maine student, UMHS SK, Pathology 1 Concept Map. Reprinted with Permission.

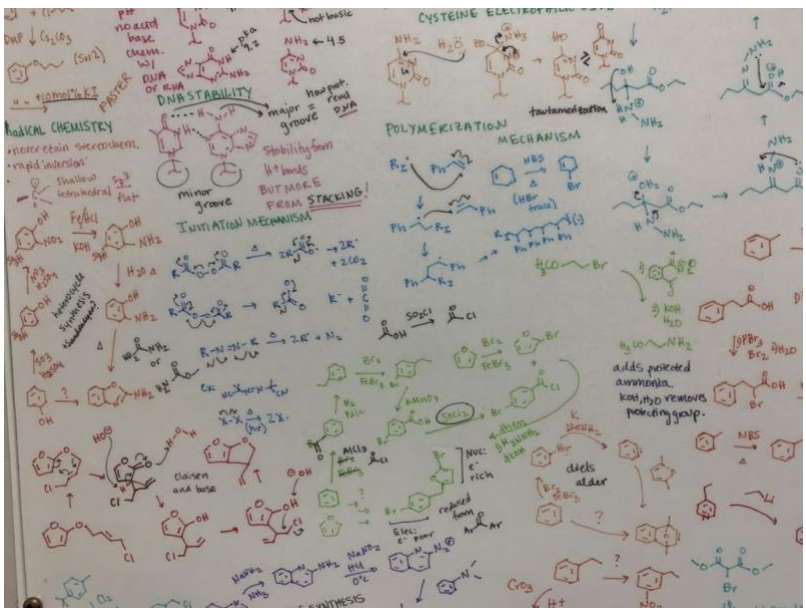

Figure 2: Alejandra Esparza Young, Stanford University, Organic Chemistry Concept Map. Reprinted with Permission.

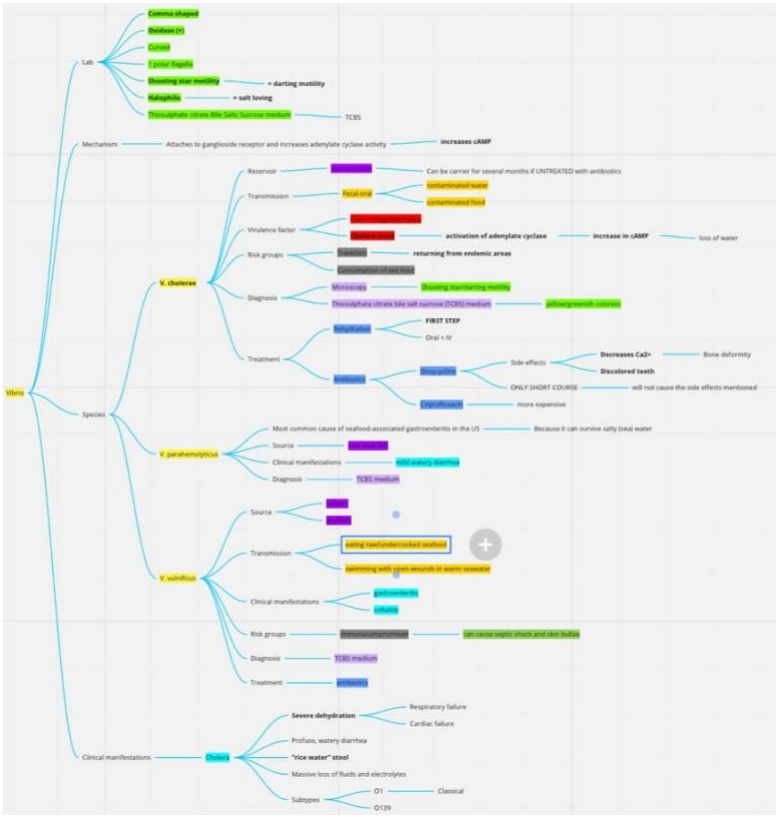

Figure 3: Milagros Rivera, EBS 5 UMHS SK, Microbiology Concept Map Using MIRO Application. Reprinted with Permission.

3. Graphic Organizers are useful in Science Learning

A graphic organizer can be defined as a "visual representation of knowledge" regarding a certain concept (Bromley et al., 1999). Graphic organizers facilitate learning in content areas by providing clear visualizations of ideas and fostering student reflection. Students can also use the open-endedness of graphic organizers to gain a more thorough understanding of concepts since they allow for information to be arranged in a way that best shows the interrelatedness of pieces of information presented (Horton et al., 1990). Additionally, the structure of graphic organizers remains more suited for comprehension as compared with traditional linear note-taking of information; graphic organizers are able to show the relationship among concepts (Ermis, 2008; Fisher, 2001; Robinson et al., 2006). Graphic organizers have been sorted into four categories according to the interrelatedness of information to be presented in a particular graphic organizer (Ermis, 2008; Struble, 2007).

CONCEPTUAL is suitable for presenting a central idea with supporting information. examples: concept maps, Venn diagrams, and KWL	**SEQUENTIAL** show events that happen in sequence examples: cause/effect, problem/solution, and storyboards
HIERARCHICAL rank information according to such qualities as importance and have sublevels to show such examples: classifying charts, branching diagrams, and topic/subtopic webs	**CYCLICAL** designed to show the natural cycle of various concepts examples: an organism life cycle chart

Figure 4: The four categories of graphic organizers include conceptual, hierarchical, cyclical, and sequential (Struble, 2007).

4. The Process of Visualization as a Means to Organization

When medical students go about the business of reading in medical school, they try to go about it in a systematic fashion. The first approach considers factors such as the amount of time a medical student has to review the number of slides in a presentation. Based on this initial assessment, a decision is made in order to determine how much time should be spent on each slide. Medical students have to maintain a pace even when taking a first glance at important content. Even after an initial review, the first step of recollection and understanding begins. Repetition is key here. After a second look, the process of visualization continues and depending on what is not recalled, further concrete actions may need to ensue. One of these behaviors includes concept mapping.

To be able to make connections between key concepts from different courses in a meaningful way, the visualization process is invaluable. Concept maps can illustrate these links and relationships during the process of learning. A visual representation of these relationships can provide opportunities to see how multiple topics are synthesized. The experience of intentionally seeking ways to interweave the content from lectures leads to moving from abstract ideas to more concrete representations of multiple topics. Medical students begin to make logical correlations between Pharmacology and Physiology, for example. The two subjects are related and creating a concept map can support picturing these relationships.

A concept map basically represents the knowledge structure of the information medical students have stored and organized in their minds about a certain course topic. Medical students find it helpful to learn new topics by grouping facts and ideas in a different and creative way (Daley et al., 2016). Visualization continues to be an effective way to foster self-directed and life-long learning by using the act of moving from visualizing to drawing which literally creates and keeps a free space to park knowledge and information in a logical manner. Even when a diagram is not complete, the diagram can still serve as a parking lot of ideas which can be revisited later and repeatedly (Alias & Tukiran, 2006).

5. Collaborative Learning and the Brain

An overview of how collaborative decision-making through visualization can be supported through node-link diagrams where nodes are either arguments or statements and links between the nodes represent inferences between those visualizing different points of view to comprehend the topic at hand (Ahn & Brusilovsky, 2009; Wang et al., 2006). Such visualization not only helps the decision-making process, but it also provokes understanding of various opinions and provides insights as to how other learners construct their learning (Sumner et al., 2005). Overall visualization is aimed at fostering awareness and reflection about learning processes or changes in them. It enables medical students to compare and contrast their understanding with peers (Braak et al., 2006).

Interaction with fellow interns, during clinical rotations, is a core aspect of how learning is organized in medical school. The organization of this learning and the critical thinking skills utilized are particularly relevant to medicine where learning is not only a matter of accepting fixed facts, but it is the dynamic, ongoing, and evolving result of complex interaction taking place. Visualization, therefore, as mentioned before, is extremely useful to make people aware of the context in which they are functioning and enables them to explore this context (Adnan et al., 2008).

Visualization can support learners in coordinating their actions. One advantage is that this can help to overcome the over-scripting problems that often occur- a collaboration script is a set of instructions that describe how students should work together, form groups, and how they should collaborate to reach a common goal such as determine a course of action for a set of symptoms. problem. Visualization helps with overcoming scripting that may interfere with the learning process by forcing students to interact.

6. Learning Effect on the Brain When We Write

One of the hardest things to learn while in medical school is to first learn how to learn in order to be a successful learner. Certainly, a concept map is an easy way to acquire the golden skill of learning medical school content. Acquiring and learning medical concepts efficiently takes time, but once this skill is learned, then this same skill can be applied to visualizing ideas in the future and for, perhaps, a larger and more comprehensive, complex concept. The process remains dynamic because concept maps bring an open space to create and organize thoughts in a fun way much like the doodling that kids do in school. Besides being more fun than just reading linear text, this intentional and organized doodling gives license and the freedom to be creative while at the same time thinking critically and in a substantive and meaningful way. In many ways, literally connecting the dots as well being able to think outside the box

Reading and writing have undergone an evolution over a long period of time. Its history begins 50,000 to 100,000 years ago when our early ancestors created drawings on cave walls. Which will pave the way for quill pens, pencils, ink pens, ball point pens, and felt tip markers, and later typewriters and computer keyboards. We see how this evolution has impacted the education landscape, and how digital devices and technology dominate the classroom, but we still see the importance of children learning to write on paper and pencil. The act of putting pencil to paper is a complex cognitive process that is essential and important for the development of thought, since the act of writing involves multiple senses in our brain and these senses are part of the learning experience. When writing by hand, our brain receives feedback from our motor actions, together with the sensation of touching a pencil and paper. This kind of feedback is significantly different from those we receive when touching and typing on a keyboard.

The very act of handwriting appears to have important cognitive benefits. For example, a study of 15 children in Indiana (James & Engelhardt, 2012) who were asked to write, trace, or type letters while having their brains scanned found that *writing* letters activated more regions of the brain than typing letters—in particular, visual processing centers at the heart of perceiving letters (Alamargot, & Morin, 2015). Note taking is an effective memory and learning aid because it prompts students to *think about* their learning; it's more effective when done by hand (Mueller & Oppenheimer, 2014; Stevenson & Just, 2014) and more words were recalled after writing on paper than typing (Mangen et al., 2015; Kiefer et al., 2015; Hatano et al., 2015). Additionally, handwriting seems to be more effective for conceptual comprehension than typing. In fact, comprehension assessment of listening to technology/entertainment/design talks was superior among college students who made notes in a notebook using a pen as compared to those who typed notes on a laptop computer (Mueller & Oppenheimer, 2014). The advantage of handwriting over typing has also been indicated in neuroscientific approaches using electroencephalography (van der Meer & van der Weel, 2017).

What may start as a doodle and can also quickly materialize into an organized concept map. The many creations include: flow charts or tables with arrows and sticky notes which can actually serve as a narrative for an entire lecture in medical school. The ability to see the disease or mechanism of action in your head and to see this during an exam is key. Visualizing these concepts in your head will be retained in memory and cognitive processes go through the processes of consolidation, active recall, and storing information as part of long-term memory.

Concept mapping comes in handy when the vast amount of information and facts begin to overwhelm the process of thinking and the concepts and ideas begin to become random and disconnected. There is great value in being able to make connections between important topics even though, as to be expected, the ability to effectively understand critical material remains challenging when a medical student is receiving information at a speed they have never experienced before. Oftentimes, medical students may be in a state of cognitive paralysis and find themselves unable to analyze at a very quick pace and on a consistent basis. Therefore, concept mapping, from the very start, remains among the most effective options to aid with the classification of critical ideas.

The ability to use and create concept maps is a skill many students develop throughout their years enrolled in medical school; this particular skill in medical school is extremely important, and for many reasons. Learning the art of concept mapping takes a fair amount of work. Upon entering medical school there is a common

misconception that memorizing everything is the key to success. The consistent delivery of new information can be overwhelming and that feeling can be furthered by the knowledge that all of that material has to be processed, understood and applied. How can a medical student organize all of these ideas efficiently and quickly?

Note-taking during lectures by using symbols, arrows and hand-written notes help to connect the dots from one concept to another. Without realizing it, these digital or hand-written notes help to develop the skill of creating concept maps. By connecting different subjects and creating a map-like structure not only helps to organize the material faster, but research suggests that there is higher retention of the material when using concept maps (D'Antoni, 2009). Retention remains vital for medical students who must keep this information in the near future for board and STEP exams and of course, for the real-world.

7. Using Drawings, Diagrams, Doodles or Concept Mapping in Clinical Rotations

Although some may think that the volume of medical information a medical student must learn decreases as they approach the end of their four years of medical school, this actually could not be farther from the truth. As medical students enter their clinical years, the quantity of information stays the same or increases, but it is the content that changes. In order to keep up with the ever-changing content, concept maps and organized studying is what ultimately keeps medical students afloat and up-to-date with the information they are expected to learn. For example, content is often taught by chunking the content by the organ system, then further broken down by specific organ, pathological conditions of that organ, diagnostic management of that disease process, and ultimately treatment of that condition. Much like students learn, while in elementary school, that the human body is organized by organ systems that can be broken all the way down to a single cell, medical students use this logic to help organize this medical content at a much higher cognitive level. Eventually, when the time comes to review all of the material medical students are responsible for - studying and reviewing all the content can be done more efficiently with the visual support that concept maps provided by assisting the student to recall the connections previously made while working on the wards.

There are multiple ways concept mapping can be used; the visual representations can be tailored to the student's learning and also be content specific allowing for the learning to be individualized. For example, highlighting or selecting a particular color to use for one student can be important in the learning process and a different color may represent classifications or prioritization of concepts. For medical students, the use of symbols, arrows or lines can represent pathways and routes of specific diseases and reflect an understanding as to how those diseases progress. This can help medical students to work on improving their organizational skills. Over time and certainly over a period of two years in the Basic Sciences, medical students can gain tremendous proficiency when working with concept maps, since they tend to yield desirable outcomes, such as better retention of information and good exam results (Alias & Tukiran, 2006).

In addition, concept maps help support active learning through the many decisions that need to be made in order to be able to construct the diagram or map. This process also requires the use of multiple higher order thinking skills such as analyzing, interpreting, summarizing and evaluating (Ausubel, 2000). The practice of decision making keeps the brain actively engaged with what is being read and processed cognitively instead of just having the behavioral experience of transcribing content**.**

This way of learning includes a higher level of thinking; it is not just memorizing facts. The byproduct of this creative process can be the ability to produce a highly organized review for an exam or a highly detailed and effective outline to study. The diagrams or concept maps make the connections and relationships between concepts more visible in a concrete manner. Research suggests this method leads to better retention of material and to retaining information in a way which fosters long-term memories (Eppler, 2006). Without a doubt, long-term memory is essential in medical school.

8. Using Color

Although on the surface, doodles, drawings, arrows, notes, bubbles, circles and other geometric figures may seem simple and whimsical, the truth is that these illustrations demonstrate, in a concrete manner, the learning process as it is occurring. The use of colors can represent levels of knowledge and hierarchy of prioritization of concepts.

The process of classifying and categorizing appears to be simple; however, it is actually complex. A medical student might ask how putting in so much effort would help a medical student to actually do well in medical school given that time is the commodity in demand. Well, that is precisely the key is to using time more wisely and concept mapping is one way to do so, According to Milagros Rivera, a bilingual medical student from Puerto Rico, who is now in her second year at UMHS SK. She excitedly shares, "I started trying out this method of learning by doing handwritten diagrams. The moment I sat down and began, I found myself with the following questions: Where does this topic belong? Is this important? How could I further divide the concept? What should be grouped together?"

It may take multiple attempts at drawing in order to understand how to connect concepts. Milagros adds further, "I even found myself finding relationships that were perhaps not mentioned during class time. Creating these diagrams also helped me to prioritize between topics." The value of creating pictorial illustrations of important divisions is that although one topic may appear in multiple sections, the relationship of that topic to other topics may differ. For example, when a medical student is learning about treatment of congestive heart failure, a clear understanding of compensatory pathophysiological responses in a failing heart is very important. This idea could correlate to the clinical signs and symptoms of heart failure. Basically, having to decide on the order of what should appear earlier on in the concept map, calls for making sense of key concepts and the logic of it all. Even though the process can be harrowing, it can also be fun and appear to be whimsical even.

For an exhausted medical student, doodling can actually provide the brain with a much-needed break, aid with recalling details and with paying attention. Additionally, specifically with medical students, "a simple 30-minute doodle helps them remember information, fills in gaps in their thinking, and provides a much-needed reprieve from the loads of information they must wade through (Pillay, 2016). Using color can readily complement the use of concept maps because the use of color can help classification of topics and ideas easily.

The need to look for ways to group topics and compare them promotes the practice of analyzing more deeply in order to be able to answer a medical school question. This graphical tool also can be complemented with color coding which makes it easier to classify things. Color coding facilitates thinking when separating thoughts or big ideas. For example, the use of the color red versus the use of the color green could indicate similarities or differences between key ideas. The use of the color blue could indicate or represent a related disease which is associated with these specific topics.

The logical question after creating a diagram is to consider the most effective way to use them. How can the diagrams be used to review in order to prepare for an exam? In Microbiology, for instance, a medical student can create quite a large concept map on the topic of bacteria. Color-coding, which consists of marking things with different colors as a method of identification, helped to classify some of the following subtopics: Treatments, Clinical Manifestations, Method of Action, Complications, etc. Being able to go over whatever a student feels deserves the most attention in the moment, allows a student to reinforce those areas that a student may still not be comfortable with while at the same time not losing time reviewing topics which have already been mastered or understood. Furthermore, color coding facilitates the comparing and contrasting of high volumes of material. The use of color and the concept maps allows for the making of further connections between Microbiology and Epidemiology.

Through the use of concept mapping and color-coding, a student can decide what to focus on, without forgetting about the bigger picture. A student can effortlessly zoom in and zoom out of the network of information and concepts which have been created. One application can be used to create concept maps is *Miro*. *Miro* is an online platform that already offers different templates for to be used and to edit as the user prefers. Tables, posters,

diagrams and so much more can be created. When using *Miro* to create diagrams, the user selects the *Mind Map Template* and then names the Parent Concept which is the "trunk of the tree". From that big subject (or trunk) branches are developed by clicking the main subject and then clicking the *+ sign* that appears right after that. This process is repeated over and over again until the user is satisfied with the structure of the diagram. Finally, everything can be classified by changing the colors of the branches, highlighting and bolding.

Technology has become invaluable to the art of studying in medical school. It is an art because of the intricate detail required to draw images, create diagrams, color-code pertinent information, and other components. Technology has developed so much in recent years, that it has nearly replaced the need for paper notes and review materials. Specifically, one area of note-taking that technology supersedes paper notes is being able to convert PowerPoint lectures to pdf documents where students can insert their own hand-written notes over them. This allows students to also visualize real pathological and histological images without ever taking their focus away from the one-stop notes document. However, like anything else, there are some downfalls of solely technologically generated notes. For example, it eliminates at least one round of repeated review required to retain material. Prior to iPads and tablets, students had to copy down lecture notes by hand-writing all of the material from class or from lecture slides. This provided yet another read over the lecture material in addition to hearing it once in class. When the lecture slides are already on a student's tablet, they are no longer forced to write down the information as they are hearing it from the lecturer. Technology certainly has its place in medical learning, but the degree to which it is incorporated is likely dependent on each individual student and how they learn and retain information best.

9. Conclusion

Learning can be defined as the cognitive change that results from experience (Hay, 2007). To learn meaningfully and purposefully, students must choose to relate new concepts to concepts they already know (Merriam & Bierema, 2013). In medical education, concept mapping is worth researching and understanding how to make this useful technique work for the benefit of students as they process large quantities of information/knowledge and be able to relate the concept to the application of therapeutics with other disciplines like pathophysiology, microbiology, histopathology etc. When students join concepts they have learned in various disciplines with correct and valid cross-links, long term learning and memory is enhanced.

References

Adnan, W., Daud, N., & Noor, N. (2008). Expressive Information Visualization Taxonomy for Decision Support Environment. *Proceedings of Third International Conference on Convergence and Hybrid Information Technology,* 88-93. doi: 10.1109/ICCIT.2008.330.

Ahn, J.-W., & Brusilovsky, P. (2009). Adaptive visualization of search results: Bringing user models to visual analytics. *Information Visualization*, *8*(3), 167-179. https://doi.org/10.1057/ivs.2009.12.

Alamargot, D., & Morin, M. F. (2015). Does handwriting on a tablet screen affect students' graphomotor execution? A comparison between Grades Two and Nine. *Human movement science, 44,* 32–41. https://doi.org/10.1016/j.humov.2015.08.011

Alias, M., & Tukiran, A. (2006). The effect of teacher generated concept maps on learning of secondary school physics. In A. J. Ca-as & J. D. Novak (Eds.) *Concept Maps: Theory, Methodology, Technology: Proceedings of the Second International Conference on Concept Mapping*, (Vol. 1, pp. 550-557). San José, Costa Rica.

Ausubel, D. P. (2000). *The acquisition and retention of knowledge: A cognitive view*. Springer. https://doi.org/10.1007/978-94-015-9454-7

Berninger, V. W., & Winn, W. D. (2006). Implications of Advancements in Brain Research and Technology for Writing Development, Writing Instruction, and Educational Evolution. In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (pp. 96–114). The Guilford Press.

Bohn, K. (2018, October 3). *Latin may help students bridge their native language with English.* Penn State News. https://news.psu.edu/story/538034/2018/10/03/research/latin-may-help-students-bridge-their-native-language-english

Braak, S.W. van den, Oostendorp, H. van, Prakken, H. & Vreeswijk, G.A.W. (2006). A critical review of argument visualization tools: Do users become better reasoners? In F. Grasso, R. Kibble & C. Reed (Eds.), *Workshop Notes of the ECAI-06 Workshop on Computational Models of Natural Argument,* 67-75.

Bromley, K., Irwin-DeVitis, L. & Modlo, M. (1999). *50 graphic organizers for reading, writing & more*: *Reproducible templates, student samples, and easy strategies to support every learner***.** New York, NY: Scholastic Professional Books.

Byington, T & Kim, Y. (2017). Promoting Preschoolers' Emergent Writing. *Young Children*. 72(5) Retrieved January 26, 2021, from https://www.naeyc.org/resources/pubs/yc/nov2017/emergent-writing

D'Antoni, A. V., (2009), *Relationship Between the Mind Map Learning Strategy and Critical Thinking in Medical Students.* (Publication No. 1372) [Doctoral Dissertation, Seton Hall University]. Seton Hall University Dissertations and Theses (ETDs).

Daley, B. J., Durning, S. J., & Torre, D. M. (2016). Using Concept Maps to Create Meaningful Learning in Medical Education. *MedEdPublish, 5*(1), 19. https://doi.org/10.15694/mep.2016.000019.

Eppler, M. (2006). A comparison between concept maps, mind maps, conceptual diagrams and visual metaphors as complementary tools for knowledge construction and sharing. *Information Visualization*, *5*(3), 202-210. http://dx.doi.org/10.1057/palgrave.ivs.9500131

Ermis, S. (2008). *Using graphic organizers to facilitate elementary students' comprehension of informational text.* In M. Foote, F. Falk-Ross, S. Szabo, & M. B. Sampson (Eds.), *College Reading Association yearbook: Vol. 29. Navigating the literacy waters: Research, praxis, and advocacy*, 87–102. College Reading Association.

Fisher, A. (2001). Implementing Graphic Organizer Notebooks: The Art and Science of Teaching Content. *The Reading Teacher*, *55*(2), 116-120.

Goldhammer, R. & Munitello, M. (2020, November 12). *Retrieval-Based Concept Mapping and the Master Adaptive Learner in Medical Education* [Workshop]. Medical Education Learning Specialists. https://melsgroup.org/mels-virtual-meeting-2020/

Hatano, A., Sekine, T., Herai, T., Ihara, N., Tanaka, Y., Murakami, S., & Kinugawa, S. (2015). Effects of the use of paper notebooks and tablet devices on cognitive load in learning-An Electroencephalographic (EEG) study. *IEICE Technic. Rep. 115*(185), 39–44.

Horton, S., Lovitt, T., & Bergerud, D. (1990). The effectiveness of graphic organizers for three classifications of secondary students in content area classes. *Journal of Learning Disabilities*, 12-29.

James, K. H., & Engelhardt, L. (2012). The effects of handwriting experience on functional brain development in pre-literate children. *Trends in Neuroscience and Education*, *1*(1), 32–42.

James, K. H., & Gauthier, I. (2006). Letter processing automatically recruits a sensory-motor brain network. *Neuropsychologia, 44*(14), 2937–2949. https://doi.org/10.1016/j.neuropsychologia.2006.06.026

Kiefer, M., Schuler, S., Mayer, C., Trumpp, N. M., Hille, K., & Sachse, S. (2015). Handwriting or Typewriting? The Influence of Pen- or Keyboard-Based Writing Training on Reading and Writing Performance in Preschool Children. *Advances in cognitive psychology*, *11*(4), 136–146. https://doi.org/10.5709/acp-0178-7

Kuhl, P. (2010, October). The linguistic genius of babies [Video]. TED Conferences. https://www.ted.com/talks/patricia_kuhl_the_linguistic_genius_of_babies?language=en

Longcamp, M., Boucard, C., Gilhodes, J. C., Anton, J. L., Roth, M., Nazarian, B., & Velay, J. L. (2008). Learning through hand- or typewriting influences visual recognition of new graphic shapes: behavioral and functional imaging evidence. *Journal of cognitive neuroscience, 20*(5), 802–815. https://doi.org/10.1162/jocn.2008.20504

Mangen, A., Anda, L. G., Oxborough, G. H., & Brønnick, K. (2015). Handwriting versus keyboard writing: effect on word recall. *Journal of Writing Research, 7*(2), 227–247. doi: 10.17239/jowr-2015.07.02.1

Mueller, P. A., & Oppenheimer, D. M. (2014). The pen is mightier than the keyboard: Advantages of longhand over laptop note taking. *Psychological Science*, *25*(6)*,* 1159–1168.

Ong, J. C., Arand, D., Schmitz, M., Baron, K., Blackburn, R., Grandner, M. A., Lichstein, K. L., Nowakowski, S., Teixeira, C., Boling, K., C. Dawson, S., & Hansen, K. (2018). A Concept Map of Behavioral Sleep Medicine: Defining the Scope of the Field and Strategic Priorities. *Behavioral Sleep Medicine*, *16*(6), 523–526. https://doi.org/10.1080/15402002.2018.1507672

Pillay, S. (2016, December 15). *The "thinking" benefits of doodling*. Harvard Health Blog. https://www.health.harvard.edu/blog/the-thinking-benefits-of-doodling-2016121510844

Potgieser A. R. E., Van der Hoorn A., & De Jong B. M. (2015). Cerebral activations related to writing and drawing with each hand. *PLoS ONE*. https://doi.org/10.1371/journal.pone.0126723

Quillin, K., & Thomas, S. (2015). Drawing-to-learn: a framework for using drawings to promote model-based reasoning in biology. *CBE life sciences education, 14*(1), es2. https://doi.org/10.1187/cbe.14-08-0128

Robinson, D., Beth, A., Odom, S., Hsieh, Y.-P., Vanderveen, A., & Katayama, A. (2006). Increasing text comprehension and graphic note taking using a partial graphic organizer. *The Journal of Educational Research*, 103-111.

Shellenbarger, S. (2014, July 29). *The Power of the Doodle: Improve Your Focus and Memory*. The Wall Street Journal. https://www.wsj.com/articles/the-power-of-the-doodle-improve-your-focus-and-memory-1406675744#:~:text=Recent%20research%20in%20neuroscience%2C%20psychology,on%20creative%20thoughts%20and%20ideas.

Simmons, D., Griffin, C., & Kameenui, E. (1988). Effects of teacher-constructed pre- and post- graphic organizer instruction on sixth-grade science students' comprehension and recall. *Journal of Educational Research*, *82*(1), 15-21. https://doi.org/10.1080/00220671.1988.10885859

Stahl, L. (2020, September 6). *Scientists are using MRI scans to reveal the physical makeup of our thoughts and feelings*. CBS News. https://www.cbsnews.com/news/functional-magnetic-resonance-imaging-computer-analysis-read-thoughts-60-minutes-2020-09-06/

Stevenson, N. C., & Just, C. (2014). In early education, why teach handwriting before keyboarding? *Early Childhood Education Journal*, *42*(1), 49–56.

Strijkers, K. (2016). A neural-assembly based view on word production: the bilingual test case. *Language Learning*, *66*(2), 92-131. https://doi.org/10.1111/lang.12191

Struble, J. (2007). Using graphic organizers as formative assessment. *Science Scope*, *30*(5) 69-71.

Sumner, T., Ahmad, F., Bhushan, S., Gu, Q., Molina, F., Willard, S., Wright, M., Davis, D., & Janée, G. (2005). Linking learning goals and educational resources through interactive concept map visualizations. *International Journal on Digital Libraries*, *5*(1), 18-24.

Torre, D., Daley, B. J., Picho, K., & Durning, S. J. (2017). Group concept mapping: An approach to explore group knowledge organization and collaborative learning in senior medical students. *Medical Teacher, 39*(10), 1051–1056. https://doi.org/10.1080/0142159X.2017.1342030

Understanding the Acquisition of English as an Additional Language. (n.d.). LearnAlberta.ca. Retrieved January 26, 2021, from https://www.learnalberta.ca/content/eslapb/understanding_the_acquisition_developing.html

University of North Carolina at Chapel Hill. (n.d.). *The Learning Center*. https://learningcenter.unc.edu/tips-and-tools/using-concept-maps/

van der Meer, A. L. H., and van der Weel, F. R. (2017). Only three fingers write, but the whole brain works: a high-density EEG study showing advantages of drawing over typing for learning. *Frontiers in psychology. 8,* 706. https://doi.org/10.3389/fpsyg.2017.00706

Wang, Y., Teoh, S. T., & Ma, K.-L. (2006). Evaluating the Effectiveness of Tree Visualization Systems for Knowledge Discovery. *Proceedings of Eurographics Visualization Symposium,* 67-74.

ASIAN INSTITUTE OF RESEARCH
Connecting Scholars Worldwide

The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 96-112
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.177

The Effect of Lexical Inference Strategy Instruction on Saudi EFL learners' Reading Comprehension

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Abstract
Lexical inference strategy plays an important role in increasing the level of reading comprehension of second or foreign language learners. Lexical inferencing as an efficient strategy to deal with unfamiliar words has attracted much attention in the comprehension literature. However, few studies on lexical inferencing have been conducted in an English as a foreign language (EFL) setting. To fill in the existing gap, the current study aimed at investigating the effect of lexical inferencing strategy instruction on Saudi EFL students' reading comprehension. Additionally, it sought to identify the lexical inferencing strategies used by Saudi EFL learners while they were inferring unknown words in a text. Last, the current study attempted to find the relationship between lexical inference strategies and reading comprehension among Saudi EFL learners. Sixty students from the English department were selected based on their scores on the Oxford Placement Test, indicating that they were at intermediate levels of English proficiency. The participants were randomly divided into two groups: control and experimental (each consisting of 30 students). The participants in the control group received regular instruction, while the participants in the experimental group were treated using lexical inference strategies. The instruments used for collecting data were Oxford Placement Test, reading comprehension test, and think-aloud protocol. A pre-test and post-test were administered for control and experimental groups. The results of the independent samples t-test revealed that teaching inference skills had a significant effect on reading comprehension performance among EFL learners. The results of the paired t-tests showed that lexical inferencing instruction had a statistically significant effect on EFL learners' reading comprehension development. The results of the Spearman correlation coefficient indicated that there was a significant relationship between lexical inferencing strategies and reading comprehension. The findings revealed the profound impact of lexical inferencing strategy instruction on the experimental group's performance in understanding reading text. Hence, it was concluded that lexical inferencing strategies were recommended to teach to improve the students' reading comprehension performance.

Keywords: Reading Comprehension, Lexical Inferencing Strategy, Verbal report

Introduction

The importance of reading English for EFL learners cannot be overemphasized. It receives the special focus in second or foreign language teaching and learning. It is widely recognized that reading is one of the most important skills for ESL/ EFL learners to master. As Alsheikh (2011) stated, the mastery of reading skill could help ESL/ EFL learners achieve success in English learning. Reading has played a crucial role in overall development in

language skills and even in academic success for decades (Al Fraidan, 2011). In school, reading ability is viewed as critical to academic success because students read to learn and acquire new information (Jamil, Aziz, & Razak 2010). Therefore, according to Radojevic (2006), "reading is essential for successfully completing all college-level courses. In other words, college students who are more proficient readers are most likely to experience more success in their courses". Reading is required in many of our daily occupational and recreational activities and is a prerequisite for success in our educational system (Kashkouli, &Barati, 2013; Amer and Ghabelju, 2013).

Although reading is the most demanding skill in learning English, many students face many difficulties in comprehending a reading text. They encounter many unknown vocabularies, and they often fail to generate suitable meanings. This causes comprehension problems to second and foreign language students. Similarly, Julianna (2017) points out that EFL learners are also faced with unfamiliar lexical items which can jeopardize the reading process and/or make it seem an insurmountable obstacle. To overcome such an obstacle, EFL learners normally turn to different kinds of strategies to compensate for the incomprehensible input in general and lack of vocabulary knowledge in particular (Kaivanpanah and Moghaddam, 2012). Coming across unknown words, Kaivanpanah and Moghaddam (2012) note, EFL learners either ignore the unknown words or seriously search for a strategy to compensate for their lack of knowledge. One of the most commonly used strategies has been guessing the meaning of the unknown words or, simply, lexical inferencing (Buslon, & Alieto, 2019; Nassaji and Hu, 2014; Paribakht, 2005; Qian, 2004). Lexical inferencing strategy, as Haastrup (1991: 40) defines it, 'involves making informed guesses as to the meaning of the unknown word in the light of all available linguistic cues in combination with the learner's general knowledge of the world, her awareness of the co-text and her relevant linguistic knowledge'. It is considered as an important strategy since it provides a deeper information processing of the text and also it can contribute to a better comprehension of the text as a whole (Wang, 2011). Research has demonstrated that L2 learners make wide use of lexical inferencing strategies when they deal with unknown words in their reading tasks (Nassaji 2004).

Due to the vital role of the lexical inferencing strategies in helping LS and EFL learners in making acceptable guessing from texts and utilizing lexical inferencing strategies that help them understand materials written in English in their majors, many researches in recent years have investigated the topic of the effect of the lexical inferencing strategy instruction on EFL readers (Bengeleil & Paribakht, 2004; Nakagawa, 2006; Tavakoli & Hayati, 2011; Kaivanpanah & Moghaddam, 2012; Hu & Nassaji, 2014; Safa & Kokabi, 2017; Muikku-Werner, 2017, Buslon & Alieto, 2019). Such researches indicate the positive effect of the lexical inference strategies on reading comprehension and problems in inferring the meanings of vocabulary from context. Wang (2011) further conducted a contrastive analysis between Filipino Graduate Students and Chinese Graduate Students and examined lexical inferencing strategies for dealing with unknown words. The results showed that Chinese and Filipino graduate students employed lexical inferencing strategies to deal with unknown words in reading.

Recently, Hu and Nassaji (2014) conducted a TAP with 11 Chinese ESL learners to explore L2 learners' inferential strategies and the relationship with their success. Based on both qualitative and quantitative analysis, they concluded that there were a number of differences between successful and less successful inferencers. These differences were related to not only the degree to which the participants used certain strategies but also when and how to use them successfully.

According to Anvari and Farvardin (2016), lexical inferencing strategies are among the most conducive strategies to ESL/EFL readers when they encounter an unknown word in a text. Furthermore, developing the guessing strategies can help students to overcome some of the problems arising from their lack of vocabulary knowledge (Wang, 2011). Inferential strategies are often emphasized in academic reading classes for EFL learners since they all the time encounter with the unknown words in their extensive readings and sometimes it is impractical to check the dictionary for every unknown word. Moreover, relying on dictionary may limit learners to the sentence level and prevent their global text comprehension.

However, learners' lexical inferencing is not always successful. Kaivanpanah and Alavi (2008: 92) found that 'the ability of learners to guess the meaning of unknown words is of limited value'. Learners may make mistakes in their lexical inferences (Cai and Lee, 2010). The situation is bound to deteriorate when the teachers are unaware

of unsuccessful inferences. It seems that EFL readers are prone to inexact and irrelevant guesses, hence misunderstanding the whole text. Muikku-Werner (2017) highlights the negative effect of unwarranted lexical inferences cautioning that wrong inferred meanings might be fossilized. Therefore, neither with all contexts nor with all learners should we encourage lexical inferencing (Wang, 2011). In the same line of argument, Safa & Kokabi, (2017) maintain that a threshold level of vocabulary and general language mastery is essential for successful use of lexical inferencing.

Inferencing is an adequate strategy for learners to arrive at a successful inference in L2 and EFL (Alieto and Buslon, 2019). As a result, the way learners deal with unknown words during reading has become the focus of many empirical studies in recent years. However, as stated by Cai and Lee (2010): "While much research has been done on unfamiliar word processing in reading comprehension in LS settings, empirical studies specifically investigating this issue in reading comprehension are still limited in EFL settings. Not much is known about how EFL learners process unfamiliar words in reading comprehension" (p. 126). Furthermore, Saudi EFL learners need to know how to utilize the lexical inferencing strategy for making successful inferences from the texts. Therefore, it is needed to conduct more research in this area to address such gap. Hence, the present study addressed such gap and sought to investigate the effect of the lexical inferencing strategy instruction on the Saudi EFL learners' reading comprehension. Meanwhile, as a second purpose, the study seeks to delve into the types of the lexical inferencing strategies used by Saudi EFL learners.

Statement of the problem

While lexical acquisition is an essential prerequisite to communication, it is often regarded as an 'agony' for L2 learners (Muikku-Werner, 2017). Saudi EFL learners are no exception of such an agony that can be partially relieved by lexical inferencing. Deriving word meaning, with the help of clues/ hints, makes inferencing seem a pragmatic solution to many difficulties faced by EFL learners. Nevertheless, deciding on the more acceptable inferred meanings opens the door for mistakes and it makes inferencing risky, and this brings up to the surface the issue of what types of lexical inferencing strategies (such as guessing, analyzing and monitoring strategies) are necessary for making correct inferences and how these strategies are utilized.

Training students to use the lexical inferencing strategies in order to derive the meaning of unknown words can be an ideal way of helping students to develop the students' reading comprehension performance. Many previous researches in LS and EFL settings indicate positive outcomes for many students who experienced difficulties in understanding the texts that were taught to use reading comprehension strategies (Wang, 2013; Hagaman, Casey, & Reid 2016; Ilhan Ilter, 2018; Alieto and Buslon, 2019). The results of such previous studies showed that the use of the lexical inferencing strategies had significantly affected the students' reading comprehension performance. Hence, it was concluded that lexical inferencing strategies were recommended to teach to improve the students' reading comprehension performance.

Due to the lack of studies that attest the effectiveness of lexical inferencing strategies for Saudi EFL learners' reading comprehension development, the present study sought to investigate the effect of the lexical inferencing strategy instruction on the Saudi EFL learners' reading comprehension. In addition to this, the current study seeks to delve into the types of the lexical inferencing strategies used by Saudi EFL learners. Finally, the present study attempts to examine the relationship between the respondents' lexical inferencing strategy use and their reading comprehension performance in English.

Research Questions

This study aims at investigating the lexical inferencing strategies that Saudi EFL learners employ as they read to infer the meaning of unfamiliar words. In compliance with this aim, this study addresses the following research questions:

1. Does lexical inference strategy instruction have any statistically significant effect on Saudi EFL learners' reading comprehension?

2. What types of lexical inferencing strategies do the Saudi EFL students at intermediate levels use when they attempt to guess the meaning of unknown words they encounter while reading?
3. Is there a significant relationship between the respondents' lexical inferencing strategy use and their reading comprehension performance in English?

Hypotheses of the Study

Based on the research questions and the nature of the study, the hypotheses are:
1. There is no significant difference between means of scores obtained by the experimental group (who have lexical inferencing strategy instruction) and the control group (who have regular instruction) in terms of their overall reading comprehension in the pre-test.
2. There is no significant difference between the pre- and post-test mean scores of overall reading comprehension for the control group.
3. There is significant difference between the pre- and post-test mean scores of overall reading comprehension for the experimental group and this difference is in favor of the post-test.
4. There is significant difference between means of scores obtained by the experimental and the control group in terms of their overall reading comprehension in the post-test and this difference is in favor of the experimental group.
5. There is no correlation between students' reading comprehension and their use of lexical inferencing strategy.

Research Methodology

Participants

Sixty participants took part in the present study. They were English majors at the English Department in Qassim University in the academic year 2019-2020. Students' age in both groups ranged from nineteen to twenty-one. They were enrolled in the "reading and vocabulary" class and met once a week.

Before the commencement of the experiment, ninety students were asked to take an Oxford Placement Test which is designed to determine the homogeneity of the groups to place them into appropriate classes. According to the results obtained by the students in the Oxford Placement Test administered before the start of the experiment, sixty participants were selected out of ninety English majors based on their scores on the proficiency test. They were then randomly divided into two equal groups; the experimental group (30 students) was taught through the use of lexical inferencing strategies whereas the control group (30 students) was taught through the traditional lecture method. The students thus constituted two homogenous groups in terms of their English proficiency.

Instruments of the study

Tools of the study

The present study was based upon a triangulated data collection approach using Oxford Placement Test, multiple-choice reading comprehension test, two passages and think –aloud protocol. To increase the validity of the results obtained, the method utilized for data collection in this research was based on triangulation.

Oxford placement test

In order to manifest the participants' homogeneity in terms of language proficiency level, a version of Oxford Placement Test (Edwards, 2007) was used in this study. Oxford Placement Test was valid and reliable. It was used to follow the placement procedure. The test and its criteria for placement were used to appropriately place learners in relevant proficiency levels. Oxford placement test has been used after consultation with teachers, and it was administered to assess students' knowledge of grammar, vocabulary and reading. It also enabled the researcher to have a greater understanding of what level his participants were at. The test contained 50 multiple choice questions assessing students' knowledge of key grammar and vocabulary from elementary to intermediate levels, and a

reading text with 10 graded comprehension questions (five true-false and five multiple choice items). The test was administered to ninety participants, and, based on the scored results, those whose scores were considered as extreme scores were removed from the study. Data analysis showed that 60 participants (66.7%) were in the same level and 25 (27.8%) students were in another level. So, in order to homogenize the participants, thirty participants were discarded. Then, the sixty participants were randomly assigned to the experimental and the control group. (30 students in the control group and 30 in the experimental group)

Reading comprehension test

The second instrument in the present study was a reading comprehension test which was devised by the researcher. This test intends to investigate the lexical inferencing strategies employed by students when they take multiple-choice reading comprehension test based on students' think-aloud protocols. The final version of the test contained two reading comprehension passages administered as the post-test. Each passage consisted of 10 multiple choice questions followed by 15-multiple choice vocabulary items. The first passage consists of 521 words, and the second consists of 336 words. Four options a, b, c, or d were available for every item. The selected passages were reviewed by two experts in the field to confirm that the passages to be used for the think-aloud purpose were suitable with the content and level of difficulty close to the general passages that most students in their fields had to read. Thus, they were served as representative passages in the field that the participant studied.

Validity of the test

The Validity of the test was achieved by six-member jury who evaluated the multiple-choice items of the reading comprehension test as for:
-Clarity of the items
-Whether the items reflect the content of the point tested
- Fitness of the test to the study group.

Reliability of the test

In order to determine the reliability of the reading comprehension pre and post-test and English passage comprehension results, Cronbach's Alpha test was conducted for the total number of test items. The obtained Cronbach α=.732, significant at p-value<0.05, demonstrated the relative consistency of the participants' performance on total reading comprehension test items.

Table 1: Cronbach's Alpha Indices for the Instruments of the Study

Instrument	Cronbach's Alpha	Number of Items
Reading comprehension	73	20
Reading comprehension	82	20
English passage comprehension	79	20

Since the Cronbach's Alpha indices are all above .70, it can be interpreted that all measures of the study met a satisfactory level of reliability (Brown, 2007).

Think-aloud protocols

Think aloud protocol was the third methodological tool deployed in the present study. It was used to discover the lexical inferencing strategies that EFL learners used. Think aloud protocol was one of the most widely used tools in lexical inferencing strategy research by many researchers in a second or foreign language (Smith, Kim, Vorobel, and King, 2019; Nassaji, 2006; Cohen & Upton, 2007). The main purpose for using the technique of Think-aloud protocols is to get a clearer picture of what EFL learners are doing and thinking while reading an English text, specifying the knowledge sources they used to guess the meaning of unknown words. In this procedure, learners

were asked to read the text and guess the meaning of the words they did not know and reveal how they arrived at that meaning through think aloud. Each participant will report his strategies immediately after each item.

Respondent training on how to think aloud

Before taking the reading comprehension test, all the participants received a training lesson on what is think-aloud and how to do it before collecting the data. First, they were debriefed about the TAPs. The written instructions were adopted from Seng (2007). Then, they were asked to listen carefully to the teacher conducting a think-aloud activity when reading a passage and trying to infer the meanings of some unknown words. A passage from "Interaction Level 2 Reading" (2013) was selected and then the teacher verbalized his thoughts while inferring the unknown words. Furthermore, participants' questions regarding TAPs were answered. Next, the participants were given a short passage chosen from "Interaction Level 2 Reading" (2013). The passage length was about 300 words and eight words were selected as unknown words and written in bold font. The participants were asked to read the text and attempt to infer the meaning of target words. In addition, they were asked to verbalize what they were thinking about the passage while trying to infer the meanings of unknown words. Before doing the task, they were asked to be completely relaxed and think that they were in their bedrooms in order to eliminate the effect of stress. Their voice was recorded and then transcribed to see whether they were comfortable with think-aloud or not. The audio-recordings were also analyzed to check the number and quality of strategies used by the participants. By analyzing the audio recordings of the think-aloud activity, it was found that the participants learned to verbalize their thoughts. Afterwards, two passages were given to them and 20 unknown words were highlighted as the target words. While reading the passages, students were asked to verbalize their thoughts when they were inferring the meanings of those words and their voices were recorded. The participants were allowed to use the language they felt most comfortable with, either English or Arabic, while they were thinking aloud. The participants were required to answer the questions in 60 minutes. After data collection, the think-aloud protocols were transcribed and translated into English.

How to collect the data from the verbal report

After doing the treatment, each participant was given a reading comprehension test. The test consists of two reading passages. Each target text includes ten target words bold in it. They were asked to read the text for comprehension and to infer the meaning of the target words from the context. The participants were asked to verbalize what they would be thinking aloud to passage while inferring the meanings of the meanings of the unfamiliar target words. They were asked to think-aloud by reporting their thoughts when they were inferring the meaning of the words. They were permitted to do the think-aloud in the language they felt most relaxed with it (either their own L1 or English).

Reading comprehension passages

Before commencing the treatment, the participants were asked to read two comprehension passages. The first passage contained 521words, with 10 target words highlighted. The second passage consists of 374 words, with 10 target words highlighted. Students were asked to infer the meaning of the unknown words. Each correct answer was given a score of 1; therefore, the total score of the whole test would be 20.

Materials

Two sets of materials were used in the present study. One was the reading materials and the other one was the list of lexical inferencing strategies taught to students (Kispal, 2008). The reading materials used in the study included reading passages taken from the first 8 unites of "Interaction 2 Reading" book by Hartmann. These passages served as reading materials upon which students learned and practiced lexical inferencing strategies. They also used as the source for choosing target words to be learned by students.

Procedures

After establishing the homogeneity of the participants in terms of language proficiency, then the reading comprehension pre-test (Nation & Beglar, 2007) was given to both groups to control the participants' reading comprehension and further ensure there was no difference between the two groups.

After the pre-test, the control group proceeded with the daily teachings according to the curriculum, while the experimental group was also taught the lexical inferencing strategies. The participants in the control group did not receive any lexical inferencing strategy instruction and just received the traditional method of teaching unknown words such as explanations or providing synonyms about meaning of unknown words. The lexical inferencing strategies to be taught to the participants of the study were taken from the list of lexical strategies identified and classified by Kispal (2008). Based on Kispal' (2008) definition and classification of lexical inferencing strategies, efforts were made to explain them to learners and how and when to use them. Students' behaviors were also observed and monitored by the researchers and at times students were asked to act out the lexical inferencing procedure when encountering an unknown word. Any misunderstandings and misuse of strategies were noted, and the proper way of using them was demonstrated to students. Students were also encouraged to think of similar situations they could use the strategies and their ideas were discussed in class and examples were drawn. While reading the texts, students were supposed to try various strategies and identify the ones they could use more effectively. Finally, the teacher modeled his own way of using the strategies based on his previous experience. This is because teaching students to successfully use context clues is a process that requires modeling, instructional scaffolding, and a great deal of practice, particularly in the case of struggling readers.

The treatment period lasted for 10 sessions and each session was about 90 minutes. During the treatment, reading passages in book "Interaction 2 Reading" by Hartmann were used as the reading materials. At the end of instruction period, the participants in both groups took the reading comprehension posttest and two passages to measure their potential improvement in reading comprehension.

Data Analysis

After the needed data on language proficiency test, reading comprehension test and vocabulary knowledge test were obtained, they were statistically analyzed through SPSS. The data were described using descriptive functions of the software and the statistical technique of one-way ANOVA was used to identify the possible differences between the groups in language proficiency prior to commencing the experimentation and in reading comprehension and vocabulary knowledge before and after the experimentation.

Results and discussion

The pre-test of reading comprehension was administered to both groups at the beginning of the study to examine their initial homogeneity with respect to reading comprehension. Then, the specific treatment was given to the experimental group while the control group received traditional teaching. After ten sessions, both groups took the post-test. The data collected from the reading comprehension test were summed up and were systematically uploaded into a computer for quantitative analyses. The Statistical Package for the Social Science (SPSS) was adopted in the statistical analysis. Consequently, two independent t-tests were run for the difference between the mean scores of the experimental group and the control group on the pre-test as well as the post-test. A paired t-test was run to find the difference between the means of the scores on the following tests: the pre- and post-tests for the control group as well as for the experimental group to see if there was any difference between the performance of the subjects on the pre- and post-tests.

The procedures of descriptive statistics

Pre-test results of reading comprehension between the experimental group and the control group

Before commencing the treatment, a pre-test on the participants' reading performance was administered. After the data collection procedure was completed, the pre-test scores of both experimental and control groups were analyzed by applying an independent sample T-test to determine whether there was any significant difference between the control group and the experimental group in terms of their performance on pre- test at the beginning of the study. As shown in table 2,

The results of the pretest showed that the control and experimental groups (M=12. 27and M=12) were relatively similar. The results of the independent samples T-test between the reading pretest scores of the control and experimental groups indicated that there was not a significant difference between the mean scores of the two groups in pre-test (t= .630). The mean scores of the two groups in pre-test indicated that they had the same level of performance in reading comprehension test at the beginning of the experiment. Thus, it can be concluded that the participants' reading comprehension scores in the two groups were not significantly different prior to the administration of the treatment.

Table 2: A Comparison of the Pre-Test Mean Scores of the Control and Experimental Groups (An Independent T-test) in reading comprehension pre-test

An Independent T-test Results									
Group	Test	N	Mean	SD	Df	T	Sig. (2-tailed)	95%_Confidence Interval_of_the_ Difference	
								Lower	Upper
Control G	Reading Comprehension Test	30	12.27	1.574	58	.630	.531	.581	1.114
Experimental G		30	12	1.702				.581	1.114

Comparison of the reading pre-test and post-test within the group

The data in table 3 indicates that there is a significant difference between the mean scores of the pre-test (12) and the post-test of the experimental group (16.70). Scores of the experimental group in the post-test were greatly higher than those in the pre-test. This considerable improvement shown by the subjects of the experimental group is due to the effect of the exposure to the test-taking strategy instruction, which included presentation and practice on test-taking strategies. This indicates that the participants in the experimental group indeed benefited from the test-taking strategy instruction. This implies that the students in the experimental group improved their reading comprehension significantly after they were taught with regular lessons and the test-taking strategies. The present study also gives us more evidence for the notion that lexical inferencing strategies instruction has an effect on reading tests. This finding obtained from table 2 disagrees with the second hypothesis and assures that there is significant difference between the pre-test and the post test of the experimental group in test-taking strategies.

The students' level of performance in lexical inferencing strategies witnessed a considerable improvement. These remarkably high gains shown by the students of the experimental group in the pre and post-test are due to the effect of the systematic training the students had in lexical inferencing strategies. This finding is similar to that of (Chavosh and Davoudi, 2016; Shen, 2017; Yousefi, and Ahadzadeh, 2017) who report that training improves the attainments of the students in lexical inferencing strategies. On the other hand, table 3 also displays that there is slight significant difference between means of the scores of the control group on the pre-test, post-test basis. This assures that there is no improvement in lexical inferencing strategies. The control group, which received regular instruction, made little progress in tackling the reading items. This may be ascribed to the lack of systematic training in lexical inferencing strategies. According to obtained results, there was support for the second hypothesis stating that there is no significant difference between means of scores obtained by the control group strategies in terms of their performance on the pre-posttest of reading comprehension. On the contrary, there was rejection for

the third hypothesis stating that there is no significant difference between means of scores obtained by the experimental group strategies in terms of their performance on the pre-posttest of reading comprehension.

Table 3: A Comparison of the Mean of the Pre-test and Post-test within the Group () in both reading comprehension test and vocabulary knowledge test

	Paired-samples T-test							
	N	Mean	SD	Df	T	Sig. (2-tailed)	95%_Confidence Interval_of_the_ Difference	
							Lower	Upper
Pair 1 Pre-test of RCT	30	12.27	1.574	58	-7.954	.000	2.011	1.189
Post of RCT	30	13.87	1.502					
Pair 2 Pre-test of RCT	30	12	1.702	58	-12.335	.000	5.479	3.921
Post of RCT	30	16.70	1.622					

A Comparison of the Post-Test Mean Scores of the Control and Experimental Groups

After the end of the treatment which focused on teaching inference skills and strategies explicitly besides the conventional teachings that all participants were exposed to, a post-test on the participants' reading performance was readministered. T-test was used to analyze the difference between means of scores of the control and the experimental groups. As is shown in table (4) below, using t-test revealed that there is a significant difference between means of the scores of the control group and those of the experimental group in the posttest. The experimental group got a higher mean (16.70) than that of the control group (13.87). The results of the independent-samples t-test revealed that the students in the experimental group significantly outscored their counterparts in the control group. Mean scores and standard deviations for the performance of on the test of reading comprehension for both groups showed that the experimental group students had better performance compared with their counterparts in the control group. In other words, there is a significant difference between the two groups after the post-test because the p-value is less than .05. Thus, it can be concluded that the participants' reading comprehension posttest scores in the two groups were significantly different after the administration of the treatment with the experimental group performing better. Additionally, the results revealed that teaching inference skills had a significant and positive impact on the reading comprehension performance of EFL learners.

Table 4**:** A Comparison of the Post-Test Mean Scores of the Control and Experimental Groups in both Reading Comprehension Test and Vocabulary knowledge Test

An Independent T-test Results									
Group	Test	N	Mean	SD	Df	T	Sig. (2-tailed)	95%_Confidence Interval_of_the_ Difference	
								Lower	Upper
Control G	Reading Comprehension Test		13.87	1.502	58	-7.019	.000	3.641	2.025
Experimental G			16.70	1.622					

It was displayed that the students in the experimental group performed significantly better when taking the post-test than those in the control group. Modeling the lexical inferencing strategies enabled students to apply the same thought processes to their own independent work. This form of instruction enabled students in the experimental

group to improve in their abilities to comprehend and respond to text and therefore should be incorporated as an effective form of classroom teaching.
By contrast to the experimental group students, the control group students seemed to use few lexical inferencing strategies to work out the meanings of the unknown words, which may be due to lack of the training on how to use the lexical inferencing strategies.

Think-aloud protocols

The think-aloud protocol in the present study was utilized to investigate Saudi EFL learner's use of different types of lexical inferencing strategies in order to derive the meaning of unknown words from context. Lexical inferencing strategies were defined as any cognitive or metacognitive activity that the learner turned to for help while trying to derive the meaning of the unknown word from context (Anvari and Farvardin, 2016). In order to identify the strategies learners used by Saudi EFL learners, the researcher reviewed many previous studies used the think-aloud protocol. An inductive approach was used so that the transcriptions were read and re-read to identify the strategies learners used. For that purpose, previous research on lexical inferencing (e.g., Nassaji, 2003, 2004; Haastrup, 1991; Chavosh and Davoudi, 2016; Shen, 2017; Safa and Kokabi, 2017; Sadeghi, Gilani, & Niyazi, 2018 Paribakht & Wesche, 1999) as well as on vocabulary learning strategies (Yousefi, and Ahadzadeh, 2017) was also consulted. Based on the reading of the transcriptions, a coding scheme for analyzing the data was adopted from Hu and Nassaji's (2014) study in which twelve types of strategies were identified: analyzing, associating, repeating, using textual clues, using prior knowledge, paraphrasing, making inquiry, confirming/disconfirming, commenting, stating failure or difficulty, suspending judgments and reattempting. Then based on the nature of these strategies they were grouped into four major categories: form-focused, meaning-focused, evaluating, and monitoring strategies.

In order to identify the lexical inferencing strategies used by these learners in the present study, all the protocols were initially transcribed and then carefully examined for any observable inferencing strategies. Lexical inferencing strategies were defined as any cognitive or metacognitive activity that the learner turned to for help while trying to derive the meaning of the unknown word from context. Strategies were identified using an inductive procedure involving reading and rereading the protocols. The strategies identified derive mainly from the data and reflect the thinking of the learners participating in the study. Initially, three main categories of strategy types were identified. Lexical inferencing strategies were defined as any cognitive or metacognitive activity that the learner turned to for help while trying to derive the meaning of the unknown word from context. Strategies were identified using an inductive procedure involving reading and rereading the protocols. The strategies identified derive mainly from the data and reflect the thinking of the learners participating in the study. Initially, three main categories of strategy types were identified. Following Nassaji and Hu (2014), these were characterized as form-focused, meaning-focused, evaluating, and monitoring strategies. Table 5 presents these main strategies, the sub-strategies and their definitions drawn from participants' think-aloud protocols.

Table 5: Overview of Lexical Inferencing Strategy Types (Adapted from Anvari and Farvardin, 2016; 1991, pp. 126-129)

Main Strategies	Sub-strategies	Definitions
form-focused	Analyzing	Analyzing a word into various components, roots, prefixes, suffixes.
	Associating	Attempting to infer the meaning of the target words with other similar words.
	Repeating	The learner repeats any portion of the text, including the word, the phrase, or the sentence in which the word has occurred.
meaning-focused	Guessing from textual clues	Guessing the meaning of the TW by using the surrounding context clues.
	Using prior knowledge	The learner uses his background knowledge of the topic of the text to guess the meaning of the unknown word.

	Paraphrasing /translating	Paraphrasing or translating part of the text that contains the target words.
Evaluating	Inquiry	Self-Inquiry: The learner asks himself or herself questions about the word or the meaning he or she has already inferred.
	Confirming /disconfirming	The inferences made by using the information in the text
	Commenting	Making evaluative comments about the TW
Monitoring	Stating the failure/ difficulty	Making statements about the failure of inferencing or the difficulty of the target word
	Suspending judgment	Postponing the inference making and leaving it for a later time
	Reattempting	Discarding the old inference and attempting to make a new one.

As for the first research question whether the control and the experimental group students in this study employed lexical inferencing to deal with unknown words in reading, the results in this study provided a confirmative answer. After the lexical inferencing strategies were identified, the data were analyzed for the number of correct inferences by each participant. Table 6 demonstrates the total number and frequency of each main strategy and sub-strategy type used by the control and experimental groups. The results of these analyses are presented in Table 6. As it is shown in table 6, the experimental group participants made 1011 lexical inferences, whereas the control group students made 802 inferences. Out of a total of 1011 inferences, 740 correct inferences (73.2%) were made by the experimental group participants. As for the control group, only 369 correct inferences (46%) were made. This finding indicates that the percentage of correct inferences made by the experimental group is higher than that made by the control group. This outperformance of the experimental group the experimental group is attributed to the training in lexical inference strategies.

Table 6: Number and Percentage of Lexical Inferencing Strategy Types Used by the Control and the Experimental groups

Main Strategies	Sub-strategies	Control Group (802)						Experimental (1011)					
		F		Correct		Incorrect		F		Correct		Incorrect	
		N	%	N	%	N	%	N	%	N	%	N	%
Form – focused	Analyzing	83	10.3	35	42.2	48	57.8	112	11	90	80.4	22	19.6
	Associating	74	9.2	28	37.7	46	62.3	90	8.9	59	65.6	31	34.4
	Repeating	63	7.9	34	54	29	46	83	8.2	65	78.3	18	21.7
Meaning – focused	Guessing from textual clues	80	10	41	51.3	39	48.7	125	12.4	94	75.2	31	24.8
	Using prior knowledge	59	7.4	30	50.8	29	48.2	81	8	66	81.5	15	19.5
	Paraphrasing /translating	69	8.6	25	36.2	44	63.8	120	11.7	100	88.3	20	16.7
Evaluating	Inquiry	82	10.2	37	45.1	45	54.9	80	7.9	62	77.5	18	22.5
	Confirming /disconfirming	63	7.9	25	39.7	38	61.3	71	7	48	67.6	23	32.4
	Commenting	54	6.7	25	49.3	29	50.7	59	5.8	40	67.8	19	22.2
Monitoring	Stating the failure/ difficulty	52	6.5	27	51.9	25	48.1	56	5.5	34	60.7	22	39.3
	Suspending judgment	50	6.2	30	60	20	40	54	5.3	28	51.9	26	48.1
	Reattempting	73	9.1	32	43.8	41	56.2	80	7.9	54	67.5	26	32.5

As the table No.6 shows, Saudi EFL learners have a rich repertoire of strategies to infer the meaning of the unknown words. They simultaneously employed more than one strategy (e.g., Form-focused strategies + Meaning-focused strategies +Evaluating strategies +Monitoring strategies).

The findings, as indicated in table, suggest that meaning-focused strategies were the most commonly used strategies (326 inferences) by the experimental group participants which accounted for 32.2 % out of the 1011 strategy counts. They were followed by the Form –focused strategies (28.2%) and by the evaluating strategies (20.8%), and monitoring strategies (18.8%). This can be attributed to the fact that the participants most frequently relied on using contextual clues, both linguistic and non-linguistic, their prior knowledge and paraphrasing.

On the other hand, form-focused strategies were the most commonly used strategies (27.4) by the control group. They were followed by the meaning-focused strategies (25.9%), and by the evaluating strategies (24.8%), and monitoring strategies (21.8%). Analyzing is the first and foremost sub-strategy on this regard. This might be attributed to the fact that associating has saliency among cognitive tasks and hence the participants have propensity to apply the strategy more than the other strategies. It is recommended that language teachers emphasize the strategy teaching reading skill.

From Table 6, it can also be seen that the most frequently used inferencing strategies by the two groups of learners are guessing, paraphrasing, analyzing, and associating. They tried to use such strategies in inferencing the meanings of the unknown words while reading the comprehension passages. On the other hand, the least frequently utilized inferencing strategies by the two groups of learners are commenting, stating difficulty, and suspending judgments.

As shown in Table 6, the highest number of correct inferences made by the experimental learners was with the use of paraphrasing /translating strategy (88.3%), and the highest number of their correct inferences occurred with the suspending judgement strategy (48.1%). As for the control group, the highest number of correct inferences made with the use of suspending judgement (60%), and the highest number of their incorrect inferences occurred with the paraphrasing /translating strategy (63.8%).

In most categories of lexical inferencing strategies, the control group had a higher percentage of incorrect inference than the experimental group (57.8% vs.19.6%; 62.3% vs. 34.4%; 46% vs. 21.7%; 48.7% vs. 24.8%; 48.2vs. 19.5). This means that the control group participants had more difficulties in the use of lexical inferencing strategies, resulting in higher percentage of incorrect guess. The readers' lack of success in lexical inferencing might also be attributed to the learners' inadequate use of required strategy since the appropriate use of different strategies is of critical value for correct inference making.

Table 6 also indicated the total number and frequency of each strategy type used by all participants. For example, guessing from textual clues was the most frequently used strategy type by the experimental group (125 inferences), which accounted for %13.5 out of the 1011 strategy counts. Also, suspending judgement was the least frequently used strategy type with just 54 counts, which was about %5.3 percent. As for the control group, analyzing was the most frequently used strategy type (83 inferences), which accounted for %10.35 out of the 802 strategy counts. Also, suspending judgement was the least frequently used strategy type with just 50 inferences, which was about % 6.2 percent.

The results of the present study displayed that Saudi EFL learners, under some circumstances, simultaneously employed more than one strategy type. They tend to utilize Meaning-focused Strategies (using contextual clues) than any other strategy type. It might be because of the fact that the participants read the text for comprehension purpose. Although participants simultaneously used both strategy types (e.g Analyzing + Paraphrasing), but a small number of participants employed these strategies. I think because they didn't know the strategies and didn't know how they used these strategies.

In general, the results indicated that both of the experimental and control group students used the four categories of lexical inferencing strategies when they inferred the meaning of the unknown word, namely, form-focused,

meaning-focused, evaluating and monitoring strategies. However, the results further indicated that the two groups differed significantly only on the frequency of the strategies used. In terms of the number of inferences made by, it was seen that the students of the experimental group outperformed the students of the control group.

The relationship between the learners' reading comprehension and their lexical inferencing strategy use

With respect to the last research question about whether there is a relationship between the learners' reading comprehension and their lexical inferencing strategy use, Table 7 displays the answers. To determine the significant relationship between the lexical inferencing strategies and the respondents' reading comprehension, Pearson r was the statistical tool used to draw the relationship. In order to determine the relationship between the independent variable (lexical inferencing strategy) and the dependent variable (reading comprehension), correlation coefficient between these two variables calculated at .01 level of significance. The results obtained from these computations are presented in table 7.

Table 7: Pearson Correlations between the Lexical Inferencing Strategy and Reading Comprehension (posttest) for the experimental Group

Correlation			
		Reading	Lexical Inferencing Strategy
Reading	Pearson Correlation		.935
	Sig. (2-tailed)		.000
	N		60
Lexical Inferencing Strategy	Pearson Correlation	.935	
	Sig. (2-tailed)	.000	
	N	60	

**. Correlation is signification at the 0.01 level (2-tailed)

Table 7 shows the correlations between the lexical inferencing strategy, and reading comprehension scores. With regard to the lexical inferencing strategy as another variable of the study, as far as the results of the above statistical analysis reveal, there was a high and significant correlation between this variable and reading comprehension ($r = .935$, $p < .01$) which suggests that lexical inferencing strategies help learners comprehend the text better. Furthermore, there is a direct and significant relationship between lexical inferencing strategy scores and reading test scores of students, and by increasing lexical inferencing strategy lexical inferencing strategy scores, reading test scores had been increased and vice versa. So, the second hypothesis was rejected and can be claimed that there is relationship between lexical inferencing strategy and the experimental group learners' reading comprehension performance.

As for the control group, there was a strong positive correlation ($r = .931$, $p < .01$) between the use of lexical inferencing strategies and the reading comprehension test (See table 8). The results also indicate that there was significant relationship between the results on the reading comprehension test and the lexical inferencing strategies used by learners.

Table 8: Pearson Correlations between the Lexical Inferencing Strategy and Reading Comprehension (posttest) for the Control Group

Correlation			
		Reading	Lexical Inferencing Strategy
Reading	Pearson Correlation		.931
	Sig. (2-tailed)		.000

	N		60
Lexical Inferencing Strategy	Pearson Correlation	.931	
	Sig. (2-tailed)	.000	
	N	60	

**. Correlation is signification at the 0.01 level (2-tailed)

Discussion

The present study investigated the effects of lexical inferencing strategies on reading comprehension ability of EFL learners and also the relationship between inference (lexical and global) and English (L2) reading comprehension. Further, it examined the types of lexical inferencing strategies used by the control and experimental groups. The overall results of the independent sample t-test revealed a significant difference between both experimental and control groups in terms of reading comprehension test. This finding indicates that there is a remarkable improvement in the performance of the experimental group in comparison with that obtained by their counterparts in the control group. This shows that the lexical inferencing strategies instruction did have a significant effect on the Saudi EFL students' reading comprehension test performance. Additionally, findings revealed that inference skills positively influence reading comprehension ability among EFL learners. Thus, the results of the present study are in line with the findings of other similar studies that have probed the impacts of lexical inferencing strategies on reading comprehension of EFL learners (Wang, 2011; Kaivanpanah, & Moghaddam, 2012; Chavosh and Davoudi, 2016; Shen, 2017; Yousefi, and Ahadzadeh, 2017; Safa and Kokabi, 2017; Sadeghi, Gilani, & Niyazi, 2018; Hassanzadeh, Tamjid & Ahangari, 2019). They all supported that lexical inferencing strategies instruction improved the EFL students' reading comprehension test performance. Collectively these results confirm the benefits of providing students with instruction in reading comprehension and lexical inferencing strategies.

The overall results also show that the total number of lexical inferencing strategies used by the experimental group was 1011 inferences, whereas the control group participants made 802 inferences. In their turn, the experimental group subjects outperform the control group participants in the number of inferences which represents 55.7% of the total number of strategies. The types of lexical inferencing strategies used by both the control group and experimental group level subjects, together with corresponding quantitative results are shown in the Table 6. This increase in the number of inferences made by the experimental group subjects is attributed to the instruction in lexical inferencing strategies. These results correlate with those obtained in other studies in that there is a relationship between learners' reading comprehension and their ability to succeed in inferring meanings of unknown words in reading comprehension tasks (cf. Buslon & Alieto, 2019; Yousefi and Ahadzadeh, 2017; Nassaji and Hu, 2014; Jelić, 2007; Paribakht and Wesche 2006, Qian 2005 and Nassaji 2004). These findings add to the general understanding of the complex nature of L2 lexical inferencing, and have shown the crucial importance of vocabulary knowledge for successful inferencing.

This study also supports the significant relationship between lexical inference ability and reading comprehension. This finding is compatible with that resulted from the studies conducted by Sadeghi et al., (2018), Buslon, & Alieto (2018), Chegeni & Tabatabaei (2014), Awani (2013), Tavakoli and Hayati (2011), Nakagawa (2006), and Seng (2007). Their justification for this finding is the participants' scores in reading comprehension test which showed much variation. As previously mentioned, the experimental group subjects' use of lexical inferencing strategies was higher than that of the control group learners, and their reading comprehension scores were also higher than that of the control group students. The degree to which the learners were able to infer word meaning successfully was related to the instruction that they receive in lexical inferencing strategies.

The findings of the present study also revealed that lexical inferencing strategies are important in reading comprehension and can contribute to the ability of EFL learners to understand the text more effortlessly (Van Zealand, 2014). This study also indicated that EFL learners who are more competent in inferring the meaning of unknown words from the context and immediate co-text are better readers and comprehend the deeper meaning of the text compared to those with lower lexical inferencing strategies. In addition to the ability of making informed

guesses about the immediate unknown words and facts within a text, being able to retrieve the underlying meaning of the whole text and bearing all key information in mind plays an important role in comprehending a passage. Hence, lexical inferencing strategies help readers create a comprehensive mental model (Sadeghi et al., 2012 and Buslon, J., & Alieto, 2019). Lexical inferencing strategies help readers understand the underlying meaning instead of the literal meaning, which should enhance comprehension of the written text.

Consequently, there was a strong and positive relationship between lexical inferencing strategies and reading comprehension in English among EFL learners. The results of this study also showed that teaching inference skills significantly affect reading comprehension ability. Explicit instructions and teaching methods to read efficiently also help learners to develop their reading comprehension.

Conclusion

The main purpose of this research study is, firstly, to investigate the effect of the lexical inferencing strategy instruction on the Saudi EFL learners' reading comprehension. Secondly, the present study sought to identify types of lexical inferencing strategies used by Saudi EFL learners in order to derive the meaning of unknown words from context. Thirdly, the study intends to explore whether there is a relationship between the types of lexical inferencing strategies used Saudi EFL learners and their reading comprehension. Sixty students participate in this study; control group (30 students) and experimental group (30 students). The data collected for the study were elicited by means of the following tools: Oxford Placement test, a reading comprehension task, reading comprehension test and think-aloud protocols. Moreover, participants read two passages containing 20 unknown words and attempted to derive the meanings of the unknown words from context. Introspective think-aloud protocols were used to discover the degree and types of inferencing strategies learners used. The results of the comprehension test showed that there was a significant difference between the means of scores gained by the experimental group and that of the control group favoring the experimental one. This finding also revealed that the use of the lexical inferencing strategies had significantly affected to students' reading comprehension performance. Moreover, results of the paired t-tests showed that lexical inferencing instruction had a statistically significant effect on EFL learners' reading comprehension development. The results of the verbal report indicate that both of the control and experimental group students used the four categories of lexical inferencing strategies when they performed a reading task, namely, form-focused, meaning-focused, evaluating and monitoring. The number of inferences used by the experimental group learners was higher than that used by the control group learners (1011 versus 802). The finding also displays that there is a strong a relationship between the type of lexical inferencing strategies used and EFL learners' reading comprehension. In sum, these findings add to the general understanding of the complex nature of EFL lexical inferencing, and have shown the crucial importance of vocabulary knowledge for successful inferencing.

Suggestions for Further Research

Considering the findings of this study, the following areas are worthy of further investigation.

1. A similar study can be carried out with female EFL students, and the results can be compared with those of this study to see whether the participants' gender may affect their pattern of lexical inference.
2. Bearing in mind that the number of subjects participating in the study was small, it is not possible to generalize the findings to a wider population. Therefore, in future research it would be necessary to include a larger number of participants.
3. Besides, it would be useful to do research into the lexical inferencing strategies used by students who have different purposes in studying English as a foreign language (e.g., science students).

References

Al Fraidan, Abdullah (2011) *Test-taking strategies of EFL Saudi university-level learners on two varieties of gap-filling vocabulary achievement tests*. Ph.D. Thesis. University of Essex, UK.

Amer, A. And Ghabelju, M.2013. Test taking strategies instruction and Iranian EFL learners' performance on international language tests. *International Journal of Applied Linguistics & English Literature* Vol. 2 No. 1; January

Anvari, S. and Farvardin, M. (2016). Revisiting lexical inferencing strategies in L2 reading: A comparison of successful and less successful EFL inferencers. *The Reading Matrix: An International Online Journal, VL - 16*

Awni Etaywe (2013). Lexical inferencing strategies by learners of English as a foreign language, Munich, GRIN Verlag, https://www.grin.com/document/353465

Bengeleil, N & Paribakht, T.S. (2004). L2 reading proficiency and lexical inferencing by university EFL learners. *The Canadian Modern Language Review*, 6 (2), 225-251.

Brown, H. D. (2007). *Principles of language learning and teaching*. New York: Pearson Education.

Buslon, J., & Alieto, E. (2019). Lexical inferencing strategies and reading comprehension in English: A case of ESL third graders. *Asian EFL*, 22(1), 73-94.

Cai, W. & Lee, B., P., H. (2010). Processing unfamiliar words: Strategies, knowledge sources, and the relationship to text and word comprehension. *The Canadian Journal of Applied Linguistics*: 15 (1). 122-145.

Chavosh, M., & Davoudi, M. (2016). The effect of explicit teaching of lexical inferencing strategies on the vocabulary learning among Iranian field-dependent and independent EFL learners. *Studies in Literature and Language,* 12 (4), 44-53. Available from: http://www.cscanada.net/index.php/sll/article/view/8296. DOI: http://dx.doi.org/10.3968/8296

Chegeni, N. & Tabatabaei, O. (2014). Lexical inferencing: The relationship between number and density of lexical items and L2 learners' reading comprehension achievement. *Journal of Language Teaching and Research*, 5 (2) , 306 -312.

Chi, F. & Chern, C. (1988). The study of English teaching and learning in senior high school. In Tavakoli, M. & Hayati, S. (2011). The relationship between lexical inferencing strategies and L2 proficiency of Iranian EFL learners. *Journal of Language Teaching and Research*, 2 (6), 1227 - 1237. doi:10.4304/jltr.2.6.1227-1237.

Edwards, (2007). Solutions: Placement Test Elementary to Intermediate. Oxford.

Haastrup, K. (1991). *Lexical inferencing procedures or talking about words.* Tubingan: Gunter Narr.

Hassanzadeh, Z., Tamjid, N., Ahangari, S. and Agudo, J. (2019). The effect of lexical inference strategy instruction on Iranian EFL learners' vocabulary depth and breadth. *Cogent Education, Vol.6, Issue1*.

Hagaman, J. L., Casey, K. J., & Reid, R. (2016). Paraphrasing strategy instruction for struggling readers. Preventing School Failure, 60, 43-52.

Jamil, A., Aziz, M. S., A. &Razak, N., A (2010).The utilization of test-taking strategies among female students in a tertiary institution. *GEMA Online Journal of Language Studies*, 10(3), 105-125.

Jelić, A.-B. (2007). Lexical inferencing strategy use by Croatian foreign-language learners. In J. Horváth & M. Nikolov (Eds.), UPRT 2007: *Empirical studies in English applied linguistics (pp. 245-254). Pécs: Lingua Franca Csoport.*

Julianna, J. (2017). The comparative impacts of using lexical glossing and inferencing strategies on students' reading comprehension. *Advances in Language and Literary Studies*, 9 (1), 1-4.

Ilter, I. (2018). Effects of the Instruction in inferring meanings from context on the comprehension of middle school students at frustration reading level. *Journal of Education.* Vol. 198(3) 225–239

Kaivanpanah, S. & Moghaddam, M.S. (2012). Knowledge sources in EFL learners' lexical inferencing across reading proficiency levels. *RELC Journal*, 43 (3), 373 - 391. Doi: 10.117/0033688212469219.

Kashkouli, Z. &Barati, H., &Nejad Ansari, D. (2015, A). An investigation into the test-taking strategies employed for a high-stake test: Implications for test validation. International *Journal of Research Studies in Language Learning*, 4(3), 61-72. http://dx.doi.org/10.5861/ijrsll.2014.852

Kispal, A. (2008). Effective Teaching of Inference Skills for Reading: Literature Review. National Foundation for Educational Research. ISBN 978 184775 141 6

Muikku-Werner, P. (2017). Lexical inferencing and the mutual intelligibility of Estonian and Finnish. *Nordic Journal of Linguistics*, 40 (2), 201 - 223.

Nakagawa, C. (2006). The effects of morphological and contextual clues on EFL readers' lexical inferencing. *ARELE: Annual Review of English Language Education in Japan*, 17, 151-160.

Nassaji, H. (2003). L2 vocabulary learning from context: Strategies, knowledge sources, and their relationship with success in L2 lexical inferencing. *TESOL QUARTERLY,* 37 (4), 645 - 670.

Nassaji, H. 2006. The relationship between depth of vocabulary knowledge and L2 learners' lexical inferencing strategy use and success. *The Modern Language Journal,* 90, pp. 387-401.

Nassaji, H. and Hu, H. (2014). Lexical inferencing strategies: The case of successful versus less successful inferencers. *System Volume 45*, Pages 27-38

Parel, R. (2004). The impact of lexical inferencing strategies on second language reading proficiency. *Reading and Writing: An Interdisciplinary Journal*, 17 (9) , 847–873.

Paribakht, T. S. (2005) The influence of first language lexicalization on second language lexical inferencing: A study of Farsi-speaking learners of English as a foreign language, Language Learning, 55(4), 701–748. https://doi.org/10.1111/j.0023-8333.2005.00321.x.

Paribakht, T. S. & Wesche, M. (1997). Reading and incidental L2 vocabulary acquisition: An introspective study of lexical inferencing. *Studies in Second Language Acquisition*, 21, 195-224.

Radojevic, N. (2009). *Exploring the use of effective learning strategies to increase students'reading comprehension and test taking skills.* Unpublished Master, Brock University, St.Catharines, Ontario.

Riazi, A. and N. Babaei. 2008. Iranian EFL female students' lexical inferencing and its relationship to their L2 proficiency and reading skill. *The Reading Matrix* 8 (1): 186-195.

Sadeghi, A., Gilani, L., and Niyazi, M. (2018). The effect of inference skills on reading comprehension among EFL learners. *Pakistan Journal of Language Studies*. Vol. 2, Issue 1

Safa, M.A & Kokabi, M.Y. (2017). The role of lexical inferencing and morphological instruction on EFL learners' reading comprehension development. *Iranian Journal of Applied Language Studies*, 9 (1), 1- 32.

Seng, G. H. (2007) The effects of think-aloud in a collaborative environment to improve comprehension of L2 texts, *The Reading Matrix*, 7(2), 29–45. http://www.readingmatrix.com/articles/ seng/article.pdf.

Shen, M.-Y. (2009). Technical university EFL learners' reading proficiency and their lexical inference performance. *Electronic Journal of Foreign Language Teaching - Center for Language Study*, 6 (2), 189 - 200.

Smith, P., Kim, D., Vorobel, O., and King, J. (2019). Verbal reports in the reading processes of language learners: A methodological review. *Review of Education*, Volume 7, Issue 2 Pages: 235-451 DOI: 10.1002/rev3.3170

Tavakoli, M. & Hayati, S. (2011). The relationship between lexical inferencing strategies and L2 proficiency of Iranian EFL learners. *Journal of Language Teaching and Research*, 2 (6), 1227 - 1237. doi:10.4304/jltr.2.6.1227-1237.

Shen, M.-Y. (2017). The role of text type and strategy use in L2 lexical inferencing. *International Review of Applied Linguistics in Language Teaching*, 56 (2), 1-21.

Stern, H.H. (1992). *Issues and options in language teaching*. Oxford: Oxford University Press.

Van Zealand, H. (2014). Lexical inferencing in first and second language listening. The Modern Language Journal, 98(4), 1006-1021. DOI: 10.1111/modl.12152.

Wang, Q. (2011). Lexical inferencing strategies for dealing with unknown words in reading—A contrastive study between Filipino graduate students and Chinese graduate students. *Journal of Language Teaching and Research*, 2 (2), 302-313.

Yousefi, M. and Ahadzadeh, M. (2017). Iranian intermediate EFL learners' vocabulary inferencing strategies: A qualitative study. *Theory and Practice in Language Studies,* Vol. 7, No. 7, pp. 533-539, July 2017 DOI: http://dx.doi.org/10.17507/tpls.0707.05

The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 113-121
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.178

Analyzing Plans of Localizing Professional Development of the Ministry of Education in Kuwait Based on TPACK Model for the Rolling Out Competency-Based Curriculum

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Abstract
The aim of this study was to investigate the localized training for teachers during the reform of the education system in Kuwait between 2015 and 2017. It focuses on analyzing the professional development plans that were delivered to teachers for four core subjects in elementary and middle public schools. A mixed-method approach was employed, using quantitative one-way ANOVA and in-depth interviews and school visits to collect and analyze data. The results revealed that stakeholders and education leaders lacked clarity of purpose with respect to planning for professional development and did not rely on a cohesive framework for training teachers, resulting in discrepancies among all training plans. The study concludes with recommendations for the adaptation of a national framework for professional development based on educational theory and teachers' needs.

Keywords: TPACK Model, Competency-Based Curriculum, Teachers' Training, Reform Curriculum, Localized Training, Professional Development, Mixed Method, Master Trainer, Supervisors, World Bank

Introduction

Kuwait has embarked upon a major reform of its public education system, including revision of the curriculum for grades 1 through 12. As the centerpiece of the country's broad education reform agenda, the Ministry of Education, with technical support from the World Bank and under the umbrella of the integrated reform program agreement, were trying to shift from a content- to a competency-based approach to teaching and learning at the primary, intermediate and secondary levels of education. Kuwait's adoption of a competency-based curriculum aimed to equip its children and youth with the skills, values and capacities needed for future learning, as well as entry into employment and adaptability in the workplace for increased global competitiveness (Alazmi, 2018).

Introduction of the new competency-based curriculum has been planned over a five-year period for use in all schools and classrooms across the country. Drawing on best practices and lessons learned elsewhere, the new curriculum has been developed based on a new Kuwait National Curriculum Framework, which describes the conceptual foundations for the new curriculum and serves as the main reference document for the development of

teaching plans at each level of education, subject curricula and teaching and learning resources for students and teachers. The new curriculum in Kuwait's schools includes: development of a new system for continuous assessment, shifting from examination-based student assessment, particularly at the primary level; (ii) competency-based teaching-learning materials; and (iii) school-based continuous professional development to support teachers' professional practice in their own schools and classrooms (Singer, Samihaian, Holbrook, & Crisan, 2014).

Training requires high competency levels in the transfer of experience and a thorough understanding of the training materials. This research, with its analyses and recommendations, can be used as a first step toward a roadmap for the career-long professional development of teachers in Kuwait and a basis for the formulation of policies on which a Teacher Education Strategy and a National Teacher Framework can be built.

In preparation for the implementation of the *Kuwait National Curriculum*, 65 *Technical Supervisors* have been trained as '*Master Trainers'*. These, in turn, trained 340 of their colleagues who subsequently delivered curriculum-related training to the teachers involved in the rollout of the KNC at the elementary and middle school levels. The World Bank has trained master trainers for competency-based curriculum, resulting in expansion of the training among all teachers in Kuwait. The roll-out of the curriculum created new professional development to be employed in school (localized training) (Alshammari, 2014).

As in all clinical training, it is necessary to find methods of ensuring that the training reaches down by way of mentoring and coaching to individual teachers in their own classrooms if implementation of the new KNC is to be effective, and the gap between curriculum theory and actual practice is to be bridged. If adequate provision is not made for coaching and mentoring of individual teachers, effective reform of teaching and learning, as envisaged in the KNC, will take much longer. Thus, in this research, plans for localizing training provided by the public education sector was examined in the four core subjects (Arabic, Math, Science, English) to answer the following:

- How many training courses are prepared by each supervisory for each subject?
- What are the elements included in the training based on TPACK (educational/technological/specialized (content-related) or integrated)?
- What is the duration of the localization plan? Who is involved in training? What are the stages covered by the training resettlement plan? And why the fixed schedule of the plan to localize training?

Literature Review

Guskey (1995) issued a salutary warning to those planning educational reform. He wrote,

> "There is no easier way to sabotage change efforts than to take on too much at the same time. …If there is one truism in the vast literature on change, it is that the magnitude of change people are asked to make is inversely related to their likelihood of making it" (p. 119).

Consequently, he recommends approaching change in a gradual, incremental manner, that is, 'thinking big' (i.e. having a clear vision and comprehensive plan) but 'starting small'. Furthermore, he argues that that the process through which effective change occurs among teachers is not a linear process from theoretical persuasion to practical implementation. Rather, teachers are persuaded of the value of proposed changes when they experience successful implementation on their part and improvement outcomes on the part of students. In other words, change is primarily an experientially-based learning process for teachers. Attitudes change in the face of concrete, experienced, evidence of positive outcomes. Simply put, for teachers, 'seeing is believing', practice is more persuasive than theory, and in a very real sense, precedes theory. Any professional development program that neglects these on-the-ground realities is unlikely to effectively motivate teachers.

Teachers share a significant responsibility in preparing young people to lead successful and productive lives. There is a broad consensus that teacher quality is the single most important in-school factor influencing student

achievement[1]. Sustained professional development for teachers is associated with more positive and stimulating teacher behavior and positive student outcomes. When designed well, these opportunities help teachers master content, improve teaching skills and address challenges faced in the classroom (Lewin & Stuart, 2003).

However, the professional development in Kuwait is still in need of development to fulfill the teachers' requirement. Technical Supervisors in Kuwait have the formal responsibility for the provision of professional development for teachers. Formal responsibility for the provision of INSET and CPD for teachers in Kuwait rests with the Technical [Subject] Supervisors. There are eighteen General Supervisors, each of whom is responsible for one of the 18 subjects in the National Curriculum. The General Supervisors produce 18 plans each year for teacher training, which is delivered either through one-week courses in one of the training centers or through one-off workshops in district centers or in schools.

While shifting the national curriculum of Kuwait to competency-based curriculum starting in 2016, the education field needed incentive amount of induction and training for teachers to adopt to the new curriculum. However, many researches have indicated that Kuwait's education system does not provide adequate programs for its teachers, especially during the reform period. Alshammari (2014), who explored the perspectives and the role of science teachers concerning the new science curriculum for the sixth and seventh grades (students aged 11 to 15) in Kuwait, indicated that the top-down paradigm was the process of changing the science curriculum at the Ministry of Education. He pointed out that teachers were confused about the content and teachers faced challenges in teaching the new science curriculum (Alshammari, 2014). He also reported that teachers faced challenges related to lack of instructional tools and teacher autonomy, the condensed content that needed covering and large class sizes. Alshammari (2014) reported that in carrying out curriculum reform, the Ministry of Education must consider professional development program for teachers to assure the success of the implementation.

Another study found that teachers' perceptions regarding professional development programs being provided by the Ministry of Education of Kuwait were negative (Alqahtani, 2018) He also stated that teachers view professional development as extra information that is not applicable in the classroom context, and there is a mismatch between the programs and teachers' demand, as they do not certify them since most of the professional development programs are informal (Alqahtani, 2018). Moreover, even teachers' learning communities (TLC) at public schools face similar challenges in application, such as enabling teachers to apply new methods due to lack of autonomy and lack of leadership support (AlShammari, Testerman & Halimi, 2020).

Finally, a study focused on investigating the perceptions of teachers and heads of departments of the recent reform implementation plan by Alazemi (2018) concluded that educational leaders did not provide the support needed for schools during the change of the system. Alazemi (2018) added that there was not a clear structure nor cohesive professional development plan for teachers or any information and communications technology (ICT) structure, as well as a lack of autonomy. Yet the absence of support from stakeholders forced many schools to take their own initiatives in terms of providing professional development needed for their teachers (Alazemi, 2018).

Method

A mixed-method approach was employed to explore and answer the research questions and obtain a complete understanding of the entire situation related to the training. In-depth analytical reading to the training program, focus groups, visits for training sessions and interviews were conducted to understand the sources, background and rationales behind each training course. Therefore, a request has been sent to the General Education Department to obtain a copy of all the localized training programs for the first year (2016) and the second year (2017). Then, all the plans were categorized based on TPACK according to their descriptions in the pamphlets. One-way ANOVA was conducted to compare the effect of each core subject planning on the number of training

[1] Organization for Economic Co-Operation and Development (OECD), Teachers matter: Attracting, Developing and retaining effective teachers, Paris, OECD Publishing, 2005.

for teachers in schools. The second phase of the data collection relied on in-depth interviews with the general supervisors of the core subjects to ascertain more about their planning.

Coding Strategy

The professional development that was conducted during 2016–2017 was explored based on multiple trainings in terms of pedagogical, content and technological knowledge among teachers at both the elementary and middle school levels. Each training was classified as one on the TPACK model. The acronym TPACK refers to what Koehler and Mishra (2005) defined as "Technology Pedagogy and Content Knowledge," and these three essential elements (technology (TK), pedagogy (PK), and content (CK), as shown in Figure 1) are recognized as the elements for teachers, where they need to be competent in the three domains for teaching quality (Kartal & Afacan, 2017). Not only are teachers required to understand relevant content knowledge, they also need to know how to convey this content to their students. At the same time, they need to adapt and update their technological knowledge to keep up with technical and lifestyle developments (Kartal & Afacan, 2017). Each learning activity was classified as only one of the three categories of TPACK or any form of integration between any of the categories.

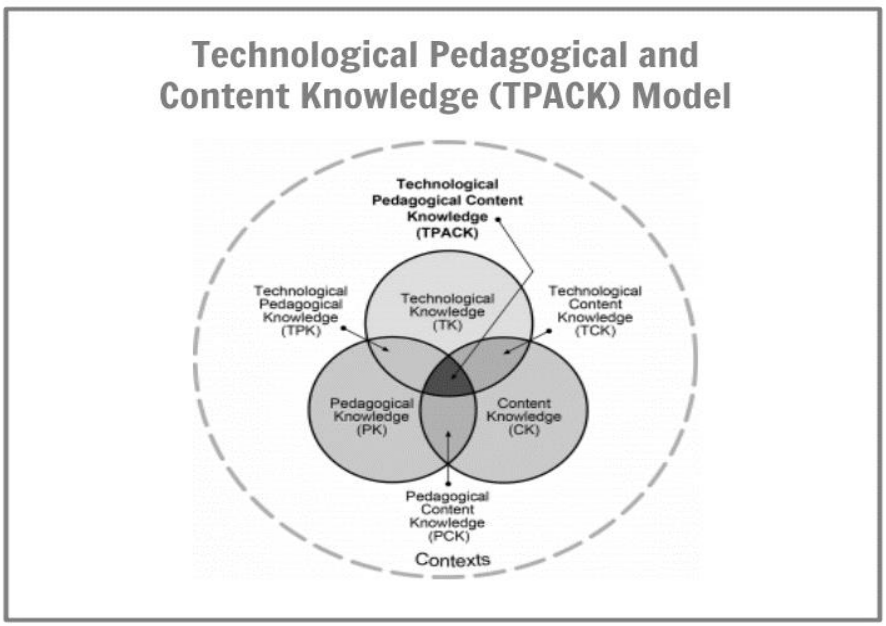

Figure 1. TPACK Model

Findings

Quantitative Results

All core subjects were categorized for both year 1 (2016) and year 2 (2017), as shown in Figures 2 and 3. Both plans did not apply all TPACK fields especially when it comes to technology. There was a marked discrepancy between the number of training sessions on the material level, which is due to the nature of each subject. This raised an important question: "what were the bases of building the training model?"

In Figure 2, the distribution of the type of localized training was mostly attributed to courses related to pedagogy and pedagogy (116ontente-based). Also, the number of training hours reflects discrepancies and only the 116ontent subject training contained the three fields of pedagogy, technology and 116ontente knowledge. The second year was not 116ontente116 from the first year, as shown in Figure 3, where the training clustered mostly around pedagogy and 116ontente, while technology was largely absent.

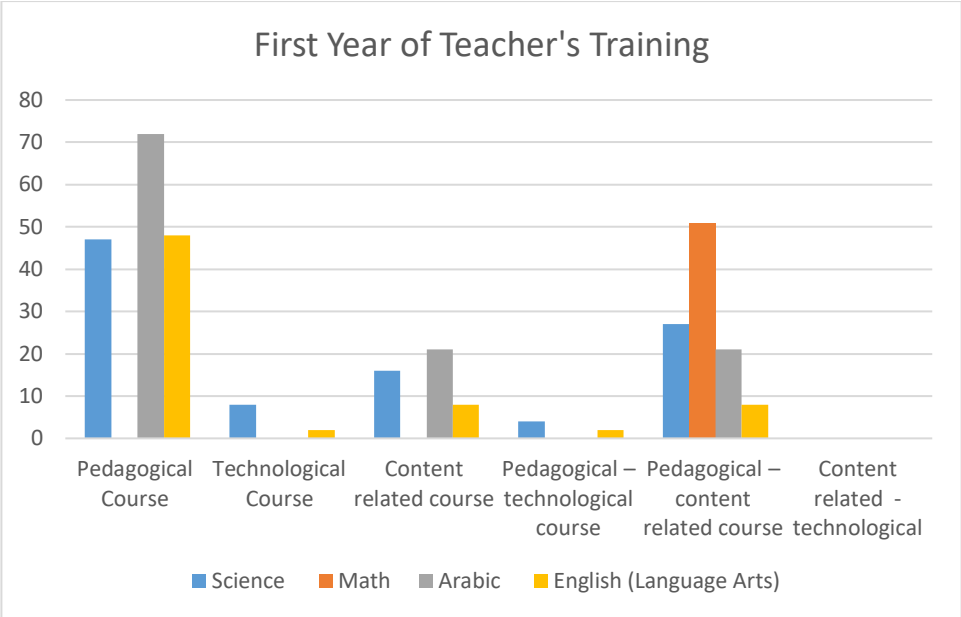

Figure 2: First Year of Teacher's Training

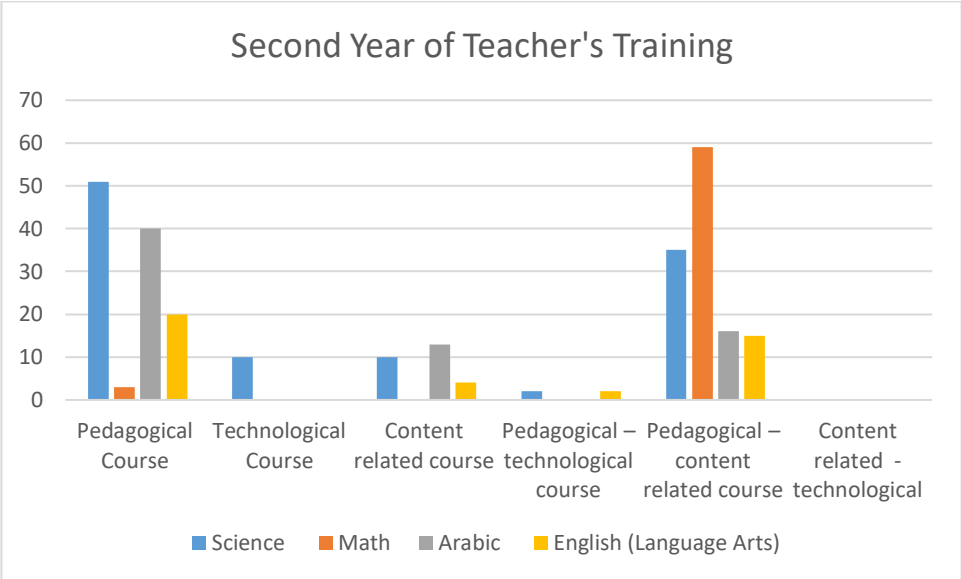

Figure 3: Second Year of Teacher's Training

An analysis of variance for the first year of the training plans showed that the effect of each core subject plans on the number of training among the four subjects was significant, F (3, 20) = 0.30, p= 0.819. The second year was not different in terms of the significance, so the analysis of the variance for the second year showed that the effect of each core subject plans on the number of training among the four subjects was significant, F (3,20) = 0.39, p= 0.754. Apparently, the huge differences among each subject and even the variation between the first and second year indicates the lack of coherent framework or guidance. The numbers were discussed in the second phase of the study when interviews were conducted with the main stakeholders.

Table 1: Single Factor Year 1

Anova: Single Factor (Year 1)

Groups	*Count*	*Sum*	*Average*	*Variance*
Science	6	102	17	308
Math	6	51	8.5	433.5
Arabic	6	114	19	780

English (Language Arts)	6	68	11.33333	333.8667		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	428.125	3	142.7083	0.307666	0.819548	3.098391
Within Groups	9276.833	20	463.8417			
Total	9704.958	23				

Table 2: Single Factor Year 2

Anova: Single Factor (Year 2)						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Science	6	108	18	417.2		
Math	6	62	10.33333	569.8667		
Arabic	6	69	11.5	246.3		
English (Language Arts)	6	41	6.833333	72.96667		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	391.6667	3	130.5556	0.399762	0.754662	3.098391
Within Groups	6531.667	20	326.5833			
Total	6923.333	23				

Qualitative Results

To understand the rationale behind the amount of training needed for each core subject, in-depth interviews were conducted with the four core subject general supervisors to know about the planning part. Table 3 summarizes the four main questions that were addressed to the four general supervisors. Supervisors answers varied when asking about the person prepared the professional development (PD) plans, which may reflect the discrepancies between Figures 2 and 3 above. Moreover, the lecture was most of the training style which also cannot be considered training.

Table 3: Interviews

Subject	Why the fixed schedule	Who prepared the PD plans?	Who conducted the training?	Training Style	Did you stick to the plan? And why?
Language Arts (English)	General education and school districts	Diagnostic assessment with teachers' need in the beginning of school year.	Supervisors and or Head of Department (HOD)	Lecture	The trained ones only from Supervisors and HOD
Math	The World Bank visits	The trained educators and the authors	The trained educators +Supervisors & HOD	Lecture	Who was trained and capable
Science	General education and for World bank visits	Supervisors	Supervisors and HOD	Lecture and workshop	Who was trained and capable
Arabic	General education and school districts	Supervisors and schools	Supervisors and or HOD	Lecture	Who was trained and capable

In terms of the school visit, one sixth-grade training session based on the competency curriculum was attended. This was followed by a meeting to discuss applications, compare it with other regions and the extent of application for other school districts, which was followed by a training session. Discussion was held between the supervisors of the various educational districts about the pros and cons in the lesson. We were provided with regular presentation based on the plan for localization of training, which included an explanation of the lessons and applications according to the competency curriculum.

Discussion

The aim of this document was to review current provision for the professional development of Kuwaiti teachers across the continuum of their professional development training within the guiding context of the new Kuwait National Curriculum. While the review does not present a blueprint for action, nor was it meant to, it is hoped that the analyses and recommendations provided therein will help identify the first steps towards the provision of a roadmap for the career-long professional development of teachers in Kuwait and provide a basis for the formulation of policies on which a Teacher Education Strategy and a National Teacher Framework can be built.

Current thinking suggests the professional development of teachers is viewed as a continuing process that needs to contain content, pedagogical and technological knowledge. While shifting the national curriculum of Kuwait to competency-based curriculum starting in 2016, the education field requires incentives and training for teachers to adapt to the new curriculum. The training is delivered either through one-week courses in one of the training centers or through one-off workshops in district centers or in schools. This training is largely subject or pedagogical-related. It is determined in a top-down manner by the Supervisors with little or no consultation with teachers as to their need (Alqahtani, 2018).

The training was largely subject or pedagogical-related. It was determined in a top-down manner by the Supervisors with little or no consultation with teachers with respect to their needs. The evidence from a broad range of methods strongly suggested that the mode of training delivery was formal, lecture-oriented, and did not normally entail much hands-on involvement of the participating teachers. Unfortunately, the written portion of the program was not clearly translated into the action plan especially in the training part. Poor implementation resulted in a failure to transfer the correct information. In addition, the training programs were not described except for the science. The science supervisory described the preparations for the training programs and the development of general guidelines only. Most of the training was missing the technology component. There was no clear methodology for laying the training groundwork.

The focus on strengthening the educational aspect of the program is important, and its presence was noted in all plans for the resettlement of training, which is positive. There was a marked discrepancy between the number of training sessions on the material level. One-off workshops are arranged by supervisors on an ad-hoc basis and are delivered in District Training Centres and/or in a central school convenient for teachers from a cluster of schools. Like the training courses, these too are generally subject-related.

The analysis suggests that the quality and relevance of supervisor-provided training courses and workshops is mixed, that they tend to be theory-oriented, general and generic in orientation, and inadequately targeted at the pedagogical content knowledge relevant to the effective teaching of individual subjects and the needs of the teachers involved. Regarding such isolated training inputs, Fullan (1991) commented, “Nothing has promised so much and has been so frustratingly wasteful as the thousands of workshops and conferences that led to no significant change in practice when teachers returned to their classrooms”. The whole approach runs counter to the research evidence on effective professional development for teachers, which are cited as part of the recommendations in this paper.

Training requires high competencies in the transfer of experience and a thorough understanding of the training material. The training of heads of departments include a week to transfer knowledge, which is not enough, and negatively affected the transfer of the actual material, thus affecting teachers’ understanding of the curriculum competencies.

Conclusion

Quantitative analysis and a qualitative approach were both used to analyze the process of localizing training in public schools of Kuwait based on TPACK model. It is acceptable to set up the plan to localize the training and enrich the educational field with new curriculum techniques and provide them with ongoing training. However, the critical part remains and is innovative, providing teachers with their needs rather than top-down or uncategorized type of training. It was noticeable from the results that there was no clear vision regarding how to determine the training for teachers.

During a radical change and transitional phase in any reform program, the program itself could face such challenges while changing the national curriculum, but it should be noted that well-planned training program must be studied and implemented correctly prior any execution. Yet, supervisors should not work in isolation. Rather, they should plan in terms of self-evaluation of teachers' need, and training programs should be a combination of a vision for development by guidance and an actual need of teachers through surveying or any other methods.
The evidence indicated that teachers experience much more powerful learning when professional development is related to their identified/felt needs, directly connected to their work with students, linked to subject matter and the concrete tasks of teaching as outlined in national curricula, organized around problem-solving and sustained over time by regular contacts and inputs. The implications of this evidence for professional development provision in Kuwait, as elsewhere, include the following:

On planning for training localization:

- Prepare training plans based on two considerations (vision guidance and teacher needs).
- The development of exercises that integrate the actual needs in the field and the latest educational innovations that the Ministry of Education seeks to continue.
- Increase the integration of teachers with outstanding experience in planning and implementing training programs in accordance with the frameworks and controls.
- Establish clear criteria for training to be organized in equal proportions.
- Activate the teacher self-assessment, adapt the needs of the teachers and plan the localization of training.
- Blogging, documentation and compliance are among the most important factors that will help the field improve training and develop it.

For training materials and methods:

- Develop specific frameworks to guide the development of training without neglecting any particular aspect (e.g., educational, specialized, administrative, or technological).
- To find a balance between the three training components of the educational, cognitive and technological head without neglecting any of the other components needed in the field (e.g., administrative).
- Increase technology topics and employ them in the competency curriculum.
- For active learning, training must be active, and it should increase the number of workshops and practices and reduce the lecture style.
- Use of the centers available to develop and support the guidance towards upgrading the training as well as the head of the department.
- Archive of plans and educational programs and the use of the curriculum sector on the work of publications in the training programs or lessons annotated and uploaded electronically on the website of the Ministry of Education.
- Link professional development and training as an integral part of supervisory functions.

References

Alazemi, J. (2018). *The perceptions of classroom teachers, heads of department and head teachers of the effectiveness of recent policy reforms in middle schools in Kuwait (2005-2015)* (Doctoral dissertation, University of Reading).

Alqahtani, A. (2018). Teacher Perceptions of Professional Development in Kuwait Compared to Professional Learning Standards. *ProQuest LLC*.

Alshammari, A. S. (2014). A socio-cultural investigation of science curriculum reform and implementation in Kuwait: perspectives of teachers, students and curriculum reformers.

Al Shammari, I., Testerman, J., & Halimi, F. (2020). Exploring Teachers' Attitudes towards Teachers' Learning Community in Government Schools in Kuwait. *Journal of Educational and Social Research*, *10*(1), 206-206.

Guskey, T. R. (1995). Professional development in education: In search of the optimal mix. In T. R. Guskey & M. Huberman (Eds.), *Professional Development in Education: New Paradigms and Practices* (pp. 114-131). New York: Teachers College Press

KARTAL, T., & AFACAN, Ö. (2017). Examining Turkish pre-service science teachers' technological pedagogical content knowledge (TPACK) based on demographic variables. *Journal of Turkish Science Education*, *14*(1), 1-22.

Koehler, M. J., & Mishra, P. (2005). What happens when teachers design educational technology? The development of technological pedagogical content knowledge. *Journal of educational computing research*, *32*(2), 131-152.

Lewin, K.M. and Stuart, J.S. (2003). *Researching on teacher education: New perspectives on practice, performance and policy.* Synthesis report of Multi-site Teacher Education Project (MUSTER). Sussex: University of Sussex Institute of Education.

Mishra, P., & Koehler, M. (2006). Technological pedagogical content knowledge: A framework for integrating technology in teacher knowledge. *Teachers College Record, 108*(6), 1017-1054.

Schleicher, A. (2012). Preparing teachers and developing school leaders for the 21st century: Lessons from around the world. OECD publishing.

Singer, F. M., Samihaian, F., Holbrook, J., & Crisan, A. (2014). Developing a competence-based curriculum for the 21st century: The case of Kuwait. *Procedia-Social and behavioral sciences*, *128*, 475-481.

Thomas, T., Herring, M., Redmond, P., & Smaldino, S. (2013). Leading change and innovation in teacher preparation: A blueprint for developing TPACK ready teacher candidates. *TechTrends*, *57*(5), 55-6

Thompson, A., & Mishra, P. (2008). Breaking news: TPCK becomes TPACK! *Journal of Computing in Teacher Education*, *24*(2). 38–64.

World Bank (2005). *Expanding opportunities and building competencies for young people: A new agenda for secondary education. Washington, DC: World Bank.*

The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 122-129
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.179

Enhancing Oral English Communication Ability of Thai EFL Undergraduates via Interactive Reading Comprehension Teaching (IRCT)

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Abstract
This paper reports on the effectiveness of Interactive Reading Comprehension Teaching (IRCT) in improving the oral English communication ability of Prince of Songkla University (PSU) undergraduates. It is based on a pre- and post-test quasi-experimental study employing IRCT, composed of self–study reading assignments and a structured peer-teaching project. The participants who were purposively sampled to partake in the study included 105 second- and third-year undergraduates from various faculties who were enrolled in a functional reading course, of which 46 was assigned to the control group and 49 was treated as the experimental group. One-on-one and group oral assessments were administered to both groups at the end of the course after IRCT implementation. The results showed IRCT had a very positive effect on the oral communication skills of the students in the experimental group, significantly improving their confidence and motivation toward speaking English. The students' opinions from a questionnaire also revealed high speaking improvement, reinforced by evidence from close observations, interviews, and student work samples. IRCT was, therefore recommended as a reading-based approach to improving students' oral English communication.

Keywords: Interactive Reading Comprehension Teaching Methods, Oral English Communication, Self-Study Reading Assignment, Small-Group Peer Teaching Project

1. Introduction

As English has become the leading means of global communication, a good command of the language has undoubtedly become imperative for partaking in any international arena of the fast-changing world and entering a highly competitive workforce. However, despite the Ministry of Education of Thailand enforcing the inclusion of English in every school's curriculum and taking initiatives in promoting effective English Language Teaching (ELT) at every educational level (Punthumasen, 2007), the English proficiency of the majority Thais has often

been infamously ranked low by most global measures. The Education First English Proficiency Index (EF EPI, 2017), for instance, reported that Thailand ranked 53rd out of 80 countries with 49.78 points, and 15th of 20 among Asian countries with Singapore being top-ranked at 66.03. The traditional grammar translation approach adopted by most teachers in Thai schools has left little room for the development of students' oral communication skills (Boonpattanaporn, 2017), demotivating them to learn to speak English (Punthumasen, 2007). Most students were hardly given enough opportunities to use the language in the classroom (Choomthong, 2014). Students also reported lack of interesting English class materials (Prapphal, 2003) and poorly equipped classrooms for effective learning (Wongrak, 2017).

To address some of these ongoing problems and improve the widely adopted teaching approach which focuses primarily on reading and grammar, a more interactive teaching method such as interactive reading comprehension teaching can be added to encourage students to orally communicate the knowledge gained from their reading and translation via individual and group assignments. The beneficial integration of speaking into teaching reading has long been documented (Bright & McGregor,1978; Krashen & Terrell, 2005; Oya, Malano, & Greenwood, 2009; Zhang, 2009; Mart, 2012; Hwang et al., 2016). Students who have acquired large reading vocabulary are inclined to develop more speaking vocabulary for speaking fluency (Laufer, 1997; Oya et al., 2009), and successful orators have always been readers of extensive literature (Bright & McGregor, 1978). McCarthy (1990), Laufer (1997), and Folse (2004) stressed that without words to express a wide range of meaning, L2 communication cannot effectively happen. Vocabulary shortage makes learners stumble when speaking and more reluctant to speak, which can be overcome by encouraging learners to read more (Akbar, 2014). As pointed out in Krashen and Terrell (2005), via reading, learners can not only find words memorably used with force and point, but comprehend subject content better for more successful oral communication.

Therefore, reading teachers should engage their students not only in extensively reading interesting materials appropriate for their levels, but in meaningful activities to verbally communicate what they have read. Through extensive reading, learners advance their ability to guess the meanings of unknown words and phrases from context clues and to structure their sentences, transferable into speaking (Hedge, 1985; Hill, 1979). Learners who spend a lot of time reading and articulating what they have read for others are likely to speak well. L2 teachers are encouraged to develop a teaching method that can not only teach reading, but improve students' oral communication ability at the same time (Davies & Pearse, 2002). This method is referred to in this study as Interactive Reading Comprehension Teaching (IRCT). IRCT is a teaching method that introduces learners to extensive reading and articulating ideas about the reading for sharing with others, and whereby learners are constantly assessed through individual and group oral activities. The purposes of this study are to determine the effectiveness of IRCT in improving oral English communication ability among undergraduate students and to explore their opinions on IRCT with the research questions being outlined below:

1. Can IRCT help improve the oral English communication ability of the undergraduates of PSU? If so, how?
2. What are the students' opinions on IRCT?

2. Method

2.1 Population and Study Sample

The population of this study consisted of second and third-year undergraduate students registered in the reading course *'*Functional Reading *(*890-222*)'* at Prince of Songkla University, Hat Yai. One hundred and five students participated in the study (41 males and 64 females*).* Fifty-six students (20 males and 36 females*)* of one section were selected as the control group, while the other 49 (21 males and 28 females*)* were treated as the experimental group. Their ages were between 20 – 24 years old. The majority of the experimental students were from the Faculty of Management Sciences (45%) and Faculty of Sciences (24%*).* The rest belonged to the Faculty of Engineering (22%) and Natural Resources (8%). Students in the control group were from the Faculty of Management Sciences (48%), Sciences (34%), Engineering (11*%*), Law (3%), Natural Resources (*2*%), and Liberal Arts (*2*%). Only two sections of this course were purposely selected as the participants in this study. The reason that the second and third year undergraduate students studying the Functional English Reading course were chosen was that they had

already gained English skills adequate for handling assessment challenges. The other was to make the Functional Reading course more practical, interesting, and beneficial, better preparing the students for entering the workforce.

2.2 Research Design

The study employed quasi-experimental design with pre-and post-speaking tests. The control group was mainly engaged in reading selected materials and answering questions based on the materials mainly in writing. The control class was teacher-fronted with students doing reading silently while listening to the teacher's lecture and occasionally responding orally to the teacher's oral presentation about the reading lesson. The experimental class was more interactive as students were required to occasionally read aloud, interact with their peers, and respond to the teacher orally. After class, as part of their self-study students in both groups were asked to select two books to read under the teacher's supervision and complete a written summary report assignment. While the students in the control group were required to submit the written summary only, those in the experimental group were asked to also talk about the reading individually with the teacher and to teach others about it.

2.3 Research Instruments

To determine whether and how IRCT can help improve the oral English communication ability of the PSU undergraduates, aside from observations of students' overall in-class performance throughout the semester, individual oral English assessments were administered to the participants in both groups before and after the experiment. The post-test was given to each participant by the end of the 13th week of the semester. Both pre-and post-speaking tests were video-recorded. The scoring criteria comprised grammar, vocabulary, pronunciation, fluency, coherency, managing conversation, and language use. On the scale of 1-5, Level/band 5 denotes excellent performance, level 4 represents good performance, level 3 indicates fair or acceptable performance, level 2 stands for poor or deficient performance and level 1 for very poor or unacceptable performance. Each band/level includes a set of descriptors for the accuracy of the speaking performance assessment.

Aside from individual oral assessments, students in both groups were also asked to submit a written report about their reading of selected literature; however, those in the experimental group were asked to teach young learners about what they had read in consultation with school teachers for two periods. Their group teaching was video-recorded for subsequent assessments by the first author.

To get the students' opinions and comments on IRCT, a questionnaire was used, and semi-structured interviews were conducted with students randomly selected from the experimental group after the post test. Adapted from Saezhong (2005), the questionnaire comprised 10 statements with a 5-point Likert scale ranging from 1 to 5 *(*1 = strongly disagree, 2 = disagree, 3 = uncertain, 4 = agree, and 5 = strongly agree*)*. Internal consistency of the questionnaires was measured with Cronbach's alpha coefficient. The alpha reliability of this instrument was 0.95.

2.4 Data Collection

The data was collected via the following procedures:

Step 1: Pre-test oral English assessment
Every participant from both experimental and control groups took a pre-test during the first two weeks of the semester to determine their speaking ability. The interviewer randomly picked questions from the following categories*:* self-introduction topics such as their family, best friends, hobbies, vacation, weekend activities, life philosophy, and motto; social issues such as poverty and global warming; spoken English improvement; students' career plans, and questions on controversial issues such as city/country life, mercy killing, abortion, and capital punishment. The time allotted for the interview was 5-7 minutes per student to allow to answer at least nine questions. The assessment criteria included grammar, pronunciation, coherence, managing conversation, language use and fluency.

Step 2: IRCT lesson design, implementation and assessment
The IRCT-treated class was constantly engaged in orally responding to questions related to the reading, and required to do self-study reading and to teach others about the reading.

Step 3: Self-study reading and one-on-one assessment
Students were instructed to read at least two English literature books they found most interesting within 12 weeks. The class teacher was notified of their choices before the self-study began. The reading was required for the students in both groups daily using the reading techniques taught in class, along with a written report summary handed to the teacher during the oral assessment. The students were expected to finish reading in seven weeks after which an oral exam was taken. The first author who was the class teacher presided over the oral assessment interview about the reading. The interview began with a simple warm-up and gradually moved to more complex issues requiring critical thinking. Scores were given on the criteria shown in an oral evaluation sheet which includes grammar, vocabulary, coherence, confidence, fluency, and overall understanding.

Step 4: Small group project and group oral assessment
The whole class was split into small groups of five. Each group was asked to read and do research on chosen topics. Only the experimental group was asked to prepare a two-hour lesson plan to teach others about what they have read, wherein members of each group had to equally take part in the teaching process. The students were asked to video record their teaching for subsequent evaluation. Each group was also asked to report and give feedback on their teaching to the course instructor during the submission of the video clips.

Step 5: Post-test oral English assessment
By the end of the 13th week before the final written examination, both groups sat for an oral English post-test with questions based on the reading course textbook through a one-on-one interview with the first author. The results of the oral English pre-test and post-test were compared.

Step 6: Students' opinion survey
The students' reactions and opinion about learning through the IRCT were elicited. A semi-structured interview was conducted after the post-test. Only 10 students from the experimental group were randomly selected for the interview.

Step 7: Students' final written exam
Final written exam scores of the course Functional Reading *(*890-222*)* were obtained and compared to see which of the two groups performed better overall.

2.5 Data Analysis

The data obtained from the different instruments were analyzed and interpreted quantitatively and qualitatively. The paired sample *t*-test was employed to compare the scores from pre-and post-tests within and between groups. Pearson correlation was also used to determine the relationship between IRCT implementation and students' oral English communication ability. The data obtained from the semi-structured interview and the teacher's observations was analyzed and classified according to the types of comments students gave on learning through IRCT.

3. Results

The results were presented according to each research question.

3.1 Impacts of IRCT on Oral English Communication Ability of Students

The pre-and post-test scores showed oral performance improvement in both groups of students even though the experimental group treated with IRCT improved to a higher degree as shown in Table 1.

Table 1*:* Descriptive Statistics – Oral English Communication

		N	*Mean*	*SD*	*SE Mean*	*Min*	*Max*	*Sum*
Control	Pre-test	56	18.91	2.89	.39	13	25	1,059
	Post-test	56	22.57	2.41	.32	17	28	1,264
Experimental	Pre-test	49	19.31	3.94	.56	7	26	946
	Post-test	49	26.61	2.99	.43	18	31	1,304

A paired sample *t*-test was conducted to compare the degree of improvement. The results of the comparison between pre-and post-test scores within the control group, i.e., pre-test ($\bar{X}$ = 18.91, SD = 2.89, N = 56*)* vs. post-test ($\bar{X}$ = 22.57, SD = 2.41, N = 56*)* were significantly different, t (55*)* = 12.40, p < .000, η2 =.74, showing substantial improvement in oral English communication skill. The mean increase was 3.66, with the 95*%* confidence interval for the difference between the means of 3.10 to 4.25. The effect size was large based on Cohen*'*s conventions *(*1988*)*. However, the paired sample *t*-test results of the experimental group were more significantly different, t *(*48*)* = 18.77, p < .000, η2 =.88. The post-test score *($\bar{X}$* = 26.61, *SD* = 2.99, *N* = 49*)* was much higher than the pre-test score *($\bar{X}$* = 19.31, *SD* = 3.94, *N* = 49*)*. The mean increase for the experimental group was 7.31, with the 95*%* confidence interval for the difference between the means of 6.52 to 8.09 as presented in Table 2. The effect size was larger than that of the control group score. The results support the hypothesis that oral English communication performance of students taught through IRCT improved more significantly after the experiment.

Table 2*:* Paired *t*-Test

	Paired Differences					***t***	***df***	**Sig. *(*2-tailed*)***
	Mean	***Std. Deviation***	***Std. Error Mean***	**95% CI of the Difference**				
Pre-test – Post-test				Lower	Upper			
Control	-3.66	2.21	.30	-4.25	-3.10	-12.40	55	.000
Experimental	-7.31	2.73	.39	-8.09	-6.52	-18.77	48	.000

3.2 Relationship between IRCT and Students' Oral English Communication Ability

To confirm the association between IRCTA and students*'* oral English communication ability, the opinions of students regarding the teaching method used were utilized as independent variables and the one-on-one interview post-test score of the students in the experimental group was treated as dependent variables. The results are presented in Table 3.

Table 3: Correlation between IRCTA and Students*'* Oral English Communication Ability

		IRCTA
Oral English communication ability	Pearson Correlation	**.379****
	Sig. *(*2-tailed*)*	.007
	N	49

**. Correlation is significant at the 0.01 level (2-tailed).

Interactive Reading Comprehension teaching methods correlated significantly with students*'* oral English communication ability at the 0.01 level of significance. The experimental students showed a positive attitude toward speaking English after they experienced IRCT. This result supports previous work (Garcia, 2000; Chang et al., 2020; Shakibaei & Keivan, 2014; Yoro, 2007; Zhang, 2009) which has indicated an important relationship between these two variables.

3.3 Students' Perspectives towards IRCT

The survey was administered to determine whether the teaching methods used were an effective integration of speaking into a reading course. Table 4 displays the descriptive statistics of the participants' perspectives toward the methods adopted. On average, the participants showed positive responses in all the 10 items.

Table 4*:* Students*'* Perspectives toward the IRCTA

	N	***Min***	***Max***	***Mean***	***SD***
1. The IRCTA motivate me to speak English.	49	2	5	3.82	.76
2. The IRCTA are interesting for me.	49	2	5	3.96	.87
3. The IRCTA help me develop my English pronunciation.	48	2	5	3.83	.83
4. Reading Comprehension approach improves my English speaking abilities.	49	2	5	3.92	.76
5. The IRCTA help me increase and improve my vocabulary and grammar in English.	49	2	5	3.82	.95
6. The IRCTA help me have fun in and outside the class.	49	2	5	4.06	.85
7. I have more confidence to speak English after I went through the IRCTA.	49	2	5	3.94	.85
8. The IRCTA provide more chance to speak English.	49	2	5	3.90	.82
9. The IRCTA motivate me to think more analytical in speaking English.	49	2	5	3.78	.87
10. The IRCTA help me to speak English more fluently and correctly.	49	2	5	3.88	.83

It should be noted that all measures are based on a 5-point Likert*'*s scale where the lowest score is 1 *(*strongly disagree*)*, and the highest score is 5 *(*strongly agree*)*. The participants strongly agreed that they enjoyed IRCT in and outside class with the highest mean score of 4.06 *(*Item 6*)*. They also concurred that the techniques used were interesting *(*Item 2*),* and helped to improve their confidence in English speaking *(*Items 4 and 7*)*. In addition, the participants*'* positive reactions towards ICRT were evidenced in their interview with the course instructor, suggesting IRCT be integrated into a reading course. Reaffirmed by the teacher*'*s observation, students indeed gradually improved via IRCT especially in their confidence level and oral English communication ability.

4. Discussion

Based on the results attained, the following points relate to students*'* development of oral English communication ability.

Firstly, reading materials outside the main textbook is an effective strategy for improving reading comprehension and developing English communication skills for second and third year general students of PSU as suggested by Arias (2007) and Awais and Ameen (2013). Students were motivated to choose from a wide range of titles, the genre they like, and to read at their own pace and convenience. Students were expected to read thoroughly, making sure to prepare well for the one-on-one oral assessment with the course instructor. This interactive self–study approach greatly enhanced the confidence level and English-speaking abilities of the students, who were, otherwise, very introverted. Hedge (2000) and Harmer (2001) supported this finding as they stated that the success of the communicative approach depends on how well teachers can make their students use the language in meaningful contexts, authentic, and real-life situations. Similarly, Davies and Pearse (2002) state that developing activities to help students really communicate in English is the primary goal of an English course, and teachers are encouraged to help their students to communicate effectively outside the classroom in various contexts.

The small group teaching is even more effective in improving oral communication of second and third year students. Aksaranukroh (1989), Douglas and Myers (2000), Foto and Ellis (1991), Murcia et al (2013), and Remache (2016) suggested that English communication teachers emphasize not only linguistic competence, but also the ability to use the language in real-life situations. Regarding students*'* opinions on IRCT as seen in Table 3, even though the methods were apparently demanding for several students, it seems their shyness decreased and they showed a very positive improvement in speaking ability. Students benefited from the interaction they had in the one-on-one oral interview and small group teaching.

5. Conclusion

The results showed that IRCT was effective in developing undergraduate students' oral English communication skills, even though it might require a great deal of commitment and responsibility on the part of both course instructors and students. The latter have to fulfill several requirements and meet deadlines while the instructors are expected to keep up to date with supervision. However, integrating oral communication into a reading course through IRCT has brought reading to the next level. It is no longer just reading and working on given exercises, learning how to scan and skim or looking for synonyms and phrases, but about learning by doing, preparing oneself and coordinating with others in preparation to face real-life tasks. It is recommended that IRCT be integrated into a reading program at the university level and schools be prepared to accommodate students' needs for quality books. Libraries and self-access learning centers should include a substantial number of supplementary reading materials for students from different disciplines to practice reading for knowledge and pleasure. Further studies can also examine the effects of the proposed IRCT on enhancing reading skills.

6. Educational Implications

6.1 Reading Course Instructors

Teachers responsible for teaching reading courses at a university are advised to include extensive self-study as a mode of reading outside the classroom that is often neglected in foreign language classes. With proper supervision on oral assessment after reading, students will have the opportunity to engage face-to-face with their instructor. This will boost courage and confidence in developing English speaking ability.

6.2 Learners

Students will be challenged by IRCT in a reading course**.** They not only have to read with the help of dictionaries and smartphones to check for word meanings and prepare a summary of the story, but also engage in oral communication with their instructor. The other challenging requirement is to work with others to prepare a topic, read, and create an appropriate plan for real-life teaching in English**.** Such exposure to an authentic situation will compel and enhance their English speaking skills, instill confidence, teamwork, leadership and personal development.

6.3 Reading Curriculum

Supplementary reading materials should be an integral part of any reading curriculum so that students can read at their own pace**.** Curriculum developers on reading may consider IRCT integration if they wish to develop reading habits and equip students with stronger English communication skills for real-life situations.

References

Akbar, F. (2014). The role of reading in improving speaking skill in the context of teaching English as a foreign language. *International Journal of English Language & Translation Studies*, *2*(4), 92-98.

Aksaranukroh, S. (1989). *Teaching language skills and culture*. Bangkok: Chulalongkorn University Press.

Arias, I. (2007). Selecting Reading Materials Wisely. *LETRAS*, *1*(41), 131-151.

Awais, S., & Ameen, P. (2013). The reading preferences of primary school children in Lahore. *Pakistan Journal of Information Management*, 14, 38–43.

Bright, J. A., & McGregor, G. P. (1978). *Teaching English as a second language*. London: Longman.

Boonpattanaporn, P. (2017). Grammar and communicative English language teaching in the Thai educational context. *University of the Thai Chamber of Commerce Journal Humanities and Social Sciences, 37*(2), 152-169. Retrieved from https://so06.tci-thaijo.org/index.php/utccjournalhs/article/view/165589

Chang, Y., Taylor, J., Rastle, K., & Monaghan, P. (2020). The relationships between oral language and reading instruction: Evidence from a computational model of reading. *Cognitive Psychology,* 1-20. Retrieved from

https://www.sciencedirect.com/science/article/pii/S0010028520300657
Choomthong, D. (2014) Preparing Thai students' English for the ASEAN economic community: Some pedagogical implications and trends. *Language Education and Acquisition Research Network (LEARN) Journal, 7*(1), 45-57.
Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*. Hillsdale, NJ Lawrence Erlbaum Associates, Publishers.
Davies, P., & Pearse, E. (2002). *Success in English teaching*. Shanghai: Shanghai Foreign Language Education Press.
Douglas, D., & Myers, R. (2000). Assessing the communication skills of veterinary students: Whose criteria? In *Fairness and validation in language assessment: Selected papers from the 19th Language Testing Research Colloquium,* Orlando, Florida (pp. 60-81). Cambridge: Cambridge University Press.
EF EPI. (2017). *English proficiency index*. Retrieved from https://www.ef.co.th/epi/regions/asia/thailand
EF Education First. (2019). The world's largest ranking of countries and regions by English skills Retrieved from https://www.ef.com/wwen/epi/
Foto, S., & Ellis, R. (1991). Communicating about grammar: A task-based approach. *TESOL Quarterly, 25*(4), 605-628.
Folse, K. S. (2004). Myths about teaching and learning second language vocabulary: What recent research says. *TESL Reporter*, *37*(2), 1-13.
Garcia, G. E. (2000). Bilingual children's reading. In M.L. Kamil, P.B. Mosenthal, P.D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Volume 3) (pp. 813- 834). Mahwah, New Jersey: Lawrence Earlbaum Associates.
Harmer, J. (2001). *The practice of English language teaching*. Harlow: Pearson Education.
Hedge, T. (1985). *Using readers in language teaching*. London: Macmillan Publishers Ltd.
Hedge, T. (2000). *Teaching and Learning in a Language Classroom*. Oxford: Oxford University Press.
Hill, W. R. (1979). *Secondary school reading: Process, program, procedure*. Boston: Allyn and Bacon.
Hwang, W. Y., Shadiev, R., Hsu, J. L., Huang, Y. M., Hsu, G. L., & Lin, Y. C. (2016). Effects of storytelling to facilitate EFL speaking using web-based multimedia system. *Computer Assisted Language Learning*, *29*(2), 215-241.
Krashen, S. D, & Terrel, T. D. (2005). *The natural approach: Language acquisition in the classroom*. Prentice Hall Macmillan: New York.
Laufer, B. (1997). What is in a world that makes it hard to easy: Some intralexical factors that affect the learning of words. In N. Schmitt & M. Maccarthy (Eds.), *Vocabulary: Description, acquisition and pedagogy.* Cambridge: Cambridge University Press.
Mart, C.T. (2012). Developing speaking skills through reading. *International Journal of EnglishLinguistics*, *2*(6), 91-96.
McCarthy, M. (1990). *Vocabulary*. Oxford: Oxford University Press.
Murcia, M. C., Brinton, D. M., & Snow, M. A. (4th ed.). (2013). *Teaching English as second or foreign language*.
New York Boston: Harper Collins Cengage Learning.
Oya, T., Manalo, E., & Greenwood, J. (2009). The influence of language contact and vocabulary knowledge on the speaking performance of Japanese students of English. *The Open Applied Linguistics Journal*, 2, 11-21.
Prapphal, K. (2003). English proficiency of Thai learners and directions of English teaching and learning in Thailand. *Journal of English Language Studies*, *1*(1), 6-12.
Punthumasen, P. (2007). *International program for teacher education: An approach to tackling problems of English education in Thailand*. Retrieved from http://www.worldreform.com/pub/paperies 13dec07.pdf
Remache, A. (2016). Developing students' communicative competence in university English language programs. *International Journal of Arts & Sciences*, Retrieved from https://www.researchgate.net/publication/308898013_DEVELOPING_STUDENTS'_COMMUNICATIVE_COMPETENCE_IN_UNIVERSITY_ENGLISH_LANGUAGE_PROGRAMS
Saezhong. K. (2005). *The effects of participating in oral presentations on the. English speaking abilities of fourth-year English majors* (Master's thesis). Retrieved from http://thesis.swu.ac.th/swuthesis/Tea_Eng_For_Lan(M.A.)/Komet_S.pdf
Shakibaei, G., & Keivan, S. (2014). The correlational analysis between speaking and listening, reading and writing, and reading and speaking mean band IELTS scores achieved by 2011 from the top 41 countries (Academic). *The Iranian EFL Journal, 10*(1), 338-348.
Wongrak, C. (2017). *The role of L1 in the instruction of L2: Perspectives of Thai EFL teachers*. Paper presented at The Asian Conference on Education & International Development: Educating for Change, Nagoya, Japan.
Zhang, Y. (2009). Reading to speak: Integrating oral communication skills. *English Teaching Forum*, 1, 32-34.

The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 130-140
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.180

Mentoring: The Way to Academic Excellence

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Abstract
This study is aimed at exploring the rationale behind academic mentor's success, as mentoring is a developmental process involving capacity-building, knowledge transfer and employee retention in organizations. This paper is a conceptual study conducted with an extensive review of relevant literature on mentoring. The reviewed literature centres on meaning, forms and types of mentoring, qualities of a good mentor, stages and benefits of mentoring, challenges of mentoring, mentoring and academic excellence. This study was anchored on the descriptive mentoring theory by Kram (1985). The study found that regardless of how well a mentor and mentee fit together, either in form or in a positive way, the relationship should be professionally structured as well as considered and respected by both parties. The study also concludes that most successful mentorship usually evolve into friendship with both partners learning and providing support for each other. This paper contributes in the existing literature by examining the rationale for successful mentorship and ways to overcoming mentors challenges. No previous research has illustrated the ways mentorship could lead to academic excellence in Nigerian tertiary institution.

Keywords: Mentorship, Protégé, Kram's theory, Academic Excellence, Mentoring

1. INTRODUCTION

The development of any country is engendered by the effectiveness of its various institutions. Institutions are the social structure in which people cooperate and which influence the behavior of people and the way they live (Hodgson, 2006). Universities as institutions are the highest level of education outfits where students study for degrees or conduct high-level research (Assié-Lumumba, 2005). Raza (2010) described education as a vehicle for conveying truth and feeling, information, passion, understanding and appreciation to human beings and the development of a self-directed society in line with national norms and aspirations to benefit everyone in society. Okoli & Monanu, (2016); and Monanu, Okoli, Ezeliora, & Okeke (2014) opined that educational institutions are the foundation on which many successful countries depend and if better expertise are engaged in individuals

through education there will be positive contribution to the economy. The success or failure of any education is always influenced by the vital role that academics play in the development of the country's human resources to help it achieve competitive economic growth, high employment levels, and technological advances (Chughtai & Zafar, 2006; Idris, Dollard, Coward, & Dormann, 2012). Therefore, many researchers and experts have agreed to present work as a way for people to gain access to expertise, for career developmental purposes and to be more effective by academics (Osezua & Agbalajobi, 2016).

Mentoring is popular at capacity-building, knowledge transfer and employees retention in many organizations especially in the educational sector. It is a link between two people who are often passionate about improving professional goals at the end (Abouraia & Albdour, 2017). Higgins & Kram (2001) strongly believe that the teaching profession and the development of social work affect the lives of mentors and mentees. Mentoring produces many work outcomes in the workplace, such as career development and advancement, promotion, pay, job satisfaction, and participation in this organization. Hansford & Ehrich (2006) also argue that mentoring programs have affected many fortunate professions in business, industry, and education. The main goal of mentoring is to help employees understand the nitty-gritty parts of their jobs well on time in order to facilitate personal, career and professional growth necessary for high professional commitment (Ojeaga & Okolocha, 2019).

The Nigerian academia has faced several challenges in terms of effectiveness and global importance. One of such challenges is incessant student enrollment, thus increasing student enrollment in Nigerian universities on annual basis demand for better competent academia that will deliver qualitative learning, research and services that can rival with its peers in the developed world. Osezua & Agbalajobi (2016), posit that one important avenue through which academic standards can be maintained and sustained is through academic mentoring. The creation of a mentoring system for academics is surely a step in the right direction if instituted in the Nigerian university system. However, previous research reveals that the benefits of mentoring have not been highly recognized by both academics and their institutions and the lack of formal mentoring (Ogboju, 2011; Ugwueze, Ngwoke & Aniodo, 2013) or systemic deficiencies of the administration of universities in terms of absence of mentoring relationship-oriented issues (Anijobi-Idem & Archibong, 2012) may have been adduced to be responsible for poor academic excellence. The implication of this may have resulted in the decline of productivity and poor quality of teaching in the Nigerian universities. There may therefore be a need to embrace mentorship relationships in higher educational institutions. The above can go a long way in reducing the weakness that institutions have in terms of human capacity building to seek the fulfillment of their vision. It is upon the above premise that the study seeks to explore the rationale behind academic mentorship success.

2. REVIEW OF RELATED LITERATURE

Mentors and Nature of Mentoring

The word "mentor" comes from Greek mythology when Odysseus, king of Ithaca, entrusted the care of his son to his friend, Mentor, as a tutor and teacher, a man who could raise his son, Telemachus, as he himself if he were there he would not have fought in the decade of the Trojan War (Carey & Weissman, 2010). Since then, the issue has begun and the practice has become more popular. A mentor is therefore more experienced, wise and trustworthy who provides help and advice to young and inexperienced people over time. The mentor is a real value to the young team. An experienced mentor can save a business from major mistakes and costly mistakes in a few short words (Cull, 2006). American Psychological Association (2006) defined a mentor as an expert who can help develop the function of the mentee. Kram (1985) suggests that a mentor usually has two roles for mentee; work-related function as well as psychosocial function. Work-related function assists the mentor as an adviser to enhance the professional performance and development of service providers whereas psychosocial function places the mentor as an example and support system for the mentee. The relationship with which the person with experience or expertise assist in guiding the inexperienced or unintelligent person is called mentorship and the process needed to be is known as mentoring.

Wright & Smith (2000) defined mentoring as a dynamic, interpersonal relationship between work situations, involving a person with more experience in a particular discipline (mentor) and someone with less experience,

usually a beginner in that discipline (mentee). Johnson (2002) sees university-based mentoring as a personal relationship between two professionals where an experienced professional (usually an adult) or professional role as a leader, model, teacher and sponsor of a graduate student (minor) or scholar. It is also a development process related to the structure of teaching, facilitating, training and counseling, with the aim of disseminating knowledge and encouraging individuals (Renshaw, 2008). Mentoring has been considered as one person's own self-improvement strategy that facilitates the development of the other by sharing knowledge, ideas, learning, skills, values, skills, ideas, proficiencies and professional competence (Klinge, 2015).

Mentoring is a powerful system that helps people develop and add value to their personal and professional abilities regardless of their field of work (Ongek, 2016). In his leadership study, Klasen & Clutter (2002) found that mentoring is very important in aiding young school leaders learn, grow and become more professional. In the environment, mentoring is considered important by many scholars to reduce work pressure and assist reduce conflict that may arise as young academics struggle to get a good job–life, improves performance and stability (Winesfield & Jarret, 2001). Connor & Pokora (2007) emphasized that mentoring is an educational partnership that helps people control their own development, release their energy, and achieve their potential. Megginson (2006) describes mentoring as a gift from one person to another and a necessary change in knowledge, activity, or thinking, or support from senior colleague and with the purpose to support learning rather than provide answers that will add value to the career development of the younger fellow.

Types of Mentorship

There are two basic ways a person can show up at university. They are formal and informal mentoring (Tettey, 2006; Buell, 2004). Murray (2001) argues that in formal mentoring, mentor-mentee relationships are regulated. The administration of the university is responsible for the purpose of selecting and connecting the mentee and its mentor with the aim of helping the mentee grow and develop certain abilities. Formal mentoring is viewed in line with its features as a kind of relationship in which goals of the relationship are well established from the beginning by the organization or institution; whose results are measured; access to mentoring is communicated to all that meet the criteria; both the mentor and mentee interact based on compatibility; training and support are provided in the mentoring process and the mentor, mentee and the organization all benefit directly from the mentoring (Murray, 2001). Wanberg, Welsh & Hezlett (2003) identify six aspects of the formal mentoring process that can make this program more effective: (a) program objectives, (b) selection of participants, (c) compatibility of mentors and mentees, (d) training for mentors and mentees, (e) procedures for meeting time, and (f) a goal-setting process.

Informal mentoring, being the opposite of formal mentoring, does not reflect the purpose of the relationship; does not specify results; relationships can be acquired and counseled and can be alone; the mentor and the mentee choose themselves based on a combination of strong personal emotions that are unpredictable and can last a long time or even a lifetime; and the focus is on mentee where the organization benefits indirectly (Mentor/Mentoring Partnership, 2005). Informal mentoring relationships are dynamic by nature through acceptance, desire, values and interests. In informal mentoring relationships, mentors and mentees choose who they would like to work with (Afolabi, Faleye & Adeola, 2015). It involves a self-motivated mentor making sure that the mentee develops the skills, abilities, values, attitudes, expertise and knowledge needed to be successful, to have a successful career well and donate as much as possible to organizations, communities and countries (Peretomode & Ikoya, 2019).

Ugwueze, Ngwoke & Aniodo (2013) argued that some individuals have lauded the flexibility of the informal mentoring; however, they have also argued that it is less successful in achieving desired outcomes. Tettey (2006), averred that those in support of formal schemes argued in favour of the structured interaction in the relationship as there is clear expectation, set time for meeting, and transmission of organizational culture, as against the uncoordinated and non-committal characteristics of the informal schemes. Irrespective of the direction of the argument, universities can be exposed to both schemes in order to achieve success in academic effectiveness and efficiency especially in addressing the global challenges.

Ugwueze, Ngwoke & Aniodo (2013) emphasized that some people praised the changing nature of informal mentoring; however, they also found it unsuccessful in meeting the requirements. Tettey (2006) averred that legal advocates support social interactions as a clear expectation, set time for meetings, and transfer cultural contexts, as opposed to unrelated and non-affiliated identities of the informal schemes. Despite the direction of the debate, the university can be exposed both initiatives in order to make progress in academic excellence and performance in addressing global issues.

Forms of Mentoring

This study identified the following forms of mentoring to include; (Mentor and Mentoring Partnership, 2005):

1) Traditional mentoring,
2) Group mentoring,
3) Team mentoring,
4) Peer mentoring, and
5) E-mentoring.

1) Traditional mentoring: This includes one-on-one counseling applied to an elder and a relationship with a younger person. They meet often for at least four hours a month for at least a year. The mentor and mentee know the expected time in the relationship and adjust their expectations (Mentor & Mentoring Partnership, 2005).

2) Group mentoring: Group mentoring as the name suggests, usually appears in groups as mentors may wish to choose. It usually involves a team of one or more mentors working with at least two people but not more than thirty-two mentees (Kuperminc & Thomason, 2014). Group mentoring may vary in size, number of mentors and mentee reached (Kuperminc, 2016; Jones, 2016). These programs focused on mentors who interact with a small group of mentee groups and can develop several fruitful relationships at once (Herrera, Vang, & Gale, 2002). Group mentoring differs from other mentoring systems in that it encourages two relationships; mentor-to-mentee and mentee-to-mentee (Kuperminc, 2016). Group mentoring programs are usually available in organized environment such as schools or other youth-serving organizations in the area. As a result, mentees have opportunities to a vast range of adults including teachers, youth workers and other adults willing to serve as educators (Karcher, Kuperminc, Portwood, Sipe & Taylor (2006).

3) Team Mentoring: This includes more than one mentor working with one mentee or a group of mentees. Team mentoring enables mentors to work co-operatively or separately to assist mentees attain development goals (Ayodeji & Adebayo, 2015). Mentor & Mentoring Partnership (2005) stated that this type of mentoring includes many adults (mentors) working in small groups of young people with adult-to-adolescence levels of one to four. The mentor may work with a mentee or group of mentees with the purpose of communicating constantly, disseminating information and ideas. Williams (2000) showed that team mentoring emerges when a leader is a mentor and takes this team through coaching, psychosocial support and role models. A leader who is not always a mentor leads his team to guide each other. In other words, team mentoring is dyadic in that the team focuses on building connections between team leaders and team members as well as between team members.

4) Peer Mentoring: With this type, loving youth develops leadership/teaching relationships as well as learning from youth or skill development programs and serve as a role model (Mentor and Mentoring Partnership, 2005). Young people at least 2 to 3 years older than their mentees and fulfill similar tasks led by adults (Noam, Malti, & Karcher, 2013). This form of mentoring focused on adult youth can serve well as a role model and also as a mentor. Peer education often occurs in schools or community settings, as well as high school youth who are in middle school or elementary school. These programs are well organized and managed, with at least six to eight meetings (Karcher & Berger, 2017). The advantage of peer mentoring is that it seeks to promote its learning and knowledge for behavioral and social change. In addition, young adults can benefit from serving as mentors, where it can help them meet their relationship needs (Smith, 2011).

5) E-mentoring: E-mentoring refers to the practice of using electronic systems, in whole or in part, as the primary means of communication between mentors and mentees (Kaufman, 2017). The main difference between

e-mentoring and other types of mentoring is while the later is based on personal contact with each other, the first is purely electronic. E-mentoring builds relationships by relying on the internet or social media to connect mentees and mentors. Contact conversations can take place via email, chat, web, message boards, or other popular social media platforms among mentees. E-mentoring offers many opportunities that can be useful to others.

Qualities of a Good Mentor

For mentors to achieve their goals they must possess certain key qualities (Peretomode & Ikoya, 2019):

1) Ability and willingness to express clearly their values, skills, knowledge and expertise.
2) Always be ready for each mentoring session.
3) Be ready to demonstrate faith in his mentee's ability and readiness to learn.
4) Should be available, be approachable, flexible, and be a good listener.
5) Be honest, truthful, and straightforward whenever mentee questions.
6) Should provide feedback and practical guidance to the mentee.
7) Always be prepared to follow up to find answers to questions asked by a mentee that he does not know.
8) Be objective and positive with the relationship.
9) There should be plenty of space and no hidden agenda involved in the relationship.
10) He should show be compassionate.
11) Mentees should be honoured whenever possible.
12) He should be willing to leave his comfort zone and dedicate himself to other victories.
13) The mentor will be able to allow the link to focus on the needs of the mentee.

Roles of Mentors in Mentoring Programs

A mentor perform certain responsibilities on two levels, both assisting the mentee in meeting pertinent job roles and aiding them envision and take measures toward their desired career. A mentor combines instruction in professional behaviour and tasks with affective support. Also, a mentor may fulfill all or a combination of these roles. The mentor combines teaching with professional behavior as well as related support. Also, a mentor can complete all tasks or combine them. The mentor:

1) Advocates - provides support, offer exposure and visions within the organization.
2) Acquires resources - provides rigorous readings, avenues, or expertise to the attention of the mentees.
3) Acts as a role model – provides insights on how to "do it" in an organization.
4) Advises - shares organizational and work wisdom, antagonize performance, and make recommendations.
5) Coaches - helps the mentee learn new expertise and perform new activities.
6) Protects - helps a mentee seek new opportunities and challenges within the organization while protecting him or her from unhealthy and "dead" work.
7) Support - listen with empathy, explain unwritten rules, and acknowledge disappointment and victory.

Stages of Mentoring

According to Kram (1988), there are four definable stages of mentoring. There are:

Initiation: This is the stage where mentor and mentee can establish common ground where they get to know one another. This is the stage to build relationship and establish integrity with mentee. Informal meeting can be used to developed strong connections. At this period, mentor may determine the learning needs of mentee. During this time, peer observation can also be carried out. It takes about 6 to 12 months for mentoring relationship to establish.

Cultivation: At this stage, there are frequent interaction opportunities leading to possible mutual development. Relationship is further forged. It is the longest stage in the mentoring program that usually last from 2 to 5 years. During this stage, mentor and mentee can work together to produce projects that can lead to professional development. There can also be a numbers of problems as the relationship is being tested through actual work.

Separation: At this stage, mentee is given autonomy and there will be less frequent meeting with the mentor. At this point, it would be good to share self management strategies with mentee. Unattainable goals and objectives can create disappointment and frustration for mentee when he/she has more autonomy and need to handle things

independently. Have an open idea where mentee can meet mentor on a need basis to provide a good listening ear as well as guidance to guide them back to focus.
Redefinition: During the redefinition stage, both mentor and mentee understand that their relationship may continue but may not be the same as their relationship. If the mentor and mentee are to succeed in terms of separation, the relationship can develop into friendship. Unlike the cultivation stage, part of the relationship does not focus on the development of mentee career. The former mentor can interact with new mentees. Similarly, a former mentor can serve as a mentor to others.

Benefits of Mentoring

Mentoring programs are considered because of the positive impact they can have on the people involved, that is, the mentor, the mentee and the institution. Thus, the following are possible benefits of mentoring (Ekechukwu & Horsfall, 2015; Mentor/Mentoring Partnership, 2005; Gibb, 1999):
For the Mentor:

1. Improved teaching skills
2. Intellectual challenge of working on issues which may take them into unfamiliar territory
3. Mentors receive recognition and incentive for their mentoring skills by the department and the University.
4. Motivation from self development and responsibility
5. Satisfaction at the success of the mentee
6. Reinforce the knowledge in the future practice
7. Opportunities for increased collaboration

For the Mentee:

1. Support and challenge in formulating a clear sense of personal direction
2. Understanding of the formal and informal culture and structures of the institution
3. Collaborative efforts towards meeting global challenges
4. Develops a sharper focus on things that will help him grow professionally
5. A source of knowledge and experience to tap into
6. Learns specific knowledge and skills necessary for personal goals
7. Increased self confidence and motivation

For the Institution:

1. Introduces stronger partnerships, such as intelligent staff relates with new and young people.
2. Increase commitment and productivity in the institution and reduce turnover among employees.
3. Employers use their own staff more than external consultants as internal experts for professional development in their work.
4. Costs associated with mentoring are seldom compared to other types of employee development services.
5. Sharing of knowledge and experiences and best practice as standard working practice
6. Innovation and continuous improvement in the way that employees approach their work
7. More profound academic interaction among colleagues (Collegiality)

Challenges of Mentoring

There is no doubt that mentoring offers wide range of benefits to mentors, mentees, and the institutions but even the foremost mentoring programs with committed participants can face problems. Atkinson & Mitchell (2008) lists some challenges to include; high pressure on working hours, requirements and duties of a mentor, understanding and expectations, position and categories of staff, unwillingness of mentor or mentee to participate in mentoring, as well as culture and work environment. Wright & Wright, (1987) highlighted five setbacks to mentoring that can be applied in higher education: a mentor may lose his or her strengths or emotions, the mentee may be limited to only one person's view, the mentor may leave the organization, the male mentor may want sex from a female mentee, and the mentee may approach the poor mentor.

Long (1997) identified thirteen problems with mentoring. These concerns are, time-consuming for all involved, poor planning for the mentoring system, poor coordination of mentors and mentees, lack of understanding of the

mentoring system, lack of capacity for mentoring to create employment tensions, fewer mentors - mostly women, excessive use of available mentors, lack of access to mentoring for women in small groups, and the development of a mentor's role in unhealthy relationships between mentor and mentee. Others are high vision of a mentoring program, lack of understanding as to whether mentoring is leading to career advancement of the mentee and paucity of fund or cancellation of funding before the program can depict potential benefits.

Ehrich & Hansford (1999) stated some of the barriers affecting mentoring in organizations to include incorrect matching of mentors and mentees, lack of top-down support, creation of false promotional expectations, resentment felt by those not involved in the scheme or the perception of favouritism, gender issues and blurring of role boundaries. Others include leadership and management styles of the organisation, credibility of internal mentors and poor communication skills. Similarly, the other common challenges in mentoring relationships are meeting as scheduled, excessive time and energy commitments, unrealistic expectations, overdependence on the mentor or mentee, unfair manipulation on the part of the mentor or mentee, resentment or jealousy from others, ineffective mentoring pairs**.**

Overcoming Mentoring Challenges

Individuals and institutions can take responsibility and commitment to overcome difficult challenges from the start. Individuals, both mentors and mentees, should consider whether giving them appropriate mentoring is important. If so, steps can be taken to ensure safety. These mentoring challenges can be overcome through:

1) Acknowledge the intentions of the mentoring relationship from the beginning, and write them down.
2) Follow up on recommended program and organization meetings.
3) Set time as a goal, and monitor your progress from time to time. Each mentoring relationship has a process - including its termination to formal mentoring. This does not mean the breakdown of the relationship, but changes in the relationship and frequency.
4) Mentors must keep their pride in check and remind themselves that this relationship is about the mentee, not the mentor. Mentees should remind themselves that it is they who want the experience. They should make their own decisions and remember that their mentors are basically for support and feedback.
5) Protect the mentee from mistakes or principal errors, and also allow the person to learn from his or her experiences and mistakes. Remember that a successful mentoring relationship is one where the mentee will continue and no longer need support. Make sure the mentee is not overly dependent.
6) Education is the best. Mentors and mentees can share information about this program with peers and other important people.
7) Recognize that women and other minorities within the institution face additional barriers to advancement. Have proper education and understanding about the issues and respect their different diversities, experiences, ideas, and goals.

3. THEORETICAL FRAMEWORK

The Descriptive Mentoring theory provided the theoretical framework for this study. The Descriptive Mentoring theory was propounded by Kathy E. Kram in 1985. Kram (1985) stated that mentoring is a social interaction between a mature co-worker (mentor) and a junior professional (mentee) in which the mentor gives instructions, support and feedback to the mentee on career planning and personal development. Kram (1985) stated that a mentor support guides and advises an adult as he or she engages in the best or most important part of the adulthood or career world. Kram, (1985) also observed that a mentoring relationship is a type of workplace relationship that is slightly different for the two types of functions it offers. These are career functions and psychosocial functions. Career functions include support, exposure and vision, teaching, safety, providing critical services, and delivery of professional standards and ethics. Kram (1985) emphasized that career-related functions are those aspects of a mentoring relationship that involves a mentor leading and imparting knowledge to the mentee. Psychosocial functions include role models, acceptance-and-acknowledgement, advice, and friendship. Psychosocial functions are one of those areas of mentoring that supports the mental development of the mentee's capacity and effectiveness.

In this context, the junior academics in the university are the newcomers and experience high levels of confusion, anxiety and difficulty in getting into the academic system. It is hoped that mentoring provide opportunities to assist them in engaging with senior experiencedacademics will help reduce their ambiguity, prepare them for problem-solving as well as promote their knowledge and skills in the world of education. This opportunity prepares them to address the challenges facing communities, leading to prosperity and job development. Social interaction can also help experienced seniors expand their knowledge and skills for future teaching careers. All of these factors can lead to the excellent higher academic requirements for quality academic competition between universities within and outside the country as well as the enormous wealth of gifts for national and international development.

Mentorship and Academic Excellence

Academic excellence is a proven ability to work, produce and /or excel in academic learning. It can be identified by obtaining better scores and higher performance in academics. It is also considered to be the highest development of intellectual capacity and skills and employment for human beings. Academic excellence also hinges on the need and desire for higher levels of education to tackle some technologically demanding professions (Peretomode & Ikoya, 2019; Csufresno.edu, 2020). Higher educational institutions are usually concerned with maximizing academic competencies and skills in order to stay within or ahead of the competition. The kind of talents required to accomplish institutional goals and objectives often demand that academic institutions provide mentoring programs. Therefore, mentorship is a critical ingredient to academic excellence that can be use to improve intellectual capacity of mentees.

Altbach & Salmi (2011) posit that in making a world class research, modern universities are great opportunity for the creative process of scholars to seek new ideas and the spirit of free research and mentorship plays significant role in this regard. Since mentoring is a unique academic enhancing process upon which protégées acquire skills, knowledge, expertise, experience and refined attitudes, it is undoubtedly an effective form of education that add values to personal, intellectual and professional development of the mentee. Mentoring is a valuable process in educational reform for academics (Genser, 1996). It is used by senior academics as a key professional development strategy to enhance teaching (Mtetwa & Thomson, 2000) and academic excellence. Mentoring creates a sense of collegiality (Dantonio, 2001) enables less experienced academics to have the peace of mind, self-discipline, and sharing skills with others. A number of empirical studies (Karanja & Gukingu, 2014; Crisp & Cruz, 2009; Jekielek & Moore, 2002; Thomson & Kelly-Vance, 2001; Campbell & Campbell, 1997) have shown that mentorship has positive and significant effect on academic performance, experience and productivity of mentees and thus enhanced academic excellence.

4. CONCLUSION

Mentoring is a powerful and important tool for career development and academic excellence and should worth the time, money and effort at the various units and departments of the institution. Regardless of how a mentor and mentee(s) are matched, either formally or informally, the relationship should be conducted in a professional manner with consideration and respect for both individuals. It is however necessary that both mentor and mentee(s) must exhibit mutual acceptance and this is necessary to command the needed respect, especially if it is formally matched. The above notwithstanding, grabbing should not be encouraged, situations where senior academics are completely overlooked by junior ones and are not given the opportunity to have access to mentees. Mentorship as developmental process which involves training and counseling, aimed at sharing knowledge and encouraging individual development and academic excellence and, older academics should be recognized as having these in richer reserves, unless of course the contrary has been proven in particular cases.

Most successful mentorships often develop into friendships with both parties learn and provide support to the other. This stems from the initial understanding on which the relationship was founded and built. The benefits and usefulness of mentorship in leading to academic excellence cannot be over-emphasized and it should therefore be encouraged and embedded as part of the culture of higher educational institutions.

References

Abouraia, M.K; & Albdour, L.R.M. (2017). Determinants of Mentoring and its Significance in Career Success: A Brief Literature Review. *International Journal of Human Resource Studies*, 7, (4): 106-120.

Afolabi, E.R.I., Faleye, B.A. & Adeola, A.M (2015). Mentoring among Academic Staff of Obafemi Awolowo University, Ile-Ife, Nigeria.*Journal of Education and Human Development*. 4(2): 159-167. DOI: 10.15640/jehd.v4n2a19.

Altbach, P.G. & Salmi, J. (eds) (2011). *The Road to Academic Excellence: The making of World-Class Research Universities*. Washington, D.C.: The World Bank.

American Psychological Association. (APA) (2006). Introduction to Mentoring: A Guide for Mentors and Mentees. *American Psychologist*, 1-18.

Anijobi-Idem, F. & Archibong, I.A. (2012). Adjustment challenges of new academic staff in Nigerian universities: A case study of university of Calabar. *Journal of Education and Practice*, 3(9), 69-75.

Assie-Lumumba, N. (2005). *Higher Education in Africa: Crises, Reforms and Transformation*. Senegal: Council for the Development of Social Science Research in Africa (CODSERIA).

Atkinson, M., & Mitchell, H. (2008). *Mentoring and Coaching for Professionals: A Study of the Research Evidence*. Slough: National Foundation for Educational Research.

Ayodeji I.O. & Adebayo L.F. (2015). Role of Mentoring in Business Development in Nigeria. *Global Journal of Human Resource Management*, 3(3): 17-38.

Buell, C. (2004). Models of Mentoring in Communication. *Journal of Communication Education*, 53(1), 56-73. https://doi.org/10.1080/0363452032000135779

Campbell, T.A., & Campbell, D.E. (1997). Faculty/student mentor program: effects on academic performance and retention. *Research in Higher Education*, 38(6), 727-742. http://dx.doi.org/10.1023/A:1024911904627

Carrey, E.C. & Weissman, D.E. (2010). Understanding and finding mentorship: a review for junior faculty. *Journal of Palliative Medicine*. 13(11):1373-9. doi: 10.1089/jpm.2010.0091

Chughtai, A., & Zafar, S. (2006). Antecedents and Consequences of Organizational Commitment among Pakistani University Teachers. *Applied H.R.M Research*, 11 (1), 39-64.

Connor, M., & Pokora, J. (2007). *Coaching and mentoring at work: Developing effective practice.* Berkshire, United Kingdom: Maidenhead Open University Press.

Crisp, G., & Cruz, I. (2009). Mentoring college students: A critical review of the literature between 1990 and 2007. *Research in Higher Education*, 50(6), 525-545. doi:10.1007/s11162-009-9130-2

Cull, J. (2006). Mentoring Young Entrepreneurs: What Leads to Success? *International Journal of Evidence Based Coaching and Mentoring*. 4(2): 8-18.

Dantonio, M. (2001). *Collegial coaching: Inquiry into the teaching self*. Bloomington, IN: Phi Delta Kappa.

Ehrich, L.C. & Hansford, B. (1999). Mentoring: Pros and cons for HRM. *Asia Pacific Journal of Human Resources,* 37(3), 92-107. https://doi.org/10.1177/103841119903700307.

Ekechukwu, R.O. & Horsfall, M.N. (2015). Academic Mentoring In Higher Education: A Strategy to Quality Assurance in Teacher Education in Nigeria. *European Journal of Research and Reflection in Educational Sciences*, 3(2): 37 – 45.

Genser, T. (1996). Preparing mentors of beginning teachers: An overview for staff developers. *Journal of Staff Development*, 17(4), 8-11

Gibb, S. (1999). The usefulness of theory: a case study in evaluating formal mentoring schemes. *Human Relations*, 52(8), 1055-1075.

Hay, J (1995). *Transformational Mentoring*. New York Irwin Mc-Graw Hill Book Company.

Herrera, C., Vang, Z., & Gale, L.Y. (2002). *Group Mentoring: A Study of Mentoring Groups in Three Programs.* Philadelphia,: Public/Private Ventures.

Higgins, M.C. & Kram, K.E. (2001). Reconceptualizing mentoring at work: A developmental network perspective. *Academy of Management Review*, 26(2), 264-288.

Hodgson G.M. (2006). What Are Institutions? *Journal of Economic Issues*; 40: (1).

Idris, M.A., Dollard, M.F., Coward, J., & Dormann, C. (2012). Psychosocial safety climate: Conceptual distinctiveness and effect on job demands and worker psychological health. *Safety Science, 50*(1), 19-28.

Jekielek, S.M & Moore, K.A. (2002). *Mentoring: A promising strategy for Youth Development.* Child Trends. Retrieved from http://www.childtrends.org. Accessed 18th March 2020.

Johnson, B.W. (2002). The international mentor: Strategies and Guidelines for the Practice of mentoring. *Professional Psychology: Research and Practice*, 33(1), 88-96.

Jones, K.R. (2016). *Group mentoring*. 4-H Youth Development Publications. Retrieved on 7th April, 2020, from the web: https://uknowledge.uky.edu/cgi/viewcontent.cgi?article=1005&context=ky4h_reports.

Karanja, B.W. & Gukingu, J.M. (2014). Effect of mentorship programmes on the performance of students in secondary schools in Mbooni East District, Makueni Country – Kenya. *Meditarranean Journal of Social Sciences*. 5(5), 167-175.

Karcher, M.J., Kuperminc, G.P., Portwood, S.G., Sipe, C.L., & Taylor, A.S. (2006). Mentoring programs: A framework to inform program development, research, and evaluation. *Journal of Community Psychology* 34(6): 709–725.

Karcher, M.J., & Berger, J.R.M. (2017). *One-to-one cross-age peer mentoring*. Retrievedon 7th April 2020, from the web: https://nationalmentoringresourcecenter.org/index.php/what-works-in-mentoring/model-and-population-reviews.html?layout=editandid=301.

Kaufman, M. (2017). *E-mentoring*. Retrieved 7th April 2020, from web: https://nationalmentoringresourcecenter.org/index.php/what-works-in-mentoring/model-and-population-reviews.html?layout=editandid=323

Klasen, N. & Clutter, D. (2002). *Implementing Mentoring Schemes*. A Practical Guide to Successful Programs. Oxford: Butterworth, Heinemann.

Klinge, M.C (2015). A conceptual framework for mentoring in a learning organization. *Adult Learning journals*. Sagepub.com. https://doi.org/10.1177/10.1177/104515

Kram, K.E. (1988). *Mentoring at work: Developmental relationships in organizational life*. University Press of America.

Kram, K.E (1985). "*Mentoring at Work*" Glenview, Scott Freeman.

Kuperminc, G.P. (2016). *Group mentoring*. Retrieved on 6th April 2020, from the web:https://nationalmentoringresourcecenter.org/index.php/what-works-in-mentoring/model-and-population-reviews.html?id=121.

Kuperminc, G.P., & Thomason, J.D. (2014). *Group mentoring*. In Handbook of Youth Mentoring, edited by D. L. DuBois and M. J. Karcher. LosAngeles, CA: Sage, pp. 273-289.

Long, J. (1997). The dark side of mentoring. *Australian Educational Research*, 24(2): 115-83.

Megginson, D. (2006). "Mentoring in Action: A Practical Guide (2nd ed.)", *Human Resource Management International Digest*, 14(7). https://doi.org/10.1108/hrmid.2006.04414gae.002.

Mentor/Mentoring Partnership (2005). *How to build a successful mentoring programme using the elements of effective practice*. Retrieved on 23th February, 2020 from www.mentoring.org.

Monanu Oge .G, Okoli, Ifeanyi .E, Ezeliora Martins & Okeke Patrick .A. (2014). Organizational Justice and Citizenship Behaviour among Academic Staff of Selected Private Universities in Southeast Nigeria. *Journal of Economics and Sustainable Development*, 5 (21): 12-23.

Mtewa, D.J. & Thomson, J.J. (2000). The dilemma of mentoring in subject teaching: Implication for teacher preparation in Zimbabwe. *Journal of In-service Education*, 26 (1), 139-152.

Murray, M. (1991). *Beyond the myths and magic of mentoring: How to facilitate an effective mentoring program*. San Francisco, CA: Josssy-Bass.

Noam, G.G., Malti, T., & Karcher, M.J. (2013). Mentoring relationships in developmental perspective. *Handbook of Youth Mentoring*: 99-115.

Ogboju, (2011). Gender inequality in academia: Evidences from Nigeria. *Contemporary issues in Educational Research*, 4(9), 1-8.

Ojeaga I.J. & Okolocha C.C., (2019). Influence of Mentoring On Professional Commitment of Business Educators in Tertiary Institutions in Edo and Delta States, Nigeria. *International Journal of Education, Learning and Development*. 7(12): 11-23.

Okoli, I.E. & Monanu, Oge .G. (2016). An Exploratory Study of Job Insecurity as a Correlate of Employee Affective Commitment. *International Journal of Research in IT, Management and Engineering,* 6 (10): 1-6.

Ongek M. (2016). Mentoring as a Process of Developing Effective School Leaders in the 21st Century. *International Journal of Humanities & Social Science Studies* 2(6): 331-337.

Osezua O.C, & Agbalajobi D.T. (2016). A qualitative study of gender issues associated with academic mentoring in a Nigerian university. *Journal of Educational Research and Practice*. 6(1):119–14.

Peretomode V.F. & Ikoya P. (2019). Mentorship: A Strategic Technique for Achieving Excellence, Manpower Development and Nation Building. *Mediterranean Journal of Social Sciences,*10 (2): 17 – 24, Doi: 10.2478/mjss-2019-0019.

Raza, S.A. (2010). Impact of Organizational Climate on Performance of College Teachers in Punjab, *Journal of College Teaching & Learning*, 7 (10).

Renshaw, P. (2008). *Reflect: Creative partnerships national co-mentoring programme*. Executive Summary. Gateshead: The Sage Gateshead.

Smith, L.H. (2011). Cross-age peer mentoring approach to impact the health outcomes of children and families. *Journal for Specialists in Pediatric Nursing* 16: 220–225.

Tettey, W.J. (2006). *Staff retention in African universities: Elements of a sustainable strategy*. Washington DC: World Bank.

Thomson, L & Kelly-Vance (2001). The impact of mentoring on the academic achievement of at risk youth – children. *Children and Youth Services Review*. 23, (3), 227-242.

Ugweze, F.C., Ngwoke, O.R., & Aniodo, D.A. (2013). Mentoring the Junior Physical Education Academics in Nigerian Universities in the Face of Emerging Global Challenges. *Bassey Andah Journal*, 6: 130 - 145.

Wanberg, C.R., Welsh, E.T., & Hezlett, S.A. (2003). Mentoring Research: A Review and Dynamic Process Model: In *Research in Personnel and Human Resources Management*. 22: 39-124. Bingley: Emerald Group Publishing Limited. http://dx.doi.org/10.1016/s0742-7301

Williams, E.A. (2000). *Team mentoring: New directions for research on employee development in organizations*. Paper Presented at the Academy of Management Meeting, Toronto, Canada.

Winesfield, A.H., & Jarret, R. (2001). Occupational stress in university staff. *International Journal of Stress Management*, 8, 285–298.

Wright, C.A., & Wright, S.D. (1987). The Role of Mentors in the Career Development of Young Professionals. *Family Relations*, 36(2): 204-208.

Wright, S.C. & Smith, D. E. (2000). A case for formalizing mentoring. *Quest*, 52(2), 200-213.

Zachary, L.J. (2011). *The Mentor's guide: Facilitating effective learning relationship*, 2nd edition, John Wiley & Sons Inc.

ASIAN INSTITUTE OF RESEARCH
Connecting Scholars Worldwide

The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 141-150
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.181

Entry Grades and the Academic Performance of University Students: A Review of Literature

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Abstract
Universities world over mostly base their decisions to admit their new students on the applicant's pre-university academic results. However, there is yet no concrete evidence that the students' pre-university academic accolades determine their performances at university level. In this article, we explored the findings of earlier studies that examined the relationships between entry grades and the academic performance of university students. The study was undertaken to collate the literature on the relationships between the students' entry grades and their university academic performance in order to validate earlier assertions, if any, as well as to identify opportunities for further research in this field. During the study, we carried out a systematic review of 59 articles that we drew from different online electronic databases including, among others, the Free Scientific Publication, the Worldwide Science.org, and the Directory of Open Access Journals (DOAJ). The majority of these reviewed studies were drawn from America and Europe. Only a few of them were conducted in Asia, Latin America and Africa. Of the 59 reviewed articles, only 53 of them met our inclusion criteria and our key findings showed, among others, that out of the 53 reviewed articles, 26, 4 and 13 of them revealed the existence of positive, negative, and mixed correlations respectively between the entry grades and the academic performance of university students. The remaining 10 articles, however, did not reveal any significant correlations between the two variables; instead, they alluded to the existence of difference in these relationships between male and female students; thus, suggesting for the need for affirmative action schemes. Overall, the study revealed that there is yet no consensus over whether pre-university academic performances of students predict their performances at university level; thus, indicating the need for further research in this field.

Keywords: Entry Grades, Admission, Cumulative Grade Point Average, Academic Performance, University

1. Introduction

Globally, entry to higher education institutions - particularly universities - is predominantly based on prior attainment of good grades in pre-university educational institutions (Roşeanu & Drugaş, 2011; Mercer & Puddey, 2011; Lambe & Bristow, 2011; Kutty, Lee & Young, 2012; Sandow et al., 2002; Vidal Rodeiro & Zanini, 2015; Shehry & Youssif, 2017; Wikström & Wikström, 2017). As a result, candidates admitted to the university in

particular must have attained certain minimum requirements for specific academic programmes, but should have also favourably ranked among the applicants since everyone is admitted on the basis of his/her grades at pre-university institutions (Wambugu & Emeke, 2013; Aidoo-Buameh & Ayagre, 2013; Nshemereirwe, 2014; Chathuranga, 2016). In Uganda for instance, the minimum direct entry requirements for admission to a bachelor's degree programme are: (i) Uganda Certificate of Education (UCE); and (ii) at least two principal passes at Uganda Advanced Certificate of Education (UACE) obtained at the same sitting or its equivalent (Uganda Government, 2001). According to Richardson, Abraham and Bond (2012), universities often base their students' admission on pre-university academic performance because they strongly believe that it will determine how the students will academically perform while at the institution. Unfortunately, even though many countries have routinely used such an admission criterion to admit their students to universities, its use as the primary criterion for admission to undergraduate programmes has been a subject of criticism for many reasons. First, there is lack of sufficient understanding of its effectiveness in determining student academic performance while at university level (Danilowicz-Gösele et al., 2017); that is, not everyone agrees that a good pre-university grade for a student will automatically result into a better academic performance while at university. Second, many other scholars have reportedly advanced several other factors that affect student academic performance while at university other than their pre-university grades. Kyoshaba (2009) and Aspelmeier et al. (2012) for example reported that the academic performance of a student at university may be influenced by several different factors including the parents' educational background, family size, type of high school attended, and the socio-economic status of the student. Nonetheless, according to Richardson, Abraham, and Bond (2012), the use of high school grade still stands out as a strong predictor of intellectual ability of students at higher educational institutions - although the evidence for this is generally scattered in literature. This implies that there is a need to collate such information in order to provide opportunity for evidence-based university educational planning as well as to guide the admission of students to both public and private universities. Additionally, collating such information would help to identify whether there are gaps that call for further research in this field. The current situation in Uganda points to admission of university students basing on the minimum entry requirements as partly stated above, but there are still gaps in relating those entry grades of students with their university academic performance; thus, the need for this kind of investigation.

1.1. Research Questions

In this study, we sought to answer the following questions: (1) What relationships exist between entry grades and the academic performance of university undergraduate students; and (ii) Do these relationships differ between male and female students?

2. Theoretical Framework

This study was guided by the Input-Transformation-Output (ITO) model, which was initiated in a factory setting illustrating the role of operation in creating and delivering goods and services in an organisation (Henri, 2004). According to Melan (2002), the ITO model represents three components of operations: the input, transformation processes, and outputs. In this case, inputs represent entry grades of students; transformation processes represent the experiences students undergo while at the university including the teaching and learning practices, resources they are exposed to, and the type and quality of interactions students have with their lecturers, while output in this study represents the academic performance of the students. Finally, environment represents the broad university system where all these activities take place right from admission of students to their graduation when they exit out of the university with a given cumulative grade points average (CGPA) and various classes of diplomas and degrees. According to Shachar and Neumann (2010), things like infrastructural facilities, human, financial and information resources that are fed into the education system serve as inputs which are meant to shape or affect the outputs of the transformation process. The ITO model is illustrated in Figure 1 as a functional graph that identifies the inputs, outputs, and processing tasks required to transform inputs into outputs.

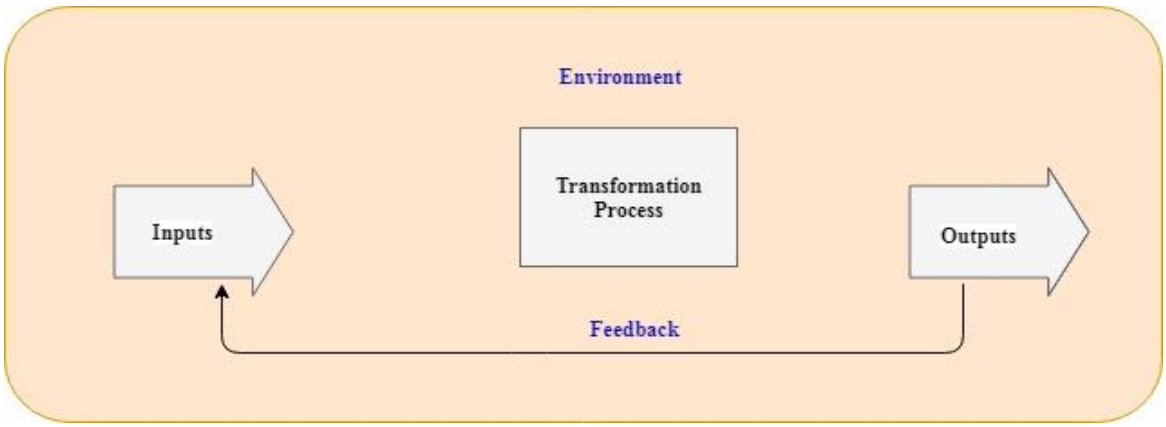

Figure 1: The input-transformation-output model

Source URL. http://www.open.edu/openlearn/money-management/management/leadership-and-management/understanding-operations-management/content-section-0

In the context of what is presented in Figure 1 and in congruence with Sahney and Thakker's (2016) viewpoint, entry grades of admitted students in the above model represent inputs whereas exit academic performance represents the outputs. Therefore, as shown in the ITO model, it is believed that better quality inputs (in terms of quality of students) will be transformed into better results in terms of learning outputs and achievements of students (Abdullah & Mirza, 2018); that is, if the university admits students with good entry grades, they will be taught and easily transformed into good academic performers who will exit the institution with high Cumulative Grade Point Averages (CGPAs).

3. Methodology

During the study, we systematically conducted an integrative literature search and a meta-analysis to assess the correlation between entry grades and the academic performance of students at university. We searched five main online databases, namely: Free Scientific Publication (www.freefullpdf.com), Worldwide Science.org (https://worldwidescience.org), Directory of Open Access journals (DOAJ) (https://doaj.org/), BookSC (http://booksc.org), and Login.Research4life.org (http://login.research4life.org). Our choice of these search engines was dictated by our earlier search, which had shown that there were several databases with relevant articles that we could access through these engines. We specifically searched studies published between 2000 and 2019 using the following string of search terms: admission OR grades performance and higher education* OR admission grades OR academic performance* OR entry grades to universities and academic performance* OR gender and academic performance*. However, as Peres (2017) would advise, it was not possible for us to analyse all the works published in this area within the prescribed time period; therefore, we had to apply different mechanisms of inclusion and exclusion of the articles collected from these databases in order to remain with a manageable number of articles to analyse. Figure 2 illustrates how we conducted the search for the different articles in order to arrive at the number we finally studied.

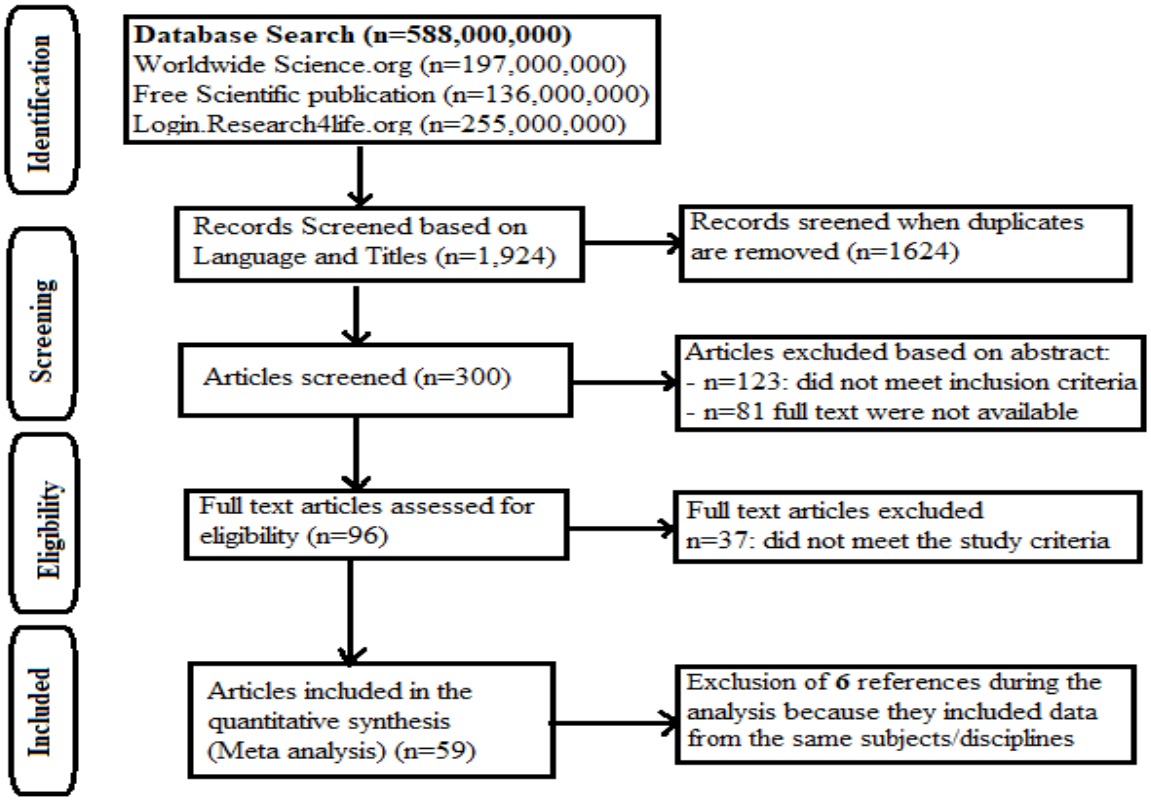

Figure 2: Database search for reviewed articles

While performing the article search as illustrated in Figure 2, we had to use evidence filters, for examples, language filters helped us to select only the articles written in English (the language well known by the researchers). The use of filters enabled us to identify only academic journals articles with online article availability, and while temporal filters guided us on how to get only publications done within the stipulated study period (2000 to 2019). This resulted in a list of 59 references, which were further filtered basing on the title of the study to get the most appropriate literature to review. After further analysis, only 53 out of the 59 articles eventually met our inclusion criteria and they were the only ones that finally contributed to our meta-analysis.

4. Results and Discussion

The 53 articles we analysed were distributed across five locations and in 25 countries. Generally, 26 of the articles reviewed reported the existence of significant relationships between entry grades and university academic performance, four reflected significant negative relationships, 13 had mixed correlations and 10 reported on the difference in the relationships between entry grades and the academic performance of university students based on gender.

4.1. Correlations between Entry Grades and Academic Performance

Several scholars have already looked at the correlation between entry grades and the academic performance of university students. However, the findings of these studies have never been conclusive because the researchers have always reported diverse; and sometimes, contradictory findings. This explains why universities across the United States of America (USA) continue to study admission criteria in order to improve their selection processes and determine how best to provide the support needed for the students (Stuenkel, 2006). According to Roşeanu and Drugaş (2011) and Zwick (2012), standardized admissions tests such as scholastic aptitude/assessment tests (SAT) administered in many institutions in USA were originally developed to identify candidates who would perform better in college as well as future career. In fact, several researchers such as McKenzie and Schweitzer (2001),Wamala (2013), Kurlaender, Kramer and Jackson (2018), Abdullah and Mirza (2018), Ferrão, and

Almeida (2019), and Myburgh (2019) identified academic performance at pre-university levels as the most significant predictor of university performance. They argued that a student who enters university with better grades is most likely to perform academically better than his/her counterpart who has not scored good grades in pre-university examinations. Several other scholars shared this view. Chathuranga (2016) and Hodara and Lewis (2017) for instance opined that high school grade point average was consistently predictive of university performance among recent high school graduates regardless of whether they were from rural or urban locations. This particular finding by Hodara and Lewis, however, contradicted that of other studies, which had reported that the correlation between entry grades and the academic performance in university differed between students of urban and rural high schools. In another study by Geiser and Santelices (2007), it was found out that high school results are consistently the best predictor not only of freshman grades in college, but predictive validity studies of four-year college outcomes as well. This finding was corroborated by the findings of Birch and Rienties (2014) as well as Vidal Rodeiro and Zanini (2015) which indicated that 'A' grades at A-level school increased the probability of attaining good university outcomes - a notion that was supported by Kurlaender, Kramer and Jackson (2018) - but had earlier on been alluded to by Saupe and Eimers (2010). Indeed, Kurlaender et al. pointed out that the primary predictors of college performance are high school grade point averages (HSGPA) which are stronger predictors than standardized test scores. This use of secondary school grades as predictors for college GPA is based on a simple philosophy which states that the best predictor of future behaviour is past behaviour (Roşeanu & Drugaş, 2011; Zwick, 2012; Shehry & Youssif, 2017). Unfortunately, different stakeholders - including university professors as well as education policy-makers - who have come to realize that this assertion is not necessarily true are now challenging the assertion that there is always a significant positive correlation between entry grades and the academic performance of university students. This scenario calls for further studies on this subject; thus, the need for the current research.

Meanwhile, some of the studies that produced results with significant positive correlations between entry grades and the academic performance of university students were focused on specific subjects or courses offered at either high school or university. For example, according to Eiselen, Jonck and Strauss (2007), passing mathematics in the final high school year in South Africa is an admission requirement for undergraduate students in science, engineering and technology (SET) and a predictive validity for good performance while at university. This view was supported by Wamala, Maswere and Mwanga (2013) who discovered that students' CGPA increases with their A-level mathematics scores; that is, the competence in A-level mathematics predicts success in the SET programmes while at university. This conclusion was grounded on the idea that mathematics language proficiency play a critical role in terms of performance in mathematics at tertiary level (Seelen, 2013; Niessen, Meijer & Tendeiro, 2016). This equally explains why scholars like Bush (2012) and Wambugu and Emeke (2013) opined that education institutions admit students based on their entry qualifications because they believe that such students would perform better while at school. These authors actually reiterate that given that learning is a cumulative process, it is often assumed that a student admitted with higher entry qualification is easier to be prepared to perform well in any course rather than one admitted with lower qualification. This assertion supports Kyoshaba's (2009) argument, which posits that there is always a significant positive relationship between admission points and the academic performance of university students.

Nonetheless, not all scholars agree with the assertion that there is a significant positive correlation between entry grades and the academic performance of students at university. According to Opoko, Alagbe, Aderonmu, Ezema and Oluwatayo (2014) who compared the results of direct entry students, unified tertiary matriculation examination students and remedial students at Covenant University in Nigeria, there was no significant difference between the cumulative grade point averages of the three groups of students. This was not any different with the work of Emaikwu (2012 who also reported that there is no significant statistical difference in the mean academic achievement of students who were admitted into the university through unified tertiary matriculation examination (UTME), remedial programme and direct entry. Therefore, students did not differ significantly in their academic achievement based on the mode of admission into the university or even their entry grades. However, these findings were contradicted by the work of Wamala, Kizito and Kakumba (2012) which revealed that the Graduate Management Admission Test (GMAT) has proven to be a good predictor of academic performance of students admitted to Makerere University for Master of Business Administration (MBA) programme in the 2011 and 2012 enrolment cohorts. Hence, the correlation between the performances of MBA students after passing the GMAT

proved to be positive. However, this Wamala et al.'s study was a case of admission on a master degree programme - unlike the current study that focused on the review of literature on the correlations between undergraduate students' entry grades and their exit academic performance at university.

On the other hand, several other scholars who have investigated the relationship between entry grades and the academic performance of university students have also reported the existence of a no significant correlations between the two variables. In a study by Salahdeen and Murtala (2005), for instance, about the relationship between admission grades and the performance of students at Lagos State University College of Medicine in Nigeria, the two researchers discovered that there was no significant correlation between the Senior Secondary School Certificate Examination (SSCE) results and the Joint Admissions and Matriculation Board organised Universities Matriculation Examination (JAMB-UME) scores. Besides, they also found no significant correlation between JAMB scores and the students' performance at pre-clinical science school. This finding was also similar with that Mlambo (2011) who conducted a survey study on a random sample of 66 registered students at the University of the West Indies and discovered that entry qualifications did not cause any significant variation in the academic performance of the students. In yet another study by Koretz, Yu, Mbekeani, Langi, Dhaliwal and Braslow (2016), it was reported that both college admissions and high school tests in mathematics and English had no significant effects on freshman grade point averages at college. These findings contradicted the earlier assertion that students who perform well academically at high school, would end up performing well at university. Nonetheless, the debate about whether there is a strong relationship between entry grades and the academic performance of students in university still rages on; thus, the need for this and further research.

In other circumstances, some researchers have reported the existence of both positive and negative correlations between entry grades to universities and student academic performance. These signified the existence of mixed correlations between the entry grades of university students and their academic performance. According to Kalowole, Orgini and Fayomi (2011), for instance, cognitive entry points in selected Nigerian universities are weak predictors of students' academic performance in Chemistry. The same study also revealed that all the cognitive entry points are poorly related to students' academic performance in chemistry and not even related to university performance in Physics. However, many of these studies were limited to only one or two programmes of study, and no effort to control for overall college performance (Green & Vignoles, 2012). In addition, the use of A-level achievement by higher education institutions as the primary criterion for admission to undergraduate degree programs has been subject to criticism and has been shown to vary substantially across faculties (Danilowicz-Gösele et al., 2017). Indeed, Danilowicz-Gösele et al. stated that in some fields of study, the probability of those with high entry grade graduating was rather low, while in others, weaker students had a greater chance of graduating. This explains why a scholar like Stegers-Jager (2018) advocated for weighting of academic as well as non-academic instruments when considering students for admission in universities. He opined that considering the combination of the two during admission would fit both the needs of validity and diversity at tertiary level of education.

In a two-nation study by Roşeanu and Drugaş (2011), it was discovered that the scholastic assessment test (SAT) in the United States and the baccalaureate examination or the college admission examinations in Romania which were originally seen as reliable indicators of academic achievement did not prove the same in all college results. This explains why Geiser and Santelices (2007) contended that the earlier belief was just a misperception. However, earlier studies as those ones reported above had already shown the fact that high school GPA was consistently the best indicator for first-year College students. The predictive weight associated with high school GPA increases after the first year, making this variable a good indicator for long-term college outcomes like graduation. Besides, in a study done by Lasselle, McDougall-Bagnall, and Smith (2014), there was an indication that students with three 'A' grades at A' Level from schools performing below the national average are more likely to graduate with a First or Upper Second-class degree than those with the same qualifications from an above-average school.

In addition, according to Garton, Dyer and King (2000), most criteria used for college admission of students are good predictors of academic performance but has limited power and value as a predictor of student retention and consistent performance. Bush (2012) meanwhile indicated that entry to higher education in the United Kingdom

(UK) was predominantly based on prior attainment of General Certificate of Education (GCE) and advanced level (A' Level) courses. However, he noted a dissonance between independent school and state-educated students' performance before and post-admission. In fact, he observed that independent school students took longer to complete their studies, and their superior performance prior to admission was not seen at the point of graduation. Wright and Bradley (2010) on the other hand opined that United Kingdom Clinical Aptitude Test (UKCAT) that was used for admitting medical students could only offer better prediction for examinations in first year than for those in second year, indicating that the predictive ability of the entry grades seems to decline over time. But while analysing the performance of students at undergraduate levels, Aidoo-Buameh and Ayagre (2013) discovered that both positive and negative relationships exist between pre-university and university academic performance. Their study revealed that there was a significant relationship between core mathematics and accounting at pre-university level and performance of undergraduate accounting students' performance, but no significant relationship was found between pre-university English and their university-level performance. According to Mutiso and Muthama (2019), academic performance of first-year university students is determined by the category of primary school attended and the university course taken by the students. This, therefore, does not give determinant factor to only entry grades but other factors as well.

4.2. Relationships between Entry Grades and Academic Performance of University Male and Female Students

Different scholars have investigated the linkage between gender, entry grades and the academic performance of students at university level in different countries. Some of these studies have recommended for the use of affirmative action schemes for admitting students in public universities. According to Onsongo (2009) and Ahikire (2013), for instance, affirmative action in university admission means giving priority to disadvantaged groups without ignoring the minimum entry requirements in the institutions. Such priorities can be given based on factors like gender, disability or any other minority groups. According to Ahikire (2013), in Uganda, the consideration of 1.5 extra points awarded to female students during admission started at Makerere University in 1990 and as a result, the admission of female students in the University steadily began to increase. In fact, according to Kwesiga and Ahikire (2006), the introduction of this scheme resulted into an increase in the percentage of female students enrolled at Makerere University from 23.9% in 1989/1990 to 45.8% in 2003/2004. However, the female students who were admitted on the affirmative action scheme at Makerere University in Uganda continued to perform well academically just like their male counterparts. For example in the same study of 2006, Kwesiga and Ahikire reported that in the 1999/2000 academic year, among the best 20 third-year Bachelor of Science with education programme students, 13 were female students who had been admitted on affirmative action scheme. This finding was in tandem with the works of many other scholars - including the work of Alfifi and Abed (2017) whose results showed that female students perform better than their male counterparts do. They argued that student's gender strongly affects performance at university with girls performing better than boys do. On the contrary, some studies have shown that male students obtain higher mean scores than females (Larose, Bernier, & Tarabulsy, 2005), while in other studies, it was discovered that gender is not a significant predictor of academic performance at universities (Aderi, Jdaitawi, Ishak, & Jdaitawi, 2013; Fernández, Araújo, Vacas & Almeida, 2017). According to Emaikwu (2012), the academic achievement of male students is usually higher than that of their female counterparts irrespective of the mode of admission into the university. This work affirms the earlier report by Wikström and Wikström (2017) who asserted that boys are academically ahead of girls, especially in sciences.

Scholars who have advocated for affirmative action scheme in admitting students to university based on gender such as Ceballo, McLoyd and Toyokawa (2004) and Alfifi and Abed (2017) have often argued that female students admitted under the same criteria often perform better than their male counter-parts. Therefore, even when female students with lower pre-university grades are admitted to university, they will perform as well as their male counter-parts. This argument has however been challenged by several other scholars who opined that male students generally perform better than their female counterparts do. In a study conducted by Emaikwu (2012) for instance, it was reported that the academic achievement of male students was higher than that of their female counterparts, especially in sciences irrespective of the entry grades to university. The above results showed that gender has some significant impact on student performance at university level.

Some other scholars, however, have had a neutral view about the relationship between gender, entry grades and the academic performance of university students. In studies conducted by Aderi, Jdaitawi, Ishak and Jdaitawi (2013) and Wikström and Wikström (2017), for examples, it was reported that gender is not a significant predictor of academic performance at universities. On the other hand, Birch and Rienties (2014) revealed that academic performance follows a positive trend from D-grade to A-grade, irrespective of gender. This argument was later supported by some aspects of a study done by Wikström and Wikström (2017) who also discovered that gender does not strongly influence university performance. In fact, the two authors argued that university academic performance of students differs due to several factors - some of these factors are institutional-related while other are student-related - but not necessarily the student's gender.

5. Implications of the Findings and Conclusions

The results of this review have revealed that there are positive, negative and mixed correlations between entry grades and the exit academic performance of students at university. It has also highlighted major gaps and weaknesses in the admission criteria of university students that need attention by university stakeholders, educational planners and policy-makers. On the issue of gender, this study brought forth some contradictions and different findings: some articles reported that student performances were based on gender, while others stated that gender does not influence academic performance. These dilemma and scenarios also call for more evidence-based studies in order to streamline the admission criteria for both undergraduate and graduate programmes at university level. Recommendations from such studies could inform and significantly improve admission policies in different universities across the world.

References

Abdullah, N., & Mirza, M. (2018). Entry qualifications of students as predictors of academic performance in various degree programs in distance education setting in Pakistan. *Open Praxis, 10*(3), 237-247.

Aderi, M., Jdaitawi, M., Ishak, N. A., & Jdaitawi, F. (2013). The Influence of Demographic Variables on University Students' Adjustment in North Jordan. *International Education Studies, 6*(2), 172-178.

Aidoo-Buameh, J., & Ayagre, P. (2013). The Effect of Entry Grades on Academic Performance of University Accounting Students: A case of Undergraduates of Central University College. *Research Journal of Finance and Accounting, 4*(7), 2222–2847.

Ahikire, J. (2013, March). *Affirmative Action for Women in Uganda today: Navigating through the muddy waters and pushing on*. Retrieved from www.monitor.co.ug

Alfifi, H. Y., & Abed, J. (2017). Factors Contributing to Students' Academic Performance in the Education College at Dammam University. *Education Journal*, *6*(2), 77-83.

Aspelmeier, J. E., et al, (2012). Self-esteem, locus of control, college adjustment, and GPA among first-and continuing-generation students: A moderator model of generational status. *Research in Higher Education, 53*(7), 755-781.

Birch, D. M., & Rienties, B. (2014). Effectiveness of UK and international A-level assessment in predicting performance in engineering. *Innovations in Education and Teaching International, 51*(6), 642–652. https://doi.org/10.1080/14703297.2013.796722

Bush, J. (2012). Entry characteristics and academic performance of students in a master of pharmacy degree program in the United Kingdom. *American Journal of Pharmaceutical Educatio*n. https://doi.org/10.5688/ajpe767126

Ceballo, R., McLoyd, V. C., & Toyokawa, T. (2004). The influence of neighbourhood quality on adolescents' educational values and school effort. *Journal of Adolescent Research, 19*(6), 716-739.

Chathuranga, C. . (2016). The Impact of Past Education Performance on Grade Point Average in the Faculty of Social Sciences, University of Kelaniya, Sri Lanka . *Interntionl Journal of Humanitites and Social Science, 6*(4), 101–109.

Danilowicz-Gösele, K., Lerche, K., Meya, J., & Schwager, R. (2017). Determinants of students' success at university. *Education economics, 25*(5), 513-532.

Emaikwu, S. O. (2012). Assessment of the Impact of Students' Mode of Admission into University and their Academic Achievement in Nigeria, *International Journal of Academic Research in Progressive Education and Development, 1*(3). Retrieved from http://www.hrmars.com/admin/pics/1130.pdf

Eiselen, R., Jonck, B., & Strauss, J. (2007). A basic mathematical skills test as predictor of performance at tertiary level. *South African Journal of Higher Education, 21*(1), 38-49.

Ferrão, M., & Almeida, L. (2019). Differential effect of university entrance score on first-year students' academic performance in Portugal. *Assessment & Evaluation in Higher Education, 44*(4), 610-622.

Garton, B. L., Dyer, J. E., & King, B. O. (2000). The Use of Learning Styles and Admission Criteria in Predicting Academic Performance and Retention of College Freshmen. *Journal of Agricultural Education, 41*(2), 46–53. https://doi.org/10.5032/jae.2000.02046.

Geiser, S., & Santelices, M. V. (2007). Validity of high-school grades in predicting student success beyond the freshman year: High school record vs. standardized tests as indicators of four-year college outcomes. *CSHE Research & Occasional Paper Series, 35*. https://doi.org/10.2307/2393253.

Green, F., & Vignoles, A. (2012). An empirical method for deriving grade equivalence for university entrance qualifications: An application to A levels and the International Baccalaureate. *Oxford Review of Education, 38*(4), 473–491. https://doi.org/10.1080/03054985.2012.713858.

Henri, J. F. (2004). Performance measurement and organizational effectiveness: Bridging the gap. *Managerial Finance, 30*(6), 93-123.

Hoare, A., & Johnston, R. (2011). Widening participation through admissions policy - a British case study of school and university performance. *Studies in Higher Education, 36*(1), 21–41. https://doi.org/10.1080/03075070903414297

Hodara, M., & Lewis, K. (2017). *How Well Does High School Grade Point Average Predict College Performance by Student Urbanicity and Timing of College Entry?* REL 2017-250. Regional Educational Laboratory Northwest.

Kalowole, E. B., Orgini, M. I., & Fayomi, E. O. (2011). Cognitive Entry Points as Predictors of Students ' Academic Performance in Chemistry in Selected Nigerian Universities, Greener *Journal of Educational Research 1*(December), 1–6.

Koretz, D., Yu, C., Mbekeani, P. P., Langi, M., Dhaliwal, T., & Braslow, D. (2016). Predicting Freshman Grade Point Average From College Admissions Test Scores and State High School Test Scores. AERA Open, 2(4), 233285841667060. https://doi.org/10.1177/2332858416670601

Kurlaender, M., & Cohen, K. (2019). *Predicting College Success: How Do Different High School Assessments Measure Up?* Policy Analysis for California Education, PACE.

Kutty Radhakrishnan, A., Lee, N., & Young, M.-L. (2012). The influence of admission qualifications on the performance of first and second year medical students at the International Medical University, *International journal of medical education, 2012 6*(2): 10-17.

Kwesiga, J. C., & Ahikire, J. (2006). On student access and equity in a reforming university: Makerere in the 1990s and beyond. *Journal of Higher Education in Africa/Revue de l'enseignement supérieur en Afrique*, 1-46.

Kyoshaba, M. (2009). *Factors affecting academic performance of undergraduate students at Uganda Christian University*. Unpub. Master of Arts in Educational Management Dissertation, Makerere University, Uganda.

Lambe, P., & Bristow, D. (2011). Predicting medical student performance from attributes at entry: A latent class analysis. *Medical Education, 45*(3), 308–316. https://doi.org/10.1111/j.1365-2923.2010.03897.x

Larose, S., Bernier, A., & Tarabulsy, G. M. (2005). Attachment state of mind, learning dispositions, andacademic performance during the college transition. *Developmental Psychology*, *41*(1), 281.

Lasselle, L., McDougall-Bagnall, J., & Smith, I. (2014). School grades, school context and university degree performance: evidence from an elite Scottish institution. *Oxford Review of Education, 40*(3), 293–314. https://doi.org/10.1080/03054985.2014.900485

Melan, E. H. (2002). *Process management. In Synergy Matters* (pp. 235-239). Springer, Boston, MA.

Mercer, A., & Puddey, I. B. (2011). Admission selection criteria as predictors of outcomes in an undergraduate medical course: A prospective study. *Medical Teacher, 33*(12), 997–1004. https://doi.org/10.3109/0142159X.2011.577123

Mlambo, V. (2011). An analysis of some factors affecting student academic performance in an introductory biochemistry course at the University of the West Indies, Caribbean, *Teaching Scholar, 1*(2), 70–92.

Mutiso, S. K., & Muthama, T. M. Determinants of Academic Performance for Undergraduate Students in Kenya: An Educational Production Approach.

Myburgh, C. (2019). *Predicting academic success: towards an admission and placement model* (Doctoral dissertation, University of Pretoria).

Niessen, A. S. M., Meijer, R. R., & Tendeiro, J. N. (2016). Predicting performance in higher education using proximal predictors. *PLoS ONE, 11*(4), 1–14. https://doi.org/10.1371/journal.pone.0153663

Nshemereirwe, C. V. (2014). *The relationship between pre-university schooling and university grades* (Doctoral dissertation, University of Twente, The Netherlands).

Onsongo, J. (2009). Affirmative action, gender equity and university admissions – Kenya, Uganda and Tanzania 1. *London Review of Education, 7*(1), 71–81. https://doi.org/10.1080/14748460802700710

Opoko, A., Alagbe, O., Aderonmu, P., Ezema, I., & Oluwatayo, A. (2014). *Entry qualifications and academic performance of Architecture students in building structures in Covenant University - a private university located in Otta, Ogun State, Nigeria*. Proceedings of EDULEARN14 Conference, (July), 1635–1641. https://doi.org/ISBN: 978-84-617-0557-3

Peres, P. (2017). The Ecology of Higher Education – A systematic Literature Review. European *Journal of Open, Distance and E-Learning, 20*(1). Retrieved from http://www.eurodl.org/?p=current&sp=review&article=741

Richardson, M., Abraham, C., & Bond, R. (2012). Psychological correlates of university students' academic performance: A systematic review and meta-analysis. *Psychological Bulletin, 35*.

Roşeanu, G., & Drugaş, M. (2011). The admission criteria to the university as predictors for academic performance: A pilot study. *Journal of Psychological and Educational Research, 19*(2), 7–19.

Salahdeen, H. M., & Murtala, A. B. (2005). Relationship between Admission Grades and Performances of Students in the First Professional Examination in a New Medical School. *African Journal of Biomedical Research, 8,* 51–57. Retrieved from http://www.bioline.org.br/md

Sahney, S., & Thakkar, J. (2016). A comparative assessment of the performance of select higher education institutes in India. *Quality Assurance in Education, 24*(2), 278-302.

Saupe, J. L., & Eimers, M. T. (2010). Correcting correlations when predicting success in college, *Association for Institutional Research* (NJ1), 1–37.

McKenzie, K., & Schweitzer, R. (2001). Who succeeds at university? Factors predicting academic performance in first year Australian university students, *Higher Education Research & Development, 20*(1), 21-33.

Sandow, P. L., at al, (2002). Correlation of admission criteria with dental school performance and attrition. *Journal of Dental Education, 66*(3), 385-392.

Seelen, L. P. (2013). Is Performance in English as a Second Language a Relevant Criterion for Admission to an English Medium University?, *Higher Education, 44*(2), 213–232.

Shachar, M., & Neumann, Y. (2010). Twenty Years of Research on the Academic Performance Differences Between Traditional and Distance Learning: Summative Meta-Analysis and Trend Examination. *MERLOT Journal of Online Learning and Teaching, 6*(2).

Shehry, A. Al, & Youssif, S. M. A. (2017). Factors Affecting Academic Performance of Undergraduate Students at Najran Preparatory Year for Girls- Najran University 2015-2016. *International Journal of Asian Social Science, 7*(1), 1–18. https://doi.org/10.18488/journal.1/2017.7.1/1.1.1.18

Stegers-Jager, K. M. (2018). Lessons learned from 15 years of non-grades-based selection for medical school. *Medical Education, 52*(1), 86–95. https://doi.org/10.1111/medu.13462

Stuenkel, D. L. (2006). At-risk students: do theory grades + standardized examinations= success? *Nurse Educator,* 207–212.

Uganda Government. (2001). *Universities and Other Tertiary Institutions Act, 2001; (As Amended in, 2003 and As Amended in, 2006)*. Kampala: Author.

Vidal Rodeiro, C., & Zanini, N. (2015). The role of the A* grade at A level as a predictor of university performance in the United Kingdom. *Oxford Review of Education, 41*(5), 647–670. https://doi.org/10.1080/03054985.2015.1090967

Wamala, R., Kizito, S. O., & Kakumba, U. (2012). Outcomes And The Academic Achievement. *American Journal of Business Education, 5*(6), 779–786.

Wamala, R. (2013). Relevance of prior academic qualifications to predicting the academic achievement of undergraduate students: an analysis of law enrollees at Makerere University.

Wamala, R., Maswere, D. W., & Mwanga, Y. (2013). Competence in Mathematics and academic achievement: an analysis of enrollees in the Bachelor of Science in Actuarial Science Program. *American Journal of Business Education (AJBE), 6*(3), 401-408.

Wambugu, L., & Emeke, A. (2013). *Relationship between Entry Qualification and Academic Performance in Undergraduate Science Courses at the University of Nairobi, Kenya*.

Wikström, C., & Wikström, M. (2017). Group Differences in Student Performance in the Selection to Higher Education: Tests vs Grades. *Frontiers in Education, 2(*August), 1–10. https://doi.org/10.3389/feduc.2017.00045

Wright, S. R., & Bradley, P. M. (2010). Has the UK Clinical Aptitude Test improved medical student selection? *Medical Education, 44*(11), 1069–1076. https://doi.org/10.1111/j.1365-2923.2010.03792.x

Zwick, R. (2012). The Role of Admissions Test Scores, Socioeconomic Status, and High School Grades in Predicting College Achievement, 49(2), 23–30. https://doi.org/10.7764/PEL.49.2.2012.3.

ASIAN INSTITUTE OF RESEARCH
Connecting Scholars Worldwide

The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 151-158
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.182

Preparing Students for Success in a Changing World: The Role of Virtual Whiteboards in the Modern Classroom

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Abstract
Information communication and technologies (ICT) as a facilitator of active learning (AL) in higher education is becoming an increasingly important tool. One of the most significant developments with the use of ICT in higher education over the last decade has been the integration and application of e-learning systems to support the processes of teaching and learning. The implementation of ICT into the classroom should not be seen as merely an add-on, but should be included with purpose: meaningfully implemented based on pedagogy. Despite the suggested power of ICT in educating students for a modern future, the implementation of these technologies into the classroom is not as widespread as expected; debate still abounds as to what role ICT should play in the classroom. This research examined a variety of dependable attributes that assessed the engagement of undergraduate students (n_1=87) through virtual whiteboards. This quantitative inquiry revealed that students perceived virtual whiteboards as beneficial for their learning and improved their engagement level in the classroom. Furthermore, a correlation between the level of engagement and the year of study was revealed as the primary implication of this research.

Keywords: Information and Communication Technology, E-Learning, Active Learning

1. Introduction

Teachers are increasingly required to incorporate ICT and e-learning elements into the modern classroom. The push for this implementation seems to be coming from all angles – commercial, political, and societal – and driven by the commonly-held belief that educational institutions can better meet the needs of all students than is currently the case. A good starting point towards progressing and modernizing education into the future would be to gain an understanding of what influences a teacher to purposefully implement ICT into the classroom (San-Martín, Jiménez, Rodríguez-Torrico & Piñeiro-Ibarra, 2020). Several factors may be influencing teachers' decision-making processes surrounding the implementation of ICT into the classroom. To begin with, many teachers believe they must first have the requisite skills in using ICT. Teachers feel the need to not only be able to use the technologies, but also to be confident in their use under the judgmental gaze of their digital native

students. Competence using ICT would, thus, likely have a positive relationship with the implementation of ICT into the classroom, for both their own development and that of their students (Meskhi, Ponomareva & Ugnich, 2019). Teachers' beliefs about the importance of ICT in the classroom would also likely influence implementation decisions. This could manifest in two forms: (1) whether the teacher believes that ICT benefits teaching and learning in general and (2) whether the teacher believes the use of ICT in the classroom will be specifically beneficial to students in the development of relevant modern skills (Kew, Petsangsri, Ratanaolarn & Tasir, 2018). The previously mentioned factors may be predictive of the implementation of ICT into the classroom, but these do not speak to any purposeful implementation. Instead, purposeful implementation may also be predicted by teacher beliefs about teaching and learning. This study aims to analyze virtual whiteboards and how students perceive their ease of use, their usefulness, and students' digital competency. Furthermore, the study was guided by the following research questions:

RQ1. Does the virtual whiteboard – as a facilitator for the active learning pedagogy – affect the students' level of engagement?

RQ2. Does the socio-demographic profile (gender, age range, year of study, or nationality) affect the students' level of engagement?

To adequately examine the aforementioned research questions, the following conceptual framework was developed (Figure 1) wherein the accumulated mean ratings of individual attributes were compared to the overall student engagement level.

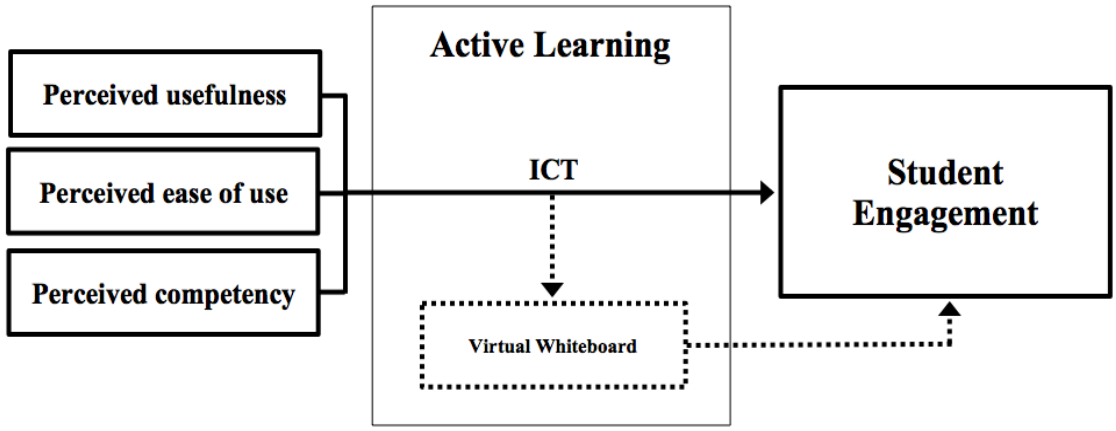

Figure 1: The conceptual framework to assess the level of student engagement

2. Literature Review

This section will introduce and discuss three topics: the role of information and communication technology (ICT) in higher education, active learning as pedagogy, and the collaborative virtual whiteboard as a facilitator of active learning.

2.1. The Role of ICT in Higher Education

Of course, positive beliefs about ICT in the classroom and their influence on student outcomes would likely have a positive relationship with the implementation of ICT into the classroom (Meskhi et al., 2019). For example, teachers who endorse student-centered learning, where the focus in the classroom is more on the student than the teacher, might also be more likely to support ICT in the classroom because they can enable increased levels of self-directed learning (San-Martín et al., 2020). Furthermore, teachers who endorse inquiry-based learning, where students are required to delve deeply into more open-ended questions, might be more open to implementing ICT into the classroom because they can allow students to more deeply explore concepts and ideas where non-digital teaching tools might be incapable or inefficient. On the other hand, teachers who support more traditional methods of teaching and learning, such as content-learning (or rote-learning) where students are

expected to memorize facts and details, might be less inclined to support the implementation of ICT into the classroom. This because they are considered unnecessary and potentially distracting (San-Martín et al., 2020), although even here there is the potential for purposeful implementation. Traditional teachers could find uses, for example, for online skills development websites that focus on basic numeracy or literacy (Kew et al., 2018; Meskhi et al., 2019).

2.2. Active Learning as Pedagogy

Many of the previously mentioned concerns can be addressed through the implementation of active learning strategies that encourage students to actively participate in the online course content (Schlebusch, 2018). Typically, active learning (AL) is not associated with any online or blended learning environment. However, there are several strategies for effectively incorporating and practicing active learning in non-face-to-face settings, including the use of well-conceived discussions, group work, and creating a collaborative environment that encourages and fosters a community of learning, i.e. the technology-enhanced flipped classroom method (Fuchs, Aghaee and Ferati, 2020). Khan et al. (2017) state that it is critical to weave AL through the major components of an online or blended course, including discussions, assignments, and assessments, to promote a high level of student engagement (Khan et al., 2017). AL is a method for engaging students in higher-order thinking tasks (e.g. analysis, synthesis, evaluation, reflection) through various activities so that students achieve more than merely the passive part of learning. For example, instead of listening to a lecture on some topic, students would discuss the topic with each other, imagine how it could be used in practice, provide concrete examples, and give a presentation on these examples. This could be done individually, but is often done in groups so that multiple students can discuss the same topic together, using their examples and asking questions during the presentations. Although AL is said to require more effort from both teachers and students, many in-class activities are obvious examples of active learning: group discussions of material, giving feedback and doing a reflection on one's work, peer evaluation, giving presentations on the material, etc. (Cook & Babon, 2017).

2.3. Online Whiteboard as a Facilitator of AL

As a tool, one piece of technology often cited in the literature to promote active learning is the virtual whiteboard (Ivone, Jacobs & Renandya, 2020). A virtual whiteboard is an interactive screen display that allows users to write, draw, and present media, audio, pictures, or other information to promote collaboration (Figure 2). Students can interact with each other as well as the content. The rich history of interactive virtual whiteboards highlights that there has been a steady rise in their application in many Western European countries, with near-universal applications of virtual digital whiteboards (Ivone et al., 2020). The evolution of these tools in higher education has followed a similar escalation of use (Helmold, 2021), although the literature on higher education student preferences in engaging in learning via this medium has had limited exploration. Helmold (2021) found that the use of digital whiteboards can promote "active, critically engaged and reflective experiences".

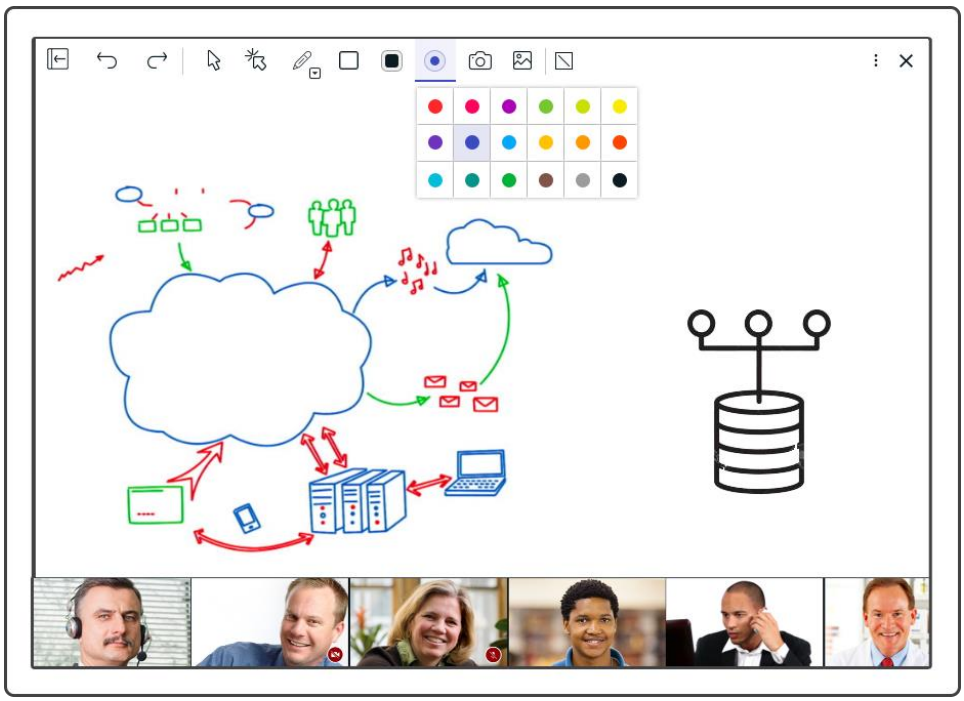

Figure 2: Mockup of a virtual whiteboard (adopted from Newrow, 2020)

3. Methods and Materials

3.1. Sample

Undergraduate students were recruited to complete a bilingual online survey. The sample was limited to full-time students enrolled in a Bachelor of Business Administration program. After discarding three responses due to incomplete information, the final sample size (n_1=87) consisted of 74% female students and 26% male students. Other socio-demographic characteristics were the year of study, age range, and nationality (Table 1).

Table 1: Socio-demographic profile

Characteristics	Absolute	Percent
Gender		
Female	64	73.6%
Male	23	26.4%
Year of Study		
First Year	39	44.8%
Second Year	48	55.2%
Age Range		
18 year or below	12	13.8%
19 – 20 years old	68	78.2%
21 – 22 years old	6	6.9%
23 years or above	1	1.1%
Nationality		
Thai	84	96.6%
Foreign	3	3.4%

3.2. Procedure

Convenience sampling was utilized and the responses were collected through a self-administered survey using Google Forms. The survey contained seven questions that established the socio-demographic profile, as well as

12 items on a 5-point Likert-type scale. The data collection was implemented in February 2021 at a large university in southern Thailand.

3.3. Analysis

Statistical descriptive analysis was used as means to analyze the data through the open-source software JASP. The data was analyzed by mean ratings, minimum and maximum values, and standard deviation. The results of the survey were presented through visualization aids and in the form of descriptive tables.

3.4. The Setting

The corresponding course instructor requested the participants express their sentiments or opinions through the means of the virtual whiteboard on different occasions during the online class to facilitate a themed discussion. The virtual whiteboard function that was utilized was imbedded in Microsoft Teams, which was used as videoconferencing application to facilitate the online classes.

4. Results and Discussion

4.1. RQ1. Does the virtual whiteboard – as a facilitator for the active learning pedagogy – affect the students' level of engagement?

The socio-demographic profile revealed that 73.6% (n=64) of the respondents were female, whereas 26.4% (n=23) were identified as male. Furthermore, the participants of the study were either in their first (44.8%) or second year of studies (55.2%). Almost eight tenths (78.2%) of the participants were 19-20 years of age. The last characteristic for the socio-demographic profile of the participants was their nationality, wherein the majority of students were Thai (96.6%) and three (3.4%) were foreign degree students. Based on the low amount of data from foreign students (n=3), this attribute was removed from further analysis due to its unjustifiability. The first research question sought to examine whether the virtual whiteboard – as an established facilitator of the active learning pedagogy (Helmold, 2021) – affects, either positively or negatively, the level of student engagement. Three factors were analyzed to gauge the engagement level, wherein each factor was made up of four individual survey items. Firstly, the perceived usefulness of the virtual whiteboard (Table 2) received an aggregated mean rating of 3.70 (SD = .95). The weighted mean indicates that the students agreed with the items that contributed to the perceived usefulness of the virtual whiteboard. This result validates earlier case studies that identified a high level of perceived usefulness among language students (Huang et al., 2012) and in K-12 education (Bourbour, 2020).

Table 2: Empirical data with mean rating per item from the survey

No.	Question Item	Mean[1]	SD
Perceived usefulness			
Q1	Virtual whiteboards make classes more interesting	3.56	0.85
Q2	Virtual whiteboards make classes more fun	4.02	0.75
Q3	Virtual whiteboards make classes more enjoyable	3.27	1.14
Q4	Virtual whiteboards make classes more active	3.95	1.05
	Aggregated mean rating (Q1 - Q4):	**3.70**	**0.95**
Perceived ease of use			
Q5	I learned better during the class with the virtual whiteboard	3.23	0.85
Q6	I would like my teacher to use the virtual whiteboard more	2.82	1.24
Q7	I want to participate more in classes with the virtual whiteboard	2.65	1.07
Q8	I learned more during the class with the virtual whiteboard	3.15	0.96

	Aggregated mean rating (Q5 - Q8):	**2.96**	**1.03**
Perceived competency			
Q9	I find it easy to use the virtual whiteboard during class	3.88	0.63
Q10	I need more instruction on how to use the virtual whiteboard[2]	3.78*	0.94
Q11	I experienced technical problems using the virtual whiteboard[2]	3.85*	0.68
Q12	I find the virtual whiteboard sessions too time consuming[2]	3.15*	1.19
	Aggregated mean rating (Q9 - Q12):	**3.67**	**0.86**

[1]Ratings obtained from a Likert-type five points scale ranging from lowest rating to highest rating, i.e. Fully Disagree (1), Slightly Disagree (2), Neutral (3), Slightly Agree (4), and Fully Agree (5)

[2]Converted score due to the negative nature of the question. The score was converted to make it comparable with the mean ratings from the other questions. *The original scores: Q10: 2.22; Q11: 2.15; Q12: 2.85

Secondly, the factor about perceived ease of use received the lowest rating amongst the three factors, with a corresponding mean rating of 2.96 (SD = 1.03). Q6 and Q7 in particular contributed to this low mean rating. The aggregated mean rating indicates a neutral view from the students about the ease of use, which contrasts the research findings of Rahmi, Birgoren, and Aktepe (2018). The authors identified that the virtual whiteboard had highly positive perceived ease of use. Here, the socio-demographic profile of both studies might be the differentiating factor, or the fact that the smaller sample size of this paper does not allow for generalization beyond its discipline. Lastly, the perceived competency in the use of the virtual whiteboard was examined; the mean rating yielded 3.67 (SD = 0.86), indicating that students perceived themselves as competent in the use of this technology. To summarize the findings and discussion, it can be stated that undergraduate students recognized the usefulness of the virtual whiteboard and considered themselves competent in the use of this technology. However, the perceived ease of use was not on par with the previous two factors, which suggests further research is required into the underlying reasons to identify the cause (Table 3).

Table 3: Classification of empirical results based on weighted scale

Likert-type item	**Attribute**
Fully Disagree	
1.00-1.79	-
Disagree	
1.80-2.59	-
Neutral	
2.60-3.39	$\mu_x = 2.96$; Perceived ease of use
Agree	
3.40-4.19	$\mu_x = 3.67$; Perceived competency $\mu_x = 3.70$; Perceived usefulness
Fully Agree	
4.20-5.00	-

4.2. RQ2 Does the socio-demographic profile (gender, age range, year of study, nationality) affect the students' level of engagement?

Based on the design of the survey, it was feasible to slice and analyze the data with four different socio-demographic characteristics. These characteristics included the students' gender, age range, year of study, and nationality. The latter was dismissed from further analysis because the data for foreign students was insufficient (n=3), as the majority of students were Thai (n=84). Furthermore, the majority of students (78.2%) were between 19-20 years of age, which resulted in an unsatisfactory distribution of responses based on the total sample size.

Hence, this characteristic was also dismissed from further analysis. What remained was the year of study and gender. For the year of study, the distribution of responses was almost equal between first-year students (44.8%) and second-year students (55.2%). Concerning gender, the distribution of responses was 73.6% (n=64) female participants and 26.4% (n=23) male participants. A descriptive analysis based on these two characteristics revealed that there was a significant variance between the year of study, which was further analyzed by the factor (Figure 3). First-year students expressed their perceived usefulness for virtual whiteboards with a mean rating of 3.02, whereas their one-year-older peers perceived this factor with a mean rating of 4.26. The difference between both mean ratings is 1.24, which is a significant disparity and similar to a discovery made by Kołodziejczak and Roszak (2017) in secondary education. Furthermore, the difference between the mean ratings for the factor evaluating perceived ease of use was 0.29, whereas the difference for perceived competency was 1.51.

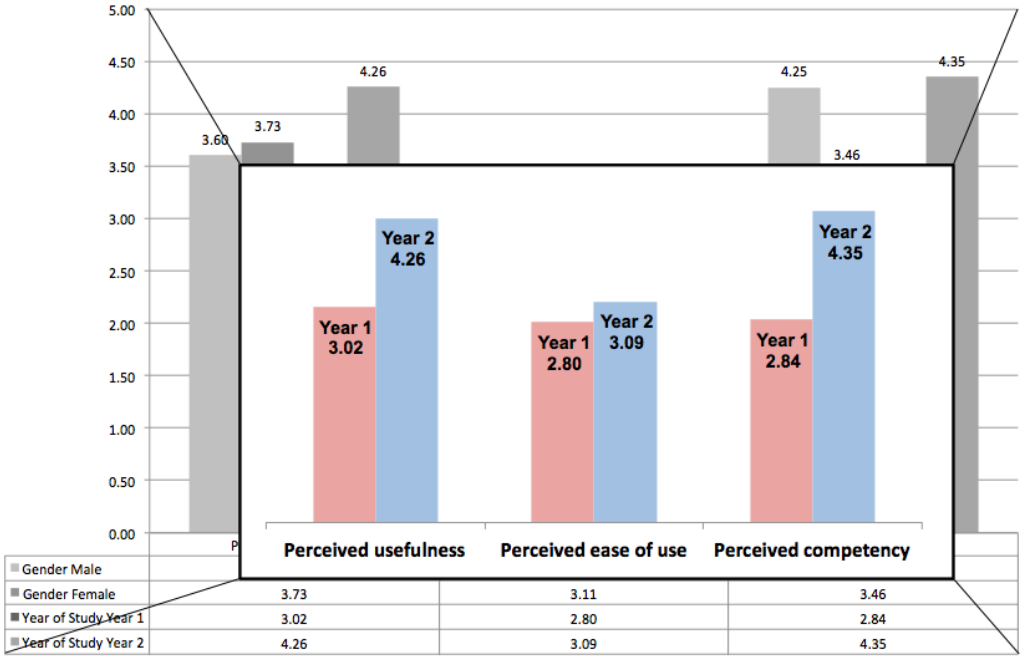

Figure 3: Student engagement by year of study based on empirical data

This finding suggests that first-year students do not feel as competent as their older peers in the use of the virtual whiteboard. Looking at the associated classification, this indicates that first-year students feel neutral about their competency in the use of the virtual whiteboard, whereas second-year students perceive their competency as high in the use of the virtual whiteboard. Although no related case study supports this important finding, the implication suggests that the virtual whiteboard is a suitable method to increase student engagement in online education. However, this method is less suitable for students in their first year of study.

5. Conclusion

The paper revealed that undergraduate students have a generally positive perception toward the usefulness of virtual whiteboards ($\mu_x = 3.70$) in their online classroom, as well as high perceived competency in their use of this technology ($\mu_x = 3.67$). Nevertheless, a third factor that completes the student engagement rating does not mirror the positive views and yielded a neutral assessment concerning the perceived ease of use ($\mu_x = 2.96$). While the nature of this study did not reveal the underlying reasons for this dissimilarity, it was identified that there is a significant difference in perception based on year of study. The virtual whiteboard is a suitable facilitator of the active learning pedagogy that increases student engagement, although it is not a suitable method for first-year students. Based on the implications from this research, two specific recommendations can be formulated: (1) to conduct a large-scale case study with a larger sampling size to increase the validity of the results, as well as allow for testing of additional socio-demographic attributes such as nationality and gender. Furthermore, (2) to perform a mixed-methods case study that purposefully examines perspectives of a focus

group to gain a more comprehensive understanding of the dissimilar levels of engagement between first-year and second-year students. It was not the aim of this study to propose new methods that can be used for student engagement, nor to produce a best-practice guide. However, the corresponding engagement levels associated with the virtual whiteboard are promising and offer an alternative for educators when trying to increase student engagement in online education.

6. Acknowledgement

The author would like to thank the participants who contributed to the research. Moreover, the author would like to declare not having potential conflicts of interest concerning the research, authorship, or publication of this article. The research received no funding.

References

Bourbour, M. (2020). Using digital technology in early education teaching: learning from teachers' teaching practice with interactive whiteboard. *International Journal of Early Years Education*, pp. 1-18. https://doi.org/10.1080/09669760.2020.1848523

Cook, B. R., & Babon, A. (2017). Active learning through online quizzes: better learning and less (busy) work. *Journal of Geography in Higher Education*, 41(1), pp. 24-38. https://doi.org/10.1080/03098265.2016.1185772

Fuchs, K., Aghaee, N. and Ferati, M., (2020). Merits of the Technology-enhanced Flipped Classroom (TEFC) concept in Higher Education. In Norsk IKT-konferanse for forskning og utdanning (No. 4). https://doi.org/10.6084/M9.FIGSHARE.13546640.V1

Helmold, M. (2021). New Work in Education and Teaching. In *New Work, Transformational and Virtual Leadership* (pp. 143-155). Springer, Cham. https://doi.org/10.1007/978-3-030-63315-8_14

Huang, Y. M., Huang, Y. M., Huang, S. H., & Lin, Y. T. (2012). A ubiquitous English vocabulary learning system: Evidence of active/passive attitudes vs. usefulness/ease-of-use. *Computers & Education*, 58(1), pp. 273-282. https://doi.org/10.1016/j.compedu.2011.08.008

Ivone, F. M., Jacobs, G. M., & Renandya, W. A. (2020). Far apart, yet close together: Cooperative learning in online education. *Studies in English Language and Education*, 7(2), pp. 271-289. https://doi.org/10.24815/siele.v7i2.17285

Kew, S. N., Petsangsri, S., Ratanaolarn, T., & Tasir, Z. (2018). Examining the motivation level of students in e-learning in higher education institution in Thailand: A case study. *Education and Information Technologies*, 23(6), pp. 2947-2967. https://doi.org/s10639-018-9753-z

Khan, A., Egbue, O., Palkie, B., & Madden, J. (2017). Active learning: Engaging students to maximize learning in an online course. *Electronic Journal of E-Learning*, 15(2), pp. 107-115. Retrieved from https://academic-publishing.org/index.php/ejel/article/view/1824/1787

Kołodziejczak, B., & Roszak, M. (2017). ICT competencies for academic e-learning. Preparing students for distance education-authors' proposal. International *Journal of Information and Communication Technologies in Education*, 6(3), pp. 14-25. https://doi.org/10.1515/ijicte-2017-0012

Meskhi, B., Ponomareva, S. & Ugnich, E. (2019), "E-learning in higher inclusive education: needs, opportunities and limitations", *International Journal of Educational Management*, Vol. 33 No. 3, pp. 424-437. https://doi.org/10.1108/IJEM-09-2018-0282

Newrow, (2020). Draw Out More Engagement - Digital Whiteboard. *Newrow, a Kaltura Company*. Retrieved from https://www.newrow.com/features/

Rahmi, B. A. K. I., Birgoren, B., & Aktepe, A. (2018). A meta-analysis of factors affecting perceived usefulness and perceived ease of use in the adoption of e-learning systems. *Turkish Online Journal of Distance Education*, 19(4), pp. 4-42. https://doi.org/10.17718/tojde.471649

San-Martín, S., Jiménez, N., Rodríguez-Torrico, P., & Piñeiro-Ibarra, I. (2020). The determinants of teachers' continuance commitment to e-learning in higher education. *Education and Information Technologies*, 25(4), pp. 3205-3225. https://doi.org/10.1007/s10639-020-10117-3

Schlebusch, C. L. (2018). Computer anxiety, computer self-efficacy and attitudes towards the Internet of first year students at a South African university of technology. *Africa Education Review*, 15(3), pp. 72-90. https://doi.org/10.1080/18146627.2017.1341291

The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 159-167
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.183

The Implementation of the New Technologies in the Modern Teaching of Courses

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Abstract
Rapid developments in science require the application of new technologies in the field of education, aiming at changing the traditional and obsolete ways of teaching, providing ground for new forms. These new forms of teaching do not replace the teacher but adapt his role from omniscient to mentor and role model for students. With the use of technological means and the teacher's contribution to the teaching of the courses, the results in learning - let alone in the understanding of specialty courses- can be even more remarkable and bring about changes and perspectives for new approaches in the field of education. The aim of this survey was to investigate the use of new technologies by teachers today in the teaching of specialty courses and to what extent this implementation can improve the learning process. The results of the research show that our sample not only has a positive attitude towards the use of new forms of technology in the teaching of specialty courses but also seems to understand the benefits that arise from their use for the teachers themselves, for students, and the whole educational process.

Keywords: New Technologies, Teaching, Specialty Courses, Learning, Educational Technology

1. Introduction

Educational technology as a scientific field has been evolving over the past years. Therefore, according to current data, educational technology is a vague concept that could be approached as a field of practice in teaching. The term educational technology, albeit of unknown origin, pre-existed from the early stages of the application of technology (Saettler, 2004). It is based on research on how to learn, communicate and combine both human and non-human resources to bring about positive results.

One definition that can approach educational technology is the study and ethical practice that aims to facilitate the learning process and improve performance by creating, using, and managing appropriate educational processes and tools (Januszewski & Molenda, 2013). Technology has added multifaceted new dimensions to teaching and learning, which include new ways of teaching every aspect of language, new pedagogical and assessment approaches, as well as new ways of conceiving and conducting research and development (Chapelle & Sauro, 2017).

The more developed a culture is, the more complex the technology designed to meet the needs and requirements of the population. The same is true in the field of education where any significant change and redefinition of priorities and goals in the learning process can and is able to modify the means of technology applied. It can involve innovative methods in the teaching process and combine different elements such as people, technological devices, techniques and processes as well as ideas aiming at learning and supporting all 21st-century metacognitive skills such as initiative, communication, collaboration, adaptability and the use of the internet (Bates & Sangra, 2011).

New technologies and teaching

The main objective of innovative educational technologies is to prepare a person for life in an ever-changing world. It is impossible to imagine a modern lesson without the introduction of innovative technologies (Rahmatova,2020). They need to be introduced and consolidated in the field of education, providing substantial opportunities for students and educators for new forms of teaching in course teaching.

A key concern in the use of alternative teaching methods with modern supervisory tools is the strengthening of teaching. This is facilitated by exploring sources for knowledge acquisition in order to help modernize teaching and contribute to the understanding of teaching units by providing content to the theoretical framework of teaching (De Biasi et al., 2006). Some forms of new technologies seem to be widespread and used more extensively by teachers, while others are not yet widespread and integrated into teaching. The term New Technologies includes educational software, internet, e-learning, educational multimedia, and interactive whiteboard (Roblyer, 2008).

The advent of new technologies in the field of education is a revolutionary method that promises new perspectives in the teaching of specialty courses, as opposed to traditional forms of interaction and teaching. The communication between teacher and trainee now takes on a new dimension and electronic form. Both the teacher and the student have an active role in learning and exchange information and knowledge in the context of teaching. The role of the teacher and the ability to perform his work is constantly updated under the influence of the social and economic environment, but also of cultural changes (Efthymiou & Vitsilaki, 2008).

New forms of technology in the teaching of both general and specialty courses lead to a readjustment of roles in education and the educational process changes from teacher-centered to student-centered or team-based (Griva, Thanopoulos, Armakolas, 2019a). More specifically, the teacher ceases to provide sterile knowledge to students and retains the role of counselor and mentor, utilizing computer tools in education. In addition, his role is to explain to students the new e-learning system and how to use it to filter the inexhaustible sources of knowledge provided to them through the use of the internet. As a result, students learn how to train and acquire critical thinking (Hüttner, 2008; Armakolas, Panagiotakopoulos, Fragkoulis, 2019).

Also, the use of digital technology in classroom activities can enhance new forms of dialogue (Griva, Thanopoulos, & Armakolas, 2019b). Interactive skills refer to the specific use of language as a tool for understanding knowledge. It is a way of creating understanding based on one's perception, while allowing other ideas and opinions to be adapted or integrated into one's own thinking. Thus, we argue that it is valuable that teachers can support the development of students' interactive skills (Rasmussen & Ludvigsen, 2010; Headrick & Hall, 2013; Rubel, Hall-Wieckert & Lim, 2017).

Research has shown that it is not the technology itself that increases the quality of classroom discussions. New technologies need to be integrated with teacher practices and homework design (Dillenbourg, Jarvela & Fisher, 2009). It has also been shown that the importance of establishing rules that are set and regulated within the classroom needs to productively address the presence of technologies (Rasmussen et al., 2012).

Teaching specialty courses

The role of new technologies in the teaching of specialty courses is significantly important because it integrates technique and general education. Specialty courses usually take place in the context of laboratory courses and the use of new forms of technology helps to integrate theory and practice (Hüttner, 2008).

For the more diverse learners, the use of computer technology for all facets of second language learning has dramatically increased as the reach of the internet continues to spread, providing access to social media, reference materials, online instruction and more (Chappelle & Sauro, 2017). The power and dynamics of the image facilitate the transmission of specialized knowledge, but also its better assimilation by students. In the environment of mathematical science, the introduction of new technologies provided enrichment, glamor and at the same time opened new avenues for exploration, experimentation, computational speed, and quality upgrading. For example, color intervention distinguished geometric concepts (Verykios, 2010).

The increased access to a large volume of information works beneficially for the learner himself since he increases his autonomy from the moment, he becomes active in learning and is called to evaluate the sources of knowledge provided to him and to cross-reference information (Armakolas, Panagiotakopoulos, Karatrantou, 2018). This is where the biggest difference between the use of new forms of technology in teaching and the traditional teacher-centered learning model lies, as the use of new technologies welcomes experiential discovery.

Even for those who are inclined to experiment with emerging technologies, it can be challenging to identify which resources, tools, or Web sites may best fit a particular lesson, activity, or goal. Many of the most compelling opportunities are situated within the same global social and technology trends that have become commonplace in our daily lives, including social media, artificial intelligence, big data and augmented realty (Kesiler, 2018). As a result, students' critical thinking is sharpened and students begin to perceive in a multifaceted way the subject of general courses, but also their specialty which is the subject that concerns them most in their later professional career (Griva, Thanopoulos, Armakolas, 2019a).

With the use of new technologies, the curricula of the specialty courses are modernized and adapted to the requirements of the labor market, optimizing the individual qualifications of the students, without any social and geographical distinctions, since the use of new technologies favors the change of learning environment (Papadiamantopoulou, Papadiamantopoulou, Armakolas, Gomatos, 2016; Armakolas, Kazana, Mitroulia, 2020). Asynchronous and modern forms of communication and correspondence do not limit place-based learning. More specifically, it does not force students to attend within the classroom, nor does it require the simultaneous presence of the teacher in order to achieve learning (Kazana, Armakolas, Zotos, 2019). Therefore, distance education is one of the main benefits of using new forms of technology in the teaching of specialty courses, as well as in general education (Armakolas, Panagiotakopoulos, Karatrantou, 2018) and has undoubtedly played a catalytic role in the Pandemic era to maintain regularity of the educational process.

From the research of the Public Institute of Educational Training on teachers of different specialties, it was found that the use of supervisory tools in teaching and more specifically technological tools such as the computer are among the first choices of teachers. This is justified by the possibilities it offers for the active participation of the trainees and discussion in the nature of the subject (Saginetou, 2019).

Most educational institutions, however, do not have a plan for learning new technologies. They do not know the goals of learning new technologies (Bates & Sangra, 2011). The teaching of learning new technologies and the use of technology is mainly aimed at supporting and providing not only the knowledge but also the skills of the 21st century. Flexible access to knowledge has increased teacher-learner interaction, the provision of personalized learning and has promoted student self-efficacy, communication, collaboration, and adaptability to the data and requirements of modern society. The value and usefulness of new technologies are not limited only to education, but also to the society in general (Ahmadi, 2018; Koutsogiannis, 2007).

But Bates & Sangra in 2011 concluded that while teachers are willing to use technology to enhance the traditional teaching method, they do not change the way they teach. The use of new technology if not combined with a change in the way of teaching will not have tangible benefits in learning, but will only bring costs to the education system.

2. Method

The aim of this survey was to study the impact of new technologies in the field of education and specifically in the teaching of specialty courses. The specific aim of this research was to motivate the scientific staff that either works or will work in education, to integrate the new forms of technology in the teaching of the specialty courses, realizing its benefits.

In particular, the following research questions are studied:
Research Question 1. What is the attitude of teachers towards new forms of technology today?
Research Question 2. What new forms of technology are used by teachers in the teaching of specialty courses?
Research Question 3. What is the effect of the use of new forms of technology in the educational process?

The importance of the subject, according to the literature, lies in the fact that there is a need for the introduction of new forms of technology in the teaching of specialty courses. There have been several studies abroad that prove that they help the learning process and for this reason, their use by teachers is becoming more frequent. Based on these findings, an effort is being made to investigate the issue in Greece as well. The new scientific knowledge that will be produced will aim to help both teachers and staff of other specialties in the field of education and to motivate the state to take measures to introduce educators to the proper use of new technologies in education.

The present research was conducted from January to April 2020 and was qualitative, in the form of a semi-structured interview. This research is qualitative, due to the use of interviews. This type of research is suitable for an in-depth investigation of teachers' attitudes and perceptions towards the use of new forms of technology in the teaching of specialty courses. The goal of the qualitative investigation is not simply to record an attitude or behavior but a holistic understanding of it (Panagiotakopoulos & Sarris, 2016).

The sample for our research was eight teachers of specialty courses, who study in ASPAITE of Patras and specifically 4 men and 4 women with an average age of 38.4 years. In terms of years of service, the average for men was 8 years, while for women teachers it was 6 years. Men come from specialties in physiotherapy, economics – administration, and biology, while women from nursing, agriculture, information technology, and economics. Interview questions were based on research (Januszewski & Molenda, 2013; Bates & Sangra, 2011; Seet, Hong & Chai, 2019; Rasmussen & Ludvigsen, 2010; Headrich & Hall, 2013; Rubel et al, 2017).

3. Results

RQ 1. Teachers' attitudes towards new forms of technology

The first research question consisted of three sub-questions related to teachers' attitudes towards new forms of technology. To the first question about their attitude towards new forms of technology, all participants answered that they are positive. This fact is in line with research that supports the positive attitude of teachers towards the use of new forms of technology (Koutsoukou, 2014; Koutsogiannis, 2007). Others expressed it with enthusiasm, citing benefits that result from their use, such as arousing students' interest, that students participate more and that the lesson is done in a more enjoyable way. However, there were teachers who responded that they were cautious but sceptical. which is why they did not incorporate the new forms of technology in their teaching from the beginning of their teaching career. The use of new forms of technology for them was done gradually and in their effort to keep up with the technological developments of the time. In fact, the answer of a physiotherapy professor that "*in the future, he will join to a greater extent because he will enjoy many benefit*s" was typical.

In the second part question, teachers were asked to answer whether they believe that the benefits of using new forms of technology are limited to the teaching process. The response to this question was controversial in terms of the wording and the way our sample perceived it because some educators answered that those new forms of technology can be used in other areas of human activity in their daily lives. Typical was the response of a Biology teacher who states "*and in a company if someone worked and made a presentation at PowerPoint it would be easier to understand by the public for example*," others said that in addition to knowledge it provides metacognitive

skills such as socialization, the organization, and encouragement to further expand their spiritual horizons and familiarize students with the use of new forms of technology. As Bates & Sangra said in 2011, the ultimate goal of new forms of technology is to acquire 21st-century metacognitive skills such as taking initiative, communicating, collaborating, adapting, and using the internet. Another part of the sample refers to the use of new technologies again in teaching but outside the context of the classroom, pointing to their use in distance education via skype or the use of the internet from home. Summing up, from the answers collected, it appears that the benefits of new forms of technology are undoubtedly generalized beyond the space of teaching the specialty courses. The usefulness of new forms of technology is not limited to education, but also has benefits in society in general (Koutsogiannis, 2007).

In the third part question of the thematic unit, which concerns the attitude of teachers to new technologies, teachers were asked to give us an example that new technologies helped in the learning process. The examples used focused on the results and benefits of using new forms of technology in teaching. Typical answers were "*new technologies have untied the hands of teachers*," "*students are constantly asking questions and finding the lesson interestin*g," "*they showed a special interest*," "*what more experiential than to see them in a video on YouTube, they do not see only me and are bored*," "*the students felt as if they were participating in the process themselves*," "*the liveliness and immediacy increased the students' interest," "they see it as an experience from telling them, which is not so easy to understand on a practical level*," "*so the lesson became very fun, interesting, they laughed, wondered and were surprised by how easy the lesson can become, so they can understand things they did not know*"."These examples are in line with Januszewski & Molenda who in 2013 argued that educational technology facilitates the learning process and student performance. Also, the entry of new technologies enriches and gives glamor to the teaching of specialty courses (Verykios, 2010).

RQ 2. The use of new technologies in the teaching of specialty courses

The second research question concerned the use of new forms of technology i.e., modern supervisory tools, by teachers in the teaching of specialty courses. To the first part about which supervisory tools they consider appropriate and use in the teaching of specialty courses, the majority of teachers answered that they use more in the course presentation the Power Point, and the internet. Typical was the response of an economics teacher who justified his answer by saying that the PowerPoint presentation helps him to present diagrams and figures and the students understand concepts of the lesson that would not be easy to describe orally. A biology professor also mentioned the importance of using PowerPoint in teaching both Biology and other science subjects, such as Physics and Chemistry. From her experience, she has noticed that when addressing a younger audience, she needs to make some concepts that may seem complicated in the eyes of students more understandable, so the PowerPoint presentation provides the ability to use shapes and facilitates teaching. A professor of economics and administration typically said "*it is very good for students to see and observe*," thus emphasizing the importance of using supervisory tools in teaching. Supervisory means do not only provide knowledge but complement and enhance teaching (Roblyer, 2008). The findings of the present research, always according to the teachers, show that the use of supervisory means enhances the understanding, interest, and attention of students.

Many teachers also prefer to use the internet in teaching. An economics teacher said he encourages students to use the internet at home to see more concepts and issues related to delivery. Also, a professor of agriculture states that now on the internet there are updated sites with serious work and good exercises. A nursing teacher also sees the internet as an important educational tool but is frustrated by the network's inability to support connection to all classrooms in the school unit where she works. A smaller percentage of teachers use online assignments and interactive whiteboards in their teaching. A professor of economics and administration typically states that recently, when she started using the interactive whiteboard in her teaching, students showed interest, even those who were not activated by some form of traditional teaching. Therefore, as reported in 2006 by De Biasi et al., new forms of technology add content to the theoretical framework of teaching. Judging by the apparent motivation of the students and the willingness to participate, the conclusion is that the use of digital technology in classroom activities has led to more forms of dialogue (Rasmussen & Ludvigsen, 2010; Rubelet al.l, 2017).

In the second part of RQ 2, which deals with the use of educational supervisory tools in the teaching of specialty courses, teachers were asked how many years they have been using new forms of technology in their teaching. First of all, it should be noted that all teachers use educational supervisory means in the teaching of specialty courses and the average answer given was that they have started to incorporate new forms of technology in their teaching in the last 5.5 years. Most teachers even admitted that they did not use new technologies from the beginning of their educational career, but they gradually incorporated it. At first, some were skeptical about the benefits, but then they began to modernize more and more and use technology in their teaching. This is easily understood if we consider that the average length of service of these teachers is 7 years. Typical was the response of a teacher who, while trying to use them, made the following remark: "*here most of them are older than me and do not think that technologies can help with anything. It is purely a matter of the traditional method. Anyway…".* This is a reasonable observation if we consider that the new generations are more familiar with the use of new forms of technology.

The third part of the research question regarded whether there is any other supervisory tool that they have used in their teaching. In addition to what was mentioned in the first question, the majority of teachers answered that they use mainly what was mentioned above. Many of them, although they may not use many forms of new technologies, have been positive and have stated that if they need or are asked by students to use further supervisory means in teaching specialty courses, they are willing to do so. But there have also been answers from teachers who use skype and computers only when necessary, while others are considering incorporating some of the new technologies mentioned in the first question into their teaching in the near future.

RQ 3. The effect of the use of new forms of technology in the educational process

In the third research question, participants answered questions about the results from the use of new forms of technology on the educational process. When asked what effect they think their integration into teaching has, most teachers have claimed it has a positive effect, citing significant benefits that come from using them. Initially, as it is typically stated, they motivate students to seek new knowledge on their own and to become familiar with the use of new forms of technology. In addition, they reduce the teacher preparation time, they make the lesson more understandable and interesting, and they increase the participation of students, helping them develop metacognitive skills and work in groups in a pleasant and creative atmosphere. The results from the use of new forms of technology are in line with research that claims that their use contributes to faster and more effective learning (Seet et al., 2019). There were also teachers who expressed that although their effect is positive, there are cases where they prefer the traditional way of teaching depending on the subject they want to teach. Nevertheless, all participants recognize that the introduction of technology has positive results in the field of education.

Participants were then asked if they believed that the use of new forms of technology in teaching specialty courses would help educators or learners more. Most of the sample answered that both sides can in different ways benefit from their use in teaching. On the one hand, teachers using new forms of technology in the teaching of specialty courses facilitate the organization of the lesson and communication and dialogue with students, and on the other hand, students understand concepts and practices more easily using audiovisual material, which stimulates their interest of the students, is closer to the standards of their generation, and finally turning the lesson into a more familiar one and giving it a fun character. The integration of new forms of technology in teaching facilitates the activity of both teachers and learners (Koutsolia, 2014) and helps to build ideas and organize the way of thinking (Shaffer, 2004).

Finally, they were asked about how the use of new technologies is useful in teaching specialty courses and most teachers answered that it is necessary mainly for teaching specialty courses due to their specialized nature. Specialty courses, as teachers of different specialties emphasized, are more difficult for students to understand and the use of new forms of technology helps students to become familiar with new technologies, but also to access new knowledge, especially in cases where it is not possible. Our research agrees with the results of Seet, Hong, & Chai, (2019), who argue that the use of new forms of technology increases the technological - pedagogical knowledge. Typical answers "*in my own lesson as an agronomist I do not know whether it is possible to take students to a farm, to a nursery, to a flower shop*," "*computer courses nowadays do not mean to be done without*

new technologies," "*new technologies are the beginning of specialization courses*." As Picciano & Seaman (2009) report, new forms of technology increase feedback in education. However, some teachers also refer to the benefits that they themselves have with the use of new technologies in the teaching of specialty courses as it helps them to better organize the material, in less time and to teach it more effectively to students. A small percentage of the sample believe that the use of new forms of technology is equally helpful for both general courses and specialty courses, without considering that their use offers more in the teaching of specialty courses.

4. Discussion

The scope of this survey was to investigate the use of new forms of technology by secondary school teachers in the teaching of specialty courses, in order to assess the extent of the use of new forms of technology in teaching, the results of their use, but also any lack of knowledge about their proper use, both for teachers and for students. It should be emphasized, however, that there was a limitation of the small sample, as the sample comes only from teachers who studied in ASPETE Patras and for this reason; it is not easy to generalize.

With regards to the first research question, our sample not only has a positive attitude towards the use of new forms of technology in the teaching of specialty courses but also seems to understand the benefits that result from their use for both teachers themselves and students as well as the whole educational process. There is no correlation between gender and attitudes towards the new forms of technology since both sexes comment positively and recognize through the examples, they gave the importance of new technologies in teaching. It was observed that teachers who were younger showed more enthusiasm for the use of new forms of technology in their teaching.

Regarding the second research question i.e., the use of new technologies in the teaching of specialty courses, our sample seems to use new forms of technology in teaching especially in recent years at an increasing rate in order to improve the quality and interest of the course, thus facilitating the educational work. Regarding gender, no difference was observed as both men and women use new forms of technology in their teaching. Furthermore, from the answers of the sample, there does not seem to be any difference in gender and age in terms of the effect that teachers believe that the use of new forms of technology has on the teaching of specialty courses since they all answer and document the positive results they observe.

Finally, in the third research question, they seem to realize that through the use of new technologies they benefit themselves and the students both in the smooth outcome of the lesson, as well as in the motivation and increase of the students' interest in their lesson.

It also seems that the level of knowledge for both educators and learners is largely determined by their personal effort and desire to be trained as there is no correspondence between the rapid development of technology and the training received by both educators who are responsible for passing on the knowledge, as well as the trainees who will have to cope successfully with this new data.

Especially nowadays, the messages from the use of technology through the platforms of modern and asynchronous education are encouraging, which on the occasion of the Pandemic created new conditions for learning and supporting education. Technology has become an integral part of everyday life and now steps have been successfully taken in terms of the integration of new forms of technology in the educational process.

References

Ahmadi, M. (2018). The use of technology in English language learning: A literature review. International *Journal of Research in English Education*, 3(2), 115-125.

Armakolas, S. Kazana, A., Mitroulia, M. (2020). Distance Sustainable Education. Incentives and expectations. *Journal of Education, Technology and Computer Science*, 1(31), 9-18. http://dx.doi.org/10.15584/jetacomps.2020.1.1

Armakolas, S., Panagiotakopoulos, C., Fragkoulis, I. (2019). The educational design of the teleconference with the use and utilization of participative - experimental techniques. In *proceedings of 10th International Conference of Open and Distance Learning, 10,* 140-149. http://dx.doi.org/10.12681/icodl.2326

Armakolas, S., Panagiotakopoulos, C., Karatrantou, A. (2018). Teleconference in support autonomous learning. *European Journal of Open, Distance and e-Learning*, 21(2): 27-43.

Bates, T., & Sangra, A. (2011). *Managing Technology in Higher Education: Strategies for Transforming Teaching and Learning*. Jossey – Bass: A Wiley Imprint.

Chapelle, C., & Sauro, S. (2017). The Handbook of technology and second language teaching and learning, Publications John Wiley & Sons.

De Biasi, M., Desisle, R., et al (2006). *CIRCE–Training Program Classical Studies with New Technologies for Europe*. Julian Morgan.

Dillenbourg, P., Järvelä, S., & Fisher, F. (2009). The evolution of research on computer- supported collaborative learning: from design to orchestration. In N. Balacheff, S. Ludvigsen & De Jong, T. Lazonder, A & Barnes, S. (Eds.), *Technology-Enhanced Learning: Principles and Products*. Springer.

Efthimiou, H., Vitsilaki, Ch. (2008). *New forms of learning and the role of technology - The case of teacher education.* Kyriakidis Bros.

Griva, A., Thanopoulos, C., Armakolas, S. (2019a). The pedagogical use of ICT in a School of Engineering in tertiary education. *Innovations and Technologies in Education,* 01(2019): 5-14. ISSN: 2571-2519.

Griva, A., Thanopoulos, C., & Armakolas, S. (2019b). Integrating digital technologies in tertiary education to prepare students for the job market. *Form@re - Open Journal Per La Formazione in Rete,* 19(3), 175-185. https://doi.org/10.13128/form-7719

Headrick, T., & Hall, R. (2013). *Counter-mapping the neighborhood on bicycles: Mobilizing youth to reimagine the city.* Technology, Knowledge and Learning, 18(1-2), 65-93.

Hüttner, A. (2008). *Teaching of technological courses*. Ion Publications.

Januszewski, A., & Molenda, M. (2013). *Educational Technology: A Definition with Commentary*. Routledge - Taylor & Francis Group, New York and London.

Kazana, A., Armakolas, S., Zotos, C. (2019). Participation and motivation in distance learning programs of Geotechnics. *Innovations and Technologies in Education*, *01*(2019): 42-54. ISSN: 2571-2519.

Kesiler, G. (2018). Technology and the future of language teaching. *Foreign language annals,* 51(1), 205-218.

Koutsogiannis, D. (2007). *Utilization of information and communication technologies in the teaching of philological courses and mainly in the teaching of Greek*, Thessaloniki - Greek Language Center (Research on philologists trained in the project Odyssey, 2007).

Koutsolia, M. (2014). The applications of the internet in teaching and learning, Sparta, Thesis, TEI of Peloponnese.

Koutsoukou, P. (2014). Investigation of the perceptions of primary school teachers regarding the didactic utilization of new technologies in the teaching of History, Postgraduate Thesis, University of Patras.

Panagiotakopoulos, C., & Sarris, M. (2016). *Conducting a scientific study using ICTs.* ION Publishers. [In Greek]

Papadiamantopoulou, M., Papadiamantopoulou, C., Armakolas**, S**., Gomatos, L. (2016). Pre-service and in-service teacher training: the use of technology in the Greek educational system. *Proceedings: konference Olympiáda techniky Plzeň 2016.* ISBN 978-80-261-0620-3 Západoĉeská univerzita v Plzni. University of West Bohemia.

Picciano, A., & Seaman, J. (2009). *K-12 Online Learning – A 2008 Follow-up of the Survey of U.S. School District Administrators,* Barson Survey – Research Group, January 2009.

Rahmatova F. (2020). Methods of innovation technologies in primary education, *Архив Научных Публикаций* JSPI, 2020.

Rasmussen, I., Lund, A., & Smørdal, O. (2012). Visualisation of trajectories of participation in a Wiki: A basis for feedback and assessment? *Nordic Journal of Digital Literacy, 1 (*2012), 21–35.

Rassmusen, I., & Ludvigsen, S. (2010). *Learning with computer tools and environments: A sociocultural perspective.* Research Gate.

Roblyer, M. D. (2008). *Integrating educational technology into teaching.* Publications Ellin.

Rubel, L. H., Hall-Wieckert, M., & Lim, V. Y. (2017). Making Space for Place: Mapping Tools and Practices to Teach for Spatial Justice. *Journal of the Learning Sciences, 26*(4), 643-687.

Saettler, P. (2004). *The Evolution of American Educational Technology*. Information Age Publishing.

Saginetou, E. (2019). *The educational techniques and supervisory tools used during teaching in a Public Vocational Training Institute: A case study*. Diploma Thesis, School of Humanities, Hellenic Open University.

Seet, C., Hong, H., & Chai, C. (2019). A Case Study on the Development of Pre-Service Teacher's Design Thinking, A Wide Lens: Combining Embodied, Enactive, Extended, and Embedded Learning in

Collaborative Settings; In *proceedings of 13th International Conference on Computer Supported Collaborative Learning- Conference 2*(815). Retrieved from: https://research.ou.nl/ws/portalfiles/portal/31456037/CSCL_2019_Volume_2.pdf

Shaffer, D. (2004*). Developmental psychology - Childhood and Adolescence.* Publications Ellin.

Verykios, P. (2010). Functional approach to basic mathematical concepts in high school. Doctoral thesis. National and Kapodistrian University of Athens (EKPA).

The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 168-172
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.184

Development of a Learning Model for Large Class Cohorts to Strengthen Learning Outcomes of Students Based on Differentiated Instruction

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Abstract
We propose a new approach to classroom learning based on sequential numeral-division. It builds on the concept of trichotomy – division of students based on creamy-level, middle-level and weaker-level students -- proposed by the present authors. A sequenced series of formative assessments can map student progress and achievement, particularly in the case of weaker students. The idea behind the development of this model is to study if weak students perform better on critical-thinking tests in a collaborative learning setting rather than when they study individually. We propose a mathematical model to measure group activity/achievement, which is a complex function of several parameters. We collect data on different parameters for validation of the model in the near future.

Keywords: Numerical Learning Model, Measurement/Quantification of Learning, Formative Assessment, Large Class Cohorts, Weaker Students, Group Learning

Introduction & Literature Survey

This study proposes a new approach based on sequential numeral-division. The concept of this classification (division and classification are used interchangeably) of the students based on their learning levels/abilities is presented in a very recent paper by the present authors, Muppala, S.P.R., and Chandramohan, B. (2020). This approach targets large class cohorts because the division is more evident. It intertwines formative and summative assessments in equal or unequal numbers that provides an excellent balance between face-to-face sessions and online learning, both self-directed and collaborative with other students (Fallows, S. and Chandramohan, B., 2010) (Muppala, S.P.R., and Chandramohan, B., 2019). Brookfield, S.D. (2017) argues that online learning has a greater advantage as detailed feedback can be given to individual student more than in face-to-face learning. It also helps to identify and offer more support to weaker students. This division in a group learning/flipped classroom was used to create student groups, whose sizes varied from an individual learner to a flexible grouping of no more than

six in a cooperative activity. Such an activity, ideally, allows the students to take responsibility by themselves and builds skills that would enable them to investigate and critically reflect on the given tasks.

A sequence of formative assessments demonstrates progressive achievement, particularly for weaker students to help improve their technical proficiency and improve their module marks. Therefore, development of a flipped learning template is an ideal way to plan, deliver and evaluate this approach. Or, an alternative and effective option is the development of a sequential empirical mathematical model to generate quantitative data to assess the knowledge gains of a student involved in the collaborative learning (Das, B.M., and Sartore-Baldwin, M. L. 2019) (Munir, M.T., Baroutiana, S., Young, B.R. Carter, S., 2018) (Appiah-Twumasi, E., Antwi, V., Anderson, I.E., Sakyi-Hagan, N., 2020), . In this paper, we only present the details of the model and its validation is for a future study. The idea behind the development of this model is to study if the students in a collaborative learning perform better on critical-thinking tests than students who do individually. In other words, it is to map the weaker students' self-knowledge of the academic learning, and to measure it. Literature shows that very little work on this problem. For example, Richardson, J. (2015) says there is no evidence why there is attainment gap between BME (Black and Minority Ethnic) and white students in the UK. To partly answer this question, in an internally funded interdisciplinary project at Kingston University. Hill N. et al. (2016) in their comparative studies based on three module Levels 4 to 6 conclude that understanding attainment gaps is achieved more effectively in large class cohorts and through better inclusive assessment methods; one of them is group assessment. Brookfield, S.D. (2017), p137 says that *working in teams is the norm, so it makes perfect sense for the pedagogy to mirror* working life.

Modelling

We propose a design to measure this group activity that is a complex function of several parameters, see Eq. (1). We will carry out this study at a future date collecting parametric data through a series of questionnaires in term time, during the running of the modules. The first step is to formatively assesses the prior knowledge, ending with the module feedback. This approach is based on research in another area, Combustion, where a flame model **is** proposed, and discussed in Muppala S.P.R. (2005)**:**

$$S_T = S_{L0} + a\, f\left(S_{L0}^{\alpha} \cdot (u')^{\beta} \cdot \alpha^{\gamma}\right)\left(\frac{p}{p_0}\right)^{\delta} \qquad \text{Eq.1}$$

where the turbulent flame speed S_T, or equivalently combustion heat release, is a strong function of flame and turbulent flow quantities.

Here the first term is laminar flame speed S_{L0} that is equivalent to pre-knowledge of the student, K_0 in Eq. (2a). For zero turbulence, the turbulent flame speed S_T is equal to laminar flame speed S_{L0}. Here, S_T is $\equiv$ of learning outcomes (LOs) in group learning (the triple bar notation is equivalent ($\equiv$). It is interesting to note that assuming that the student does not gain any knowledge (because of his/her no contribution or learning or also if the group size is infinite) in the module, s/he still holds her/his pre-knowledge, K_0.

$$K_c = K_0 + a\, f\left(K_0^{\alpha} \cdot e^{\beta} \cdot l^{\gamma}\right)\left(\frac{1}{N-1}\right)^{\delta} \; where 1 < N \le 5 \qquad \text{Eq.2a}$$

where *f* denotes mathematical function. Here, the pre-constant *a* is an adjusting factor as a function of learning environmental constraints. Higher level of degrees of freedom means higher the learning (Liebermann, A., and Miller, L. 2004). Here, K_0 is the previous knowledge of the learner, *e* is a measure of the environment conducive to learning, *l* is the level or amount of information communicated which is given as the product of duration of exposure or communication and rate of communication, among the students in that particular group. *N* is the number of students not exceeding four in a group. The exponential constants come from measured data. Further,

these quantities are the inputs to evaluate the quantity K_c; K_c is a measure of the level of attainment by a learner through problem-based learning (PBL). The maximum value the learner can attain is set to unity. In the modelling, we assume that the knowledge gained by the learner within the group-learning environment cannot exceed the defined cognizance of the leading student (whose K_c is value unity).

In this sequel Eq. (2a), the analytical model is expected to estimate the levels of learning achievements – such as test scores. N=5 is seen 'traditionally' as the optimal value for conducive learning. Hunt, C. (2011), page 52, promotes the advantages of problem-based learning and collaborative projects, Twyman, J.S. and Heward, W.L. (2018) list twelve low-level technology strategies that work in any classroom, especially for group working. Our classroom experience shows N>5 lowers the learning levels. The learning characteristics captured in an abstract way, and the exponents of parameters in Eq. (1a) are evaluated ad hoc firstly from experiments. These parameters are student's previous knowledge in the appropriate subject, learning environment, duration of contact or discussion and level of communication with peers, workload under which s/he works in a particular group and number of students involved. The mathematical relation in the problem-based learning is

$$K_c = K_0 + a\, f\left(K_0^{\alpha} \cdot e^{\beta} \cdot l^{\gamma}\right)\left(\frac{1}{N-1}\right)^{\delta} \; where \; 1 < N \le 5 \qquad \text{Eq. (2b)}$$

By dividing Eq. 1 by K_o yields

$$\frac{K_c}{K_0} = 1 + a\, f\left(K_0^{\alpha-1} \cdot e^{\beta} \cdot l^{\gamma}\right)\left(\frac{1}{N-1}\right)^{\delta} \quad 1 < N \le 5 \qquad \text{Eq. (2c)}$$

The conditions/limits of Eq.2a (or 2b) of the model:

1. It is devised for group learning, and not applicable to an independent learner. That is, for N equals unity, the equation becomes invalid.
2. We believe the model yields more promising results for $1<N \le 5$, and the optimistic for the whole number, N=5 Muppala, S.P.R., and Chandramohan, B. (2020).
3. Mathematically, although the equation Eq.(2a) is still valid for any N value, practically, the quality of learning diminishes for N>5 and thus the equation has little significance for higher N value.
4. From above point, for a hypothetical case $N = \infty$ (infinity), the second complex term becomes zero i.e., K_c becomes $1/(N-1) \sim 1/\infty \sim 0$; i.e. state of no learning.
5. Overall, the intended purpose of this model is to measure the Learning Outcomes (LOs) for all students with transparency, make the quantitative data available to the wider community for future validation purposes (see Twyman, J.S. and Heward, W.L.(2018) for extensive discussion on the policies to address challenges in achieving standardized LOs for all students of all – varied – cognitive skills).

The other basic assumption that governs the development of this model is that the students who participate in collaborative learning perform better on the critical-thinking test than students who do individually.
Normalization of the above relation Eq. (2c) is

$$\frac{K_c}{K_0} = 1 + a\, f\left(K_0^{\alpha-1} \cdot e^{\beta} \cdot t^{\gamma}\right)\left(\frac{1}{N-1}\right)^{\delta} \qquad \text{Eq. (2d)}$$

The normalization of all quantities satisfies dimensional homogeneity of an equation.

Discussion

In the design of this model, we assume that the students are deeply engaged in learning activities and show their dedicated involvement in interacting with the group members. Also, we assume that the learner that is much weaker, in relative terms, to the leading student (LS) benefits more than other students in the group learning. The learner is supposed to have appropriate basic subject knowledge from the pre-university studies. This influence on the learner may be accounted in the exponent δ that is taken to be equal to unity for a group not exceeding five students. We assume that that there is only one leading student within a group who demonstrates a thorough knowledge and understanding of conceptual and applied aspects of that subject. The exponent β varies between 1/4 and 1/3, adopting from the original formulation Eq. (1). This rise in the exponent indicates lowering of the level of connectivity among the group members and hence, the learning outcomes. To obtain comprehensive results, the parameters and exponents in equation 1 should be derivable following detailed interpretation of the data by Hill N. et al. (2016) collected from diverse student cohorts and compared with literature based on BME/non-BME, UK-EU/international, disability/dyslexic students and genders. This interpretation will form the basis of a future study by the authors.

Conclusions

The validation of the proposed model is a challenge for several reasons:

i) It is a novel mathematical approach, and thus requires definite data of various dynamic quantities, pre- and exponential constants to make it a workable model
ii) To the best of the authors' knowledge, there is very little quantitative data available in the literature.

However, on the positive side:

a) the workability in one classroom setting can be extended to a different classroom, or another subject because all measurable quantities are normalized.
b) the findings can be used as a reference for comparative study of new data.

Work in progress: We are currently collecting data for evaluating the proposed model.

We welcome comments and suggestions for improving the model and will gratefully acknowledge such help in future publications.

References

Appiah-Twumasi, E., Antwi, V., Anderson, I.E., Sakyi-Hagan, N. (2020), Comparative effect on Cooperative learning on student's performance in Mechanics concepts: A case of two secondary schools in Berekum Municipality, Ghana. *East African Journal of Education and Social Sciences*. 1(1): p. 139–151.

Brookfield, S.D. (2017) *Becoming a Critically Reflective Teacher*. 2/e. San Francisco, CA. San Francisco, CA. JOSSEY-BASS, A Wiley Brand.

Das, B.M., and Sartore-Baldwin, M. L. (2019) Development of a Logic Model for a Service Learning, Dog Walking Course for College Students. *Evaluation and Program Planning***.** vol 76. Article 101667.

Fallows, S. and Chandramohan, B. (2010) Multiple Approaches to Assessment: Reflections on use of tutor, peer, and self-assessment. *Teaching in Higher Education: Critical Perspectives*. 6(2): pp. 229–246.

Hill, N., Denholm-Price, J., Atkins, N., Dourado, T., Nimoh, L., Nigel, P. (2016) Does group assessment impact BME attainment? *New Directions in the Teaching of Physics*. 11(1). University of Leicester

Muppala, S.P.R., and Chandramohan, B. (2019) A quantitative approach to Problem-Based-Learning based on a Questionnaire: a model for student learning outcomes (a case study), *3rd EuroSoTL Conference*. Bilbao, Spain. pp.693 - 699. ISBN: 978-84-1319-033-4.F

Hunt, C. (2011) *http://hea.ie/assets/uploads/2017/06/National-Strategy-for-Higher-Education-2030.pdf*. (accessed 15 May 2020)

Liebermann, A., and Miller, L. (2004) *Teacher Leadership*. 1/e. Vol. pages 6 – 9. 2004, San Francisco, CA: John-Willey & Sons, Inc.

Munir, M.T., Baroutiana, S., Young, B.R. Carter, S. (2018) Flipped classroom with cooperative learning as a cornerstone. *Education for Chemical Engineers*. 23: p. 25–33.

Muppala, S.P.R., and Chandramohan, B. (2019) A quantative approach to Problem-Based-Learning based on a Questionnaire: a model for student learning outcomes (a case study), *3rd EuroSoTL Conference*. Bilbao, Spain. pp.693 - 699. ISBN: 978-84-1319-033-4.

Muppala S.P.R, Aluri., N.K., Dinkelacker, F., Leipertz, A. (2005) Development of an algebraic reaction rate closure for the numerical calculation of turbulent premixed methane, ethylene, and propane/air flames for pressure up to 1.0 MPa. *Combust. and Flame*. 140: p. 257-266.

Muppala, S.P.R., and Chandramohan, B. (2020) Classroom Research in Large Cohorts: an innovative approach based on questionnaires and Scholarship of Teaching and Learning on Multiple-Intelligences. *Journal of Education and Learning* 9(3). pp106 - 122.

Richardson, J. (2015), The under-attainment of ethnic minority students in UK higher education: what we know and what we don't. *Journal of Further and Higher Education*. 39(2): p. 278 –291.

Twyman, J.S. and Heward, W.L. (2018). How to improve student learning in classroom now. *Inter. J. of Educational Research*. 87(78 – 90).

The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 173-188
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.185

Academist Perceptions on the Use of Web 2.0 Tools Through Maslow's Needs Hierarchy: A Case Study

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Abstract
The theory known as the 'Maslow Hierarchy of Needs', which was put forward by Abraham Maslow as a result of scientific studies, describes the basic requirements that guide human behaviour. In this hierarchical order, needs in five groups are physiological needs, safety needs, belonging and love needs, esteem needs and self-actualisation needs. Nowadays, it is not difficult to observe that human life has undergone a radical metamorphosis with digital transformation. With the cultural transformation triggered by digital technologies in the postmodern world, Maslow's theory has been transformed. In light of all this, in this study, based on Maslow's transforming hierarchy of needs pyramid, it is aimed to reveal academician perceptions about the use of Web 2.0 tools. The study was conducted with a case study, one of the qualitative research methods. A case study is an empirical research method used, where more than one source of evidence or data is available. The study group of the research consists of 20 academicians working in different departments of a government state university. Academist perceptions' interview form for 'Use of Web 2.0 tools through the needs hierarchy of Maslow, which was developed by the researcher as a data collection tool', was used in the research. The relevant form consists of demographic and open-ended questions. As a result, it has been observed that the views obtained from academics generally meet Maslow's Digital Needs Pyramid.

Keywords: Maslow's Needs Hierarchy, Web 2.0 Tools, Academist Perceptions, Case Study

1. Introduction

Digital transformation, in line with the opportunities offered by rapidly developing information and communication technologies and changing social needs, is to provide more effective and more efficient services to organisations and is a holistic transformation in human, business processes and technology elements to ensure beneficiary satisfaction. With digital transformation and the tools of communication technologies, individuals have begun to meet their various needs without time and space limitations (Argin, 2019). As a result of these changes, the classical web structure that came with the internet has been switched to new technologies called Web 2.0. The usage area of Web 2.0 technologies is expanding day by day (Unal and Uzun, 2019). The main reason for this is that Web 2.0 technologies make the interaction between users and web applications, interaction between users, collaborative work and access to information 'very easy' in the internet environment (Jiang, 2014; Chawinga & Zinn, 2016). Vivas and Valencia (2020), in their research, investigated the effects of Web 2.0 tools (blog, wikis,

social networks and multimedia repositories) on academic performance in collaborative learning environments. As a result, it has been demonstrated that Web 2.0 tools are technologies that support collaborative learning in order to develop more professional skills of individuals in the education of the future and to meet the emerging needs in the academic field. As similar research, Torres, Luna, Arciniegas and Faggioni. (2020), in their research, evaluated the issue of collaborative and active learning with Web 2.0 tools applied in Higher Education. As a result, it has been concluded that a strong and effective blended learning model will be created when an appropriate online activity process to be created with Web 2.0 technologies in higher education institutions is combined with face-to-face education.

Known as the Maslow Hierarchy of Needs, the theory put forward by Abraham Maslow as a result of scientific studies describes the basic requirements that guide human behaviour. These requirements fall into five categories: physiological needs, safety needs, belonging and love needs, esteem needs and self-actualisation needs. With the cultural transformation triggered by digital technologies in the post-modern world, Maslow's theory was also rethought. The changes in need perceptions in the social culture transformed with digital technologies are seen in the Maslow 2.0 Digital Needs Hierarchy (Figure 1).

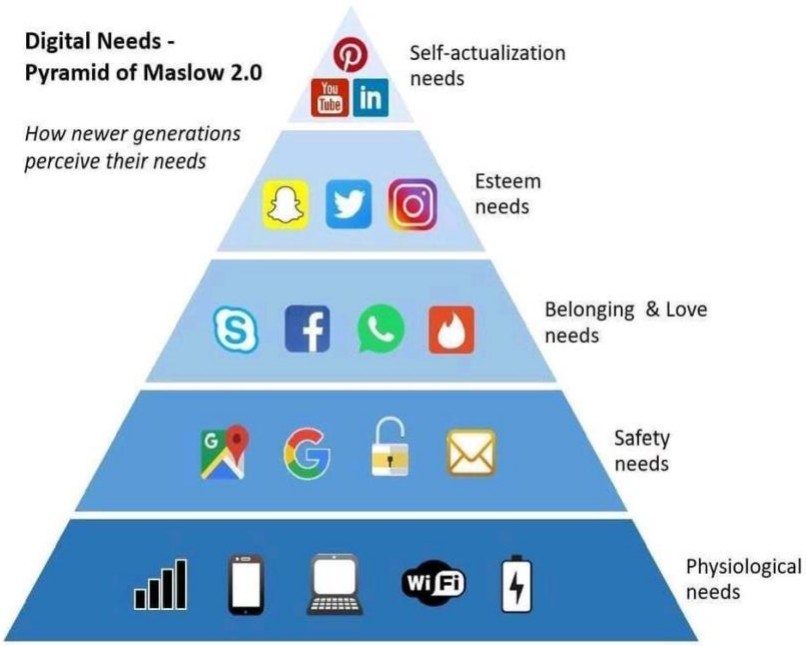

Figure 1: Digital needs pyramid of Maslow 2.0

Physiological needs are seen at the lowest level in Maslow's hierarchy of needs. As a result of the technological developments experienced after the years when the hierarchy of needs was prepared, the world started to globalise rapidly, and many changes were experienced in social life with an increase in the speed of urbanisation. Thus, with the development of technology, changes have occurred (Sahan, 2007). Accordingly, new additions were needed in Maslow's hierarchy model. It was also stated that with the development of technology, new additions should be brought to these steps in the direction of ‘digitalisation’ (Pereira, 2008).

According to Figure 1, Web 2.0 tools were included in the steps of the pyramid draw attention. In this context, the academicians included in the research were asked which Web 2.0 tool they preferred according to the needs in the steps of the pyramid. As a result, the validity of these tools classified according to the needs is also tested.

When the literature is examined within the scope of Maslow's updated digital needs pyramid topic, Yagbasan and Sener (2019) in their studies aimed to determine the motivation of individuals to play online virtual games on the axis of Maslow's hierarchy of needs. As a result of factor analysis, four factors were revealed in the direction of the steps in Maslow's hierarchy, but this was not included because physiological needs were not evident in these virtual environments. Shahrawat and Shahrawat (2017), in their studies, analysed the cultural transition towards

postmodernity or a knowledge society and its impact on the changing needs of cities. As a result, based on the Digital Needs Pyramid of Maslow 2.0, these new needs surface with the increasing ability for people to connect the society and the culture. In the measure that a greater quantity of subjects, understood technologically like natural systems excessively complex and probabilistic, related with other people or institutions using automated means of communication, in these new communicational interactions, new decisions and control decisions for purposes are produced. These processes, which are proper to the postmodern world, require new skills and the increasing satisfaction of new needs to create the bidimensional profile of a digital citizen.

1.1. The aim of the study

In this study, based on Maslow's transforming hierarchy of needs pyramid, it is aimed to reveal academician perceptions about the use of Web 2.0 tools.

1.2. The important of the study

In line with the possibilities offered by rapidly developing information and communication technologies, some changes have been experienced in the needs of individuals and/or societies. There is no doubt that digital transformation plays a big role in these changes. This digitalisation, which affects every field, required the renewal of the theory and institutions in the literature. Maslow put forward one of these theories as the 'Hierarchy of Needs Pyramid'. Since the 1940s, when Maslow prepared this pyramid, the technological changes that took place had an effect on the needs of people, and new additions were needed in the five-level hierarchy model. For example, the new needs of a person have arisen, such as access to the internet and even social media. In this digital transformation, a new structure called 'Maslow 2.0 Digital Needs Pyramid' was created. In addition, the steps of each pyramid of need are classified by the relevant Web 2.0 tools. Although a few articles on different dimensions of this subject were found when the literature was examined, no study has been developed on the validity of this classification and digital need steps. In this study, based on Maslow's transforming hierarchy of needs pyramid, it is aimed to reveal the academician perceptions about the use of Web 2.0 tools. In the study, especially, the perceptions of academicians were drawn attention. The reason for this case is the qualification of academics as an important stakeholder of education, and at this point, it will be the pioneers of change. In the study, it will also be possible to question the academicians' ability to use digital tools. In light of all this, it is foreseen that this study will be an example of the work to be done, especially on digital transformation.

2. Method

An evaluative case study methodology was selected for this study as it enabled the identification of factors which help or hinder the implementation of technology education and make judgements as to their importance at the site studied. Case studies are based on an in-depth investigation of a single individual, group or event to explore the causes of underlying principles (Creswell & Maietta, 2002).

2.1. Study group

The study group of the research consists of 20 academicians working in different departments and different degrees (research assistant and lecturers) of a government state university. Purposeful sampling was used as a sampling method in the study. Purposeful sampling is a technique widely used in qualitative research for the identification and selection of information-rich cases for the most effective use of limited resources (Patton, 2015).

2.2. Data collection tool and collection process

In the study, the open-ended question form developed by the researcher was used to determine academist perceptions on the use of Web 2.0 tools through Maslow's needs hierarchy. A comprehensive literature review was carried out to prepare the relevant questionnaire in a more qualified manner. Then, the questions were re-examined with a language instructor, and the expression disorders were eliminated. Finally, interview questions

were sent to randomly selected five academicians via WhatsApp, and they were asked to say the places that they did not understand while reading the questions. After this feedback, the interview questions were finalised.

The interview questions were grouped under two headings as personal information and questions for the purpose of the research. Within the scope of personal information, the gender, age, faculty and departments, years of work experience, frequency of connecting to the internet and social media were asked to academicians. For the purpose of the research, ask academics which Web 2.0 tool they use according to the needs in the Maslow 2.0 digital needs pyramid, and in this context, questions about whether these tools are effective in meeting their relevant needs are also included. These opinions are classified by researcher as positive and negative opinions at the analysis stage.

2.3. Analysis of Data

The data obtained in the questionnaire created using the Google Forms in the study were analysed with a content analysis technique suitable for qualitative research. Codes were created for the questions answered, the questionnaires were re-evaluated for situations, where there was a difference of opinion and this situation continued until a consensus was reached. In addition, tables were created for each question title, and their codes were written next to them. In addition, direct quotations were made from the statements of academics under the tables.

3. Findings

Information on the demographic characteristics of the study group in the study is given in Table 1.

Table 1. Information on the demographic characteristics of the study group

Variables	Variable level	Frequency (*f*)	Percent (%)
Gender	Male	12	60.0
	Female	8	40.0
Age	25-29	5	25.0
	30-34	6	30.0
	35-39	5	25.0
	40 and over	4	20.0
Faculty	Engineering Faculty	6	30.0
	Education Faculty	5	25.0
	Faculty of Business	5	25.0
	Health Sciences	4	20.0
Department	Construction engineering	3	15.0
	Mechanical engineering	2	10.0
	Biomedical engineering	1	5.0
	Mathematics and Science Education	2	10.0
	Classroom teaching	2	10.0
	Pre-school teaching	1	5.0
	Economics	4	20.0
	Business Administration	1	5.0
	Faculty of Medical	2	10.0
	Faculty of Nursing	1	5.0
	Midwifery	1	5.0

Years of work experience	1-5 years	5	25.0
	6-9 years	5	25.0
	10-14 years	4	20.0
	15-19 years	4	20.0
	20 years and more	2	10.0
Degree	Master degree	11	55.0
	PHD degree	9	45.0
Internet usage frequency	1-2 hours	0	0.0
	3-4 hours	0	0.0
	5-9 hours	10	50.0
	10 hours and more	10	50.0
Social media usage frequency	1-2 hours	2	10.0
	3-4 hours	4	20.0
	5-9 hours	5	25.0
	10 hours and more	9	45.0

According to Table 1, when examining the gender of academician, worked with 12 men and 8 women, academician ages range between 25 and 40. The faculties that academics are affiliated with are Engineering, Education, Business and Health Sciences. The department that academics are Construction Engineering, Mechanical Engineering, Biomedical Engineering, Mathematics and Science Education, Classroom teaching, Pre-school Teaching, Economics, Business Administration, Faculty of Medical and Faculty of Nursing. When the work experiences of academicians are examined, it appears that the frequency varies between 1–5 and 6–9 years. Looking at the academic degrees, it was found that they are mostly in master's degrees. Finally, when academicians' use of the Internet and social media is examined, it is determined that the frequency is 10 hours or more.

In the study, the findings obtained as a result of the analysis of the questions in the second part of the open-ended question form administered online are presented to the academicians in order. The answers to these questions are included in the relevant tables (Tables 2–9).

- **Please write down the Web 2.0 tools you use to realise your self-actualization needs:**

Table 2. Web 2.0 tools for reallising the need for self-actualization

Web 2.0. tools	***f***	***%***
You Tube	20	19.8
Instagram	20	19.8
Facebook	18	16.9
WhatsApp	13	12.2
Twitter	5	4.70
LinkedIn	4	3.76
Blogger	3	2.82
SnapChat	3	2.82
Skype	3	2.82
Google Hangouts	2	1.98
Wikipedia	2	1.98
Pinterest	s2	1.98
Flickr	1	0.94
Total	**94**	**100**

When Table 2 is examined, it has been determined that academics mostly prefer **YouTube** and **Instagram** Web 2.0 tools to realise their self-actualisation needs. In this context, YouTube, which eliminates the habit of watching television, is a platform that appeals to all age groups. Instagram is a free application with a fast, practical, fun and easy interface, and it has a social network feature (Benady, 2015).

These data have been supported the upper step of the Digital Needs Maslow 2.0 pyramid. However, it has been revealed that the Pinterest environment, which finds an environment in this step, is not preferred by academicians to realise this need. When the other rankings of the table are examined, it is seen that tools such as Facebook, WhatsApp and Twitter are effective in realising the need for self-actualization.

- **Please give your opinion that Web 2.0 tools are effective in realising your self-actualization needs:**

Table 3. Web 2.0 tools for realising the need for self-actualization

Categories	**Expressions**	***f***	***%***
Positive opinions	Creativity skills	11	13.6
	Acquire top behavioural skills (digital literacy, digital citizenship, critical thinking, Problem-solving)	10	12.4
	Breaking down the prejudices	9	11.6
	Saving time in accessing information	9	11.6
	Access to information in areas of interest and expertise	8	9.4
	Sharing knowledge in areas of interest and expertise	7	8.6
	Communication skills	5	7.7
	Freedom of thought	3	5.8
	Gaining self-identity	1	1.5
Negative opinions	Spending too much time, business disruption at this point	15	14.8
	Less permanence of easily understood information	1	1.5
	Problems with time management	1	1.5
	Total	**80**	**100**

When Table 3 is examined, it seems that academics have both positive and negative views about Web 2.0 tools they use in the context of self-actualisation. Most repeated expressive is **'creativity skills'** in the context of positive opinions; most repeated expressive in the context of negative opinion is **'spending too much time, business disruption at this point'.**

When direct quotations are examined,

> *'Web 2.0 tools provide the opportunity to handle many tasks in our daily life without wasting time. I can access a lot of information with these tools' (F11).*
>
> *'These tools allow me to express my thoughts freely because they are interactive and allow information sharing' (M5).*
>
> *'I learned more and got rid of my prejudices in many subjects with unlimited access to information' (F2).*
>
> *'I sometimes devote too much time to these tools, in this context my work can be disrupted' (M9).*
>
> *'The information I obtain is not permanent because I can access information from the virtual environment easily' (F7).*

- **Please write down the Web 2.0 tools you use to realise your esteem needs:**

Table 4. Web 2.0 tools for realising the need for esteem

Web 2.0. tools	***f***	***%***
Instagram	19	21.8
Linked in	16	18.3
Twitter	15	17.2
SnapChat	9	10.3
Facebook	7	8.04
Blogger	5	5.74
ResearchGate	5	5.74
Wikipedia	4	4.59
Pinterest	4	4.59
Flickr	3	3.70
Total	**87**	**100**

When Table 4 is examined, it is determined that the Web 2.0 tools used by academics to realise the need for esteem are mostly **Instagram and LinkedIn**. **Twitter** and **Snapchat** followed these tools. These data have been supported this step of the Digital Needs Maslow 2.0 pyramid, but one tool that draws attention in the data obtained in this study was LinkedIn. When the table is examined, it is determined that 16 academics use LinkedIn tool for this need. It is a platform that summarises the careers of LinkedIn members and enables members to share information by influencing each other (Ruff & Frankie, 2019). When this platform is examined today, it is seen that academicians from different parts of different countries benefit from this platform. ResearchGate is a similar Web 2.0 tool and has been preferred by academics for its need for esteem, according to the table.

Please give your opinion that Web 2.0 tools are effective in realising your esteem needs:

Table 5. Web 2.0 tools for realising the need for esteem

Categories	Expressions	*f*	%
Positive opinions	Self-esteem	17	26.5
	Self-confidence	11	17.1
	Achievement	9	14.0
	Self respect	8	12.5
	Motivation	8	12.5
	Perseverance of achievement	4	6.25
	Respect for others	2	3.12
Negative opinions	Misuse and associated negative consequences	3	4.91
	Significantly weakening achievement	2	3.12
	Total	**64**	**100**

When Table 5 is examined, it seems that academics have both positive and negative views about Web 2.0 tools that they use in the context of esteem needs. The most repeated expression for positive opinion is **'self-esteem';** the most repeated expression for negative opinion is **'misuse and associated negative consequences'.**

When direct quotations are examined,

> *'Positive and constructive feedback to came my posts strengthen my motivation and determination to succeed' (M1).*
>
> *'I gain academic prestige with my academic studies I share in media such as LinkedIn ResearchGate, which I use for academic sharing' (F12).*
>
> *'Sharing and exchanging ideas with these tools both increase my self-respect and respect for others' (M4).*

- **Please write down the Web 2.0 tools you use to realise your belonging&love needs:**

Table 6. Web 2.0 tools for realising the need for belonging and love

Web 2.0. tools	***f***	***%***
Facebook	16	19.2
Instagram	13	16.2
WhatsApp	12	15.4
Twitter	9	10.8
Skype	9	10.8
Blogger	5	5.84
Google Hangout	5	5.84
Google Talk	4	4.64
Facetime	3	3.10
Clips	3	3.10
Viber Messenger	1	1.36
Pinterest	1	1.36
Flickr	1	1.36
Total	**73**	**100**

When Table 6 is examined, it is seen that the most used tool by academics to meet their belonging and love needs is **Facebook**, followed by **Instagram** and **WhatsApp**. When Maslow's digital needs pyramid is examined, it is seen that the Web 2.0 tools in this step are Skype, Facebook and WhatsApp. When the table is examined, the tools used are verified. Especially, it has been determined that tools such as **Skype, Google Hangout, Google Talk, Facetime and Clips** are frequently preferred by academics for their belonging and love needs. It is predicted that making video and audio calls and receiving and sending chat messages with these tools are effective in meeting these needs.

- **Please give your opinion that Web 2.0 tools are effective in realising your belonging&love needs:**

Table 7. Web 2.0 tools for realising the need for belonging&love

Categories	**Expressions**	***f***	***%***
Positive opinions	Friendship	13	23.2
	Affinity- social relations (with friends, families, colleague etc.)	11	19.6
	Gaining social identity	8	15.9
	A feeling of belonging to a group	5	8.92
	Gaining social status	5	8.92
	Acceptance by a group or people	4	7.14
	To love / be loved	2	3.57

Negative opinions	Fake relationships established in virtual environments	4	7.14
	Sharing negativities between people in these environments gives a feeling of insecurity to people near us	2	3.57
	Distrust from fake relationships	2	3.57
	Total	**56**	**100**

When Table 7 is examined, it seems that academics have both positive and negative views about Web 2.0 tools they use in the context of belonging and love needs. The most repeated expression for positive opinion is **'friendship'**; the most repeated expression for negative opinion is '**fake relationships established in virtual environments'.**

When direct quotations are examined,

'Via to these tools, I often feel that my family and social relationship ties are strengthened'(F8).

'Via to these tools, I feel myself belonging to an academic group with the communication I have established with my academic environment. In this context, I gain social identity' (M6).

'I feeling to loved with the communication I establish with these tools, this situation affects positively on my daily life' (F9).

'These tools sometimes make us feel the negative events experienced between our own family or people in our social environment closely. This situation increases my distrust of my relatives and people around me' (M17).

- **Please write down the Web 2.0 tools you use to realise your safety needs:**

Table 8. Web 2.0 tools for realising the need for safety

Web 2.0. Tools	***f***	***%***
Google Drive	17	21.7
Gmail	17	21.7
Google Maps	10	13.4
Hotmail	8	10.2
Outlook	8	10.2
One Drive	7	8.97
Dropbox	5	6.41
Apple iCloud	3	3.84
Google Earth	2	2.56
Yandex Navigation	1	1.28
Total	**78**	**100**

When Table 8 is examined, it is seen that the most common tools used by academics to meet their safety needs are **Gmail and Google Drive.** Google Drive is a file storage and synchronisation service created and managed by Google. This service enables users to store documents, share files and organise documents with their collaborators (Ouick & Choo, 2014). Gmail is a free e-mail service offered by Google. It has been determined that e-mail environments such as **Hotmail and Outlook** and those OneDrive, Dropbox and Apple iCloud are preferred by

academicians to meet the safety needs. It is predicted that academicians prefer these tools for information and data security.

When Table 8 is examined, it has been determined that other Web 2.0 tools used to meet the safety need are Map and Navigation Applications (Google Maps, Google Earth and Yandex Navigation). Besides in the light of all these data, the results obtained support the Web 2.0 tools used in the safety needs a step of Maslow's Digital Needs Pyramid.

- **Please give your opinion that Web 2.0 tools are effective in realising your safety needs:**

Table 9. Web 2.0 tools for realizing the need for safety

Categories	Expressions	f	%
Positive opinions	Data safety-backup	20	50.0
	Information safety	8	20.0
	Easy and fast communication	3	7.50
Negative opinions	Cybersecurity concerns	7	17.5
	Network security concerns	2	5.00
	Total	**40**	**100**

When Table 9 is examined, it seems that academics have both positive and negative views about Web 2.0 tools they use in the context of belonging and love needs. The most repeated expression for positive opinion is **'Data safety—Backup'**; the most repeated expression for negative opinion is **'Cybersecurity concerns'**.

When direct quotations are examined,

> *'Via to tools such as Google Drive, Dropbox, I make backups and ensure data security'; so that I feel safe (F1).*
>
> *'I do not experience data loss using tools with data storage features. I can easily access my data, especially in environments where I do not have a computer; so I save time' (M7).*
>
> *'I question the security of the e-mails I send or receive via e-mail tools such as Gmail and Hotmail; I am concerned about cybersecurity' (M4).*

Please write down the Web 2.0 tools you use to realise your physiological needs:

Table 10. Web 2.0 tools for realising the need for physiological

Mobile and Web 2.0. Tools	F	%
Smartphones	20	18.6
Personal computers	15	14.0
Gmail	13	12.1
Hotmail	11	10.2
Google Chrome	10	9.34
Tablets	8	7.47
Hotmail	7	6.54
Online shopping sites	7	6.54
Skype	5	4.67
WhatssApp	4	4.02
Facetime	3	2.80
WiFi-connection	2	1.86
Wired connection	2	1.86
Total	**107**	**100**

When Table 10 is examined, it has been determined that the tools used by academics to meet their psychological needs are mostly mobile devices**: 'Smart Phones'** and **'Personal Computers'**. According to the table, it is seen that other tools can vary such as **e-mail services, web browser tools, online shopping sites** and so on.

When Maslow's digital needs pyramid is examined, it is seen that there are tools such as WiFi, tablet, personal computers and batteries in the psychological needs level. The results obtained from academics support these tools used.

Table 11. Web 2.0 tools for realising the need for physiological

Categories	Expressions	f	%
Positive opinions	Make phone call	20	25.3
	Send or take e-mail/electronic documents	12	15.1
	Web browser & search	11	13.9
	Buy online shopping	7	8.86
	E-commerce	5	6.32
	Video or voice conversation-communication	4	5.06
Negative opinions	Phone and internet addiction	10	12.6
	Asociality- inability to socialise	9	11.6
	Message addiction	1	1.26
	Total	**79**	**100**

When Table 11is examined, it seems that academics have both positive and negative views about Web 2.0 tools they use in the context of psychological needs. The most repeated expression for positive opinion is **'make phone call'**; the most repeated expression for negative opinion is **'phone and Internet addiction'**.

When direct quotations are examined,

> *'I can meet my basic physiological need to communicate using my smart phone; when my device is not with me I feel insecure and panic (M11)'.*
>
> *'Especially since I could not leave the house during the period that started with the pandemic process, I did my shopping through online sites; this situation relaxed me psychologically (F5)'.*
>
> *'The time I spend with my smartphone exceeds 8 hours a day; which makes me both phone and internet-addicted (M3)'.*
>
> *'I care the applications on my phone during the day and break my social ties with my environment, which makes me nerdy (M13)'.*
>
> *'I think that the needs in this area cannot be met sufficiently and healthily through web tools, socialising is one of our most basic needs in the physical sense, and psychological needs met with web tools cannot be realistic enough (F7)'.*

4. Result, discussion and suggestion

The theory, known as the Maslow Hierarchy of Needs, put forward by Abraham Maslow as a result of scientific studies, describes the basic needs that guide human behaviour. These needs are grouped into five groups: physiological, safety, love and belonging, esteem and self-actualisation. With the cultural transformation triggered by digital technologies in the postmodern world, Maslow's theory was also rethought. Although the names of the needs perceptions transformed by digital technologies have not changed, their situations of satisfaction have been renewed. This renewal has enabled Web 2.0 tools to take place in the steps of the pyramid (Bridgman, Cumming & Ballard, 2020).

In this study based on Maslow's transforming hierarchy of needs pyramid, it is aimed to reveal the academician perceptions about the use of Web 2.0 tools. In this digital transformation, a new structure called 'Maslow 2.0 Digital Needs Pyramid' was created. In addition, the steps of each pyramid of need are classified by the relevant Web 2.0 tools. Although a few articles on different dimensions of this subject were found when the literature was examined, no study has been developed on the validity of this classification and digital need steps. In this study based on Maslow's transforming hierarchy of needs pyramid, it is aimed to reveal academician perceptions about the use of Web 2.0 tools. In the study, especially, the perceptions of academicians were drawn attention. The reason for this case is the qualification of academics as an important stakeholder of education and at this point, it will be the pioneers of change. In the study, it will also be possible to question the academicians' ability to use digital tools. In light of all this, it is foreseen that this study will be an example of the work to be done, especially on digital transformation.

Research is an example of a case study from the qualitative research methods. The case studies are based on an in-depth investigation of a single individual, group or event to explore the causes of underlying principles (Creswell & Maietta, 2002). In the study, the open-ended question form developed by the researcher was used to determine the academist perceptions on the use of Web 2.0 tools through Maslow's needs hierarchy. Three field experts, one psychological counsellor and one assessment and evaluation specialist were consulted to test whether the relevant interview form served the purpose. The interview form was applied to 20 academicians working in different departments of a state university. The opinions obtained from academics and a comparative literature review are presented as follows:

First of all, when the academician use of the internet and social networks is examined, it is noteworthy that the frequency is 10 hours or more. When the literature on this subject is examined, Yayli, Ozturk and Alabay (2013) did research that determines Turkish Academician's level of internet use; as a result, academicians use the internet every day for academic research. Guler and Mutlu (2013) investigated the level of social networks' usage of academic staff in their studies, and as a result, it has been revealed that the frequency of academicians spending time on social networks is high. So that the findings of the research were supported by the literature review.

It has been determined that academics mostly prefer 'YouTube' and 'Instagram' Web 2.0 tools to realise their self-actualisation needs. These data have been supported the upper step of the digital needs Maslow 2.0 pyramid. However, it has been revealed that the Pinterest environment, which finds an environment in this step, is not preferred by academicians to realise this need. When the other rankings of the table are examined, it is seen that tools such as Facebook, WhatsApp and Twitter are effective in realising the need for self-actualisation. When the field literature is examined, Alexa (2011) reported that YouTube, an internet social media and video viewing site, ranks third in the world for the volume of video traffic and enjoys a larger audience of 18–24 years olds than other internet sites. The use of the social network Instagram, as an innovative tool for debate and collaborative mobile learning, aims to reinforce the development of certain skills and abilities among the students of different subjects of different universities, through the promotion of creativity and the management of ICTs (Miguel et al., 2020). It seems that academics have both positive and negative views about Web 2.0 tools they use in the context of self-actualisation. Most repeated expressive is 'creativity skills' in the context of positive opinions; most repeated expressive in the context of negative opinion is 'spending too much time, business disruption at this point'. An answer quoted from academics; 'I have a channel on food making on YouTube, which improves my creativity and technology skills (F4)'. However, as a disadvantage, the loss of time has been shown as a lot of time is spent in these tools. According to the research by Jeffred et al. (2003), half of the people's time is spent on media consumption. With the technological opportunities that it offers today, the media also has its eyes on the leisure time of adults (Hodge et al., 2012).

It is determined that the Web 2.0 tools used by academics to realise the need for esteem are mostly Instagram and LinkedIn. Twitter and Snapchat followed these tools. These data have been supported this step of the digital needs Maslow 2.0 pyramid, but one tool that draws attention in the data obtained in this study was LinkedIn. LinkedIn allows employees, entrepreneurs and companies to establish business connections, based on the philosophy. 'One's professional relationships are the key to person success' (Kudug, 2011). Erdem, Kocadere and Soylu (2017), in their studies, analysed the reasons for using social networks according to Maslow's Hierarchy of Needs. As a result, it has been revealed that users prefer Twitter to meet their esteem needs. Based on Maslow's need to be respected in the hierarchy of needs, it is possible to say that the individual gains a place for himself through social media, feels belonging to a group or community and is esteemed in the socialisation process he performs in this way (Unur, 2016). The other result is that academics have both positive and negative views about Web 2.0 tools they use in the context of esteem needs . The most repeated expression for positive opinion is 'self-esteem'; the most repeated expression for negative opinion is 'misuse and associated negative consequences'. An answer quoted from academics is 'I gain academic prestige with my academic studies I share in media such as LinkedIn ResearchGate, which I use for academic sharing' (F12). 'Especially the criticism and even insults to the message of with social content posts I post on Twitter negatively affect my psychology' (M13).

It is seen that the most used tool by academics to meet their belonging and love needs is Facebook, followed by Facebook, Instagram and WhatsApp. When Maslow's digital needs pyramid is examined, it is seen that the Web 2.0 tools in this step are Skype, Facebook and WhatsApp. Especially, it has been determined that tools such as Skype, Google Hangout, Google Talk, Facetime and Clips are frequently preferred by academics for their belonging and love needs. It seems that academics have both positive and negative views about Web 2.0 tools they use in the context of belonging and love needs. The most repeated expression for positive opinion is 'friendship'; the most repeated expression for negative opinion is 'fake relationships established in virtual environments'. The individual, who creates a profile in social media such as Facebook and Twitter, constructs his own identity in this way and is the first step towards meeting the need to belong to a group beats. After this stage, the individual goes to reinforce the sense of belonging by joining social sites (Alaton, 2012). An answer quoted from academics: 'Via

to these tools, I feel myself belonging to an academic group with the communication I have established with my academic environment. In this context, I gain social identity' (M6).

It is seen that the most common tools used by academics to meet their safety needs are Gmail and Google Drive. It has been determined that e-mail environments such as Hotmail and Outlook and those One Drive, Dropbox and Apple iCloud are preferred by academicians to meet the safety needs. It is predicted that academicians prefer these tools for information and data security. Other Web 2.0 tools used to meet the safety need are Map and Navigation Applications (Google Maps, Google Earth and Yandex Navigation). Besides in light of all these data, the results obtained support the Web 2.0 tools used in the safety needs step of Maslow's Digital Needs Pyramid. It seems that academics have both positive and negative views about Web 2.0 tools they use in the context of belonging and love needs. The most repeated expression for positive opinion is 'Data safety-Backup'; the most repeated expression for negative opinion is 'Cybersecurity concerns'.

It has been determined that the tools used by academics to meet their psychological needs are mostly mobile devices: 'Smart Phones' and 'Personal Computers'. According to the table, it is seen other tools vary such as e-mail services, web browser tools, online shopping sites and so on. When Maslow's digital needs pyramid is examined, it is seen that there are tools such as WiFi, tablet, personal computers and batteries in the psychological needs level. The results obtained from academics support these tools used. It seems that academics have both positive and negative views about Web 2.0 tools they use in the context of psychological needs. The most repeated expression for positive opinion is 'make phone call'; the most repeated expression for negative opinion is 'phone and Internet addiction'. When the field literature is examined with social media, where interaction and sharing are the central feature, the physical, sociological, psychological and economic boundaries have changed, and a brand new structure has emerged, in which localism and globalism exist simultaneously (Laughey, 2010).

Based on the results of the research, the following recommendations are presented:

• This research was conducted with a case study of qualitative research methods, and further studies can be realised with different research methods of quantitative research.

• The sample of the research is faculty members (academicians) from different branches in higher education, further studies can be realised with different sample groups and different stages.

• The interview form was used as a data collection tool in the research. Further studies can be realised with a valid and reliable scale or questionnaire. Hence, detailed and comparative results can be produced.

References

Alaton, D. (2012). Gencler, Teknoloji ve Degisen Sosyal Dengeler. Retrieved September 04, 2020, from http://www.ekipnormarazon.com/makaleler/14-digerleri/144-alaton-gencler-teknolojidegisen-sosyal-dengeler.

Alexa. (2011). About You Tube. Retrieved September 02, 2020, from http://www.alexa.com/siteinfo/youtube.com#

Argın, E. (2019). Z Kusaginin Sosyal Medya Bagimliligi ve Narsist Egilimler: Elazig Ili Ornegi. *Avrasya Sosyal ve Ekonomi Arastirmalari Dergisi, 6*(6), 166–183. Retrieved from https://dergipark.org.tr/tr/pub/asead/issue/47256/595415.

Benady, D. (2015). Media: Instagram steps up advertising offensive. *Campaign, 1*(16), 52. Retrieved from https://www.campaignlive.co.uk/article/instagram-steps-advertising-offensive/1328970.

Bridgman, T., Cummings, S. & Ballard, J. (2020). Who built Maslow's pyramid? A history of the creation of management studies' most famous symbol and its implications for management education. *Academy of Management Learning & Education*, 81–98. doi:10.5465/amle.2017.0351

Chawing, W., D. & Zinn, S. (2020). Use of Web 2.0 by students in the Faculty of Information Science and Communications at Mzuzu University, Malawi. *South African Journal of Information Management,* 1865–2078. doi: 10.4102/sajim.v18i1.694

Creswell, J. W. & Maietta, R. C. (2002). *Qualitative research.* In D. C. Miller & N. J. Salkind (Eds.), *Handbook of research design & social*.

Erdem, M., Kocadere, S. A. & Soylu, M. Y. (2017). *Sosyal Ag Kullanim Nedenleri Maslow'un Ihtiyaclar Hiyerarsisiyle Aciklanabilir mi?* Conference: 11. Uluslararasi Bilgisayar ve Ogretim Teknolojileri Sempozyumu (ICITS), Malatya, Turkey.

Guler, E. & Mutlu, M., E. (2013). Akademik personelin akademik sosyal aglari kullanim duzeyi: Anadolu Universitesi ornegi. *Journal of Research in Education and Teaching, 2*(2), 72–77.

Hodge, C. J., Zabriskie, R. B., Fellingham, G., Coyne, S., Lundberg, N. R., Padilla-Walker, L. M. & Day, R. D. (2012). The relationship between media in the home and family functioning in context of leisure. *Journal of Leisure Research,* 285–307.

Jeffrey, L. M., Kinshuk Atkins, C., Laurs, A., & Mann, S. (2006). *e- Learning profiles: diversity in learning*. Auckland, New Zealand: Massey University.

Jiang, D. (2014). What will Web 3.0 bring to education? *World Journal on Educational Technology, 6*(2), 126-131. Retrieved from September 02, 2020, http://archives.un-pub.eu/index.php/wjet/article/view/2782

Kudug, H. (2011). *Sosyal Ag Analizi Olcutlerinin Is Aglarina Uyarlanmasi* (Master Thesis). Ege University, Institute of Science, Izmir, Turkey.

Laughey, D. (2010). Medya Calismaları: Teoriler ve Yaklasimlar (Ali Toprak, çev.). Istanbul, Turkey: Kalkedon Yayinlari.

Miguel, R. S., Javier, F., Gomez, R., Ariadna, L., Becerra, H. & Espinosa, M. (2020). *Use of Instagram as a tool for debate and learning*. 15th Iberian Conference on Information Systems and Technologies (CISTI) Information Systems and Technologies (CISTI), 2020 15th Iberian Conference on.

Patton, M. Q. (2015). *Qualitative research & evaluation methods: integrating theory and practice* (4th ed.). Thousand Oaks, CA: Sage.

Pereira, F. (2008). *Maslow's Hierarchy of needs and ICT: challenges of end-user adoption of digital life*. 47th European Congress of FITCE, London, United Kingdom, September 23, 2008.

Ruff, L. & Frankie, J. (2019). *Linkedin*. London, UK: Product Marketing Lead.

Shahrawat, A. & Shahrawat, R. (2017). Application of Maslow's hierarchy of needs in a historical context: case studies of four prominent figures. *Psychology, 8*, 939–954. doi:10.4236/psych.2017.87061

Sahan, H. (2007). *Universite Ogrencilerinin Sosyallesme Surecinde Spor Aktivitelerinin Rolu* (PhD Thesis). Selcuk University, Konya. Retrieved from https://dergipark.org.tr/tr/pub/kmusekad/issue/10221/125647

Quick, D. & Choo, K. K. (2014). Impacts of increasing volume of digital forensic data: a survey and future research Challenges. *Digital Investigation, 11*(4). doi:10.1016/j.diin.2014.09.002

Tasci, B. & Ekiz, S. (2018). *'Serbest Zaman Aktivitesi Olarak Sosyal Medya Bagimliligi'* (pp. 224–235). 2. Uluslararası Iletisimde Yeni Yonelimler Konferansi: Eglence ve Urun Yerleştirme. Retrieved from https://hdl.handle.net/11467/1902.

Torres, J., Luna, U. G., Arciniegas, A. M. & Faggioni, V. S. (2020). Collaborative and active learning through Web 2.0 tools applied in higher education. *Revista de Comunicación Vivat Academia, 117*(1), 116–121. **doi:**10.15178/va.2011.117E.116-121

Unur, E. (2016). Geleneksel Medya'nın Sosyal Medyayi Nasil Kullandigina Iliskin bir Inceleme: Dizilerin Twitter Kullanımı. *Turkiye Sosyal Arastırmalar Dergisi, 20*(1), 153–170. doi:10.20296/tsad.24436.

Unal, E. and Uzun, A., M.(2019). Using Web 2.0 technologies to support teacher candidates' content development skills. *Cypriot Journal of Educational Sciences 14* (4), 694-705. https://doi.org/10.18844/cjes.v11i4.3737

Vivas, G. & Valencia, M. (2020). *Web tools 2.0 and its influence on academic performance in collaborative learning environments: an empirical study*. 2020 15th Iberian Conference on Information Systems and Technologies (CISTI) Information Systems and Technologies (CISTI), 2020 15th Iberian Conference on. 1–4 Jun, 2020.

Yagbasan, M. & Sener, Y. (2019). Ihtiyaclar Hiyerarsisi Ekseninde Cevrimici Sanal Oyunlarin demografik Degiskenler Acisindan Karsilastirmali Analizi. *Karadeniz Iletisim Arastirmalari Dergisi, 2*, 138–160. Retrieved from https://dergipark.org.tr/en/pub/e-kiad/issue/51167/656612

Yayli, A., Ozturk, A. & Alabay, M. N. (2013). A research to determine Turkish Academician's level of Internet use. *Gazi University Journal of Commerce and Tourism Education Faculty, 2*, 259–277.

The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 188-198
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.186

Effects of Problem Based Learning Method and Lecture Teaching Method on Academic Achievement of Students

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Abstract
The research examined the effects of Problem Based Learning (PBL) and Lecture teaching method (LTM) on students' achievement in agriculture subject. This research was necessitated by consistent poor performance of students in agriculture subject in the national examination, Kenya Certificate of Secondary Education (KCSE). The aim was to determine and compare the achievement of students in PBL and LTM. Quasi-Experimental design, following a Non-equivalent Control Group Pre-test-Post-test was adopted. PBL was the treatment, while LTM group was control. All the students of agriculture and teachers of agriculture formed the target population. Stratified random sampling was used to sample 12 schools. Six schools were subjected to PBL while the other six schools followed LTM. The sample size was 484 Form Two agriculture students and 12 teachers of agriculture. Data were collected through agriculture achievement test. Descriptive statistics and analysis of covariance (ANCOVA) was used to analyse the data. The results established that PBL has the greatest potential in improving students' achievement in agriculture compared with LTM. The PBL method significantly ($p<.05$) improved the student performance in agriculture. A statistically significant difference was found between students of PBL and LTM. The effects of PBL were more noticeable, therefore, the results are robust enough to inform practicing teachers to adopt PBL method because it has demonstrated its effectiveness in delivering content. The results may inform education experts at tertiary institutions and universities in Kenya on the benefits of implementing PBL method to pre-service teachers.

Keywords: Problem Based Learning, Lecture Teaching Method, Poor Performance, Agriculture Achievement Test, Students Achievement

1. Introduction

1.1 Introduction to the Problem

Agriculture is one of the sectors that contribute to eradication of poverty, hunger and malnutrition and by extension promotion of sustainable development. Equally, the sector is central to unlocking new developments in the various

fields of science, technology, innovations and entrepreneurships. Notably, economic growth resulting from agriculture has played significant roles in poverty eradication which has led to tremendous economic growth in both Latin America and several Asian countries. However, the action plan used in these countries have not functioned well in Africa (Diao & Yanoma, 2003). This is due to poor implementation of strategies geared towards agricultural revolution, as well as, falling behind in factor productivity in African agriculture compared to other global economies.

In Kenya, agriculture is the mainstay of the economy contributing about 60 percent of the Gross Domestic Product, as well as, offering direct and indirect employment to millions. However, the full potential of the subject has not been unlocked in the whole country. In Ndhiwa Sub-County of Homa Bay County in the Republic of Kenya, the dismal performance of students in the agriculture subject in the national examination at Kenya Certificate of Secondary Education (KCSE) has been generally unsatisfactory (Kenya National Examination Council, 2016); a trend that points to some theories whose veracity this paper investigated in-depth. Educators to some extent have established that students learning outcomes are determined by a myriad of intertwined factors interacting with each other. The factors include school-based factors, social factors as well as, economic factors. The underlying circumstances in which these factors interact may be the cause of poor performance of students in Ndhiwa Sub County. Substantive studies have pointed out that poor results in agriculture subject in Kenya could possibly be associated to teaching methodology that absolutely fail to stimulate retention of knowledge and gaining of practical competence.

The study adopted Constructivist Learning Theory which combines Cognitive Development Theory, Piaget (1972) and Sociocultural Theory, Vygotsky (1978). Piaget's theory sees the teacher as a facilitator or a guide who provides a rich environment for students to explore their inquisitiveness. Therefore, the teacher should desist from answering students' questions. Vygotsky's theory emphasized that teachers' responsibility is to make sure that students are active in constructing their own knowledge through social interactions. The active role of the student is useful in building understanding, asking questions and appropriate use of information.

It is worth noting that PBL teaching method is not used in Kenya secondary schools as one of the teaching methods, therefore, research findings would be useful in informing teachers and education managers to utilize PBL as a teaching method to improve student's achievement in agriculture in schools within Ndhiwa Sub County. This would make education administrators within the Sub County to take corrective measures aimed at improving students learning outcomes in agriculture subject. Teachers, likewise, would also benefit from the findings by implementing the use of PBL which eventually would lead to improved academic achievement of students.

The Kenya National Examination Council (2016) has reliably reported that performance of students in agriculture subject has been increasingly poor over the years in the Kenya Certificate of Secondary Education (KCSE). Actually, national performance in the subject has always remained below 50% (KNEC, 2016). It is regrettable that the unsatisfactory achievement in the subject has persisted despite availability of numerous learning platforms, such as agriculture lessons, Young Farmers Clubs and school farms. Indeed, this unfortunate situation is attributable to a combination of a series of factors, which includes but not limited to teaching methods. From this perspective, it was imperative to find methods of teaching that may help increase students achievement as a whole. Therefore, PBL method, being an active teaching method, was included in the research because its usage has proved productive in refining and enhancing students' achievements. A number of studies have been done in Kenya investigating the connection and apparent linkage between students achievement and teaching methods in a variety of subjects. Nevertheless, there are insufficient studies, if any that have examined the relationship between PBL as a teaching method and students' achievement in agriculture subject in secondary schools in Kenya. Therefore, the research was carried out in Ndhiwa Sub County because the achievement of students in this Sub County has persistently remained poor.

In recognition of the fact that teaching using predominantly lecture method promotes lower students achievement in agriculture, Kenya National Examinations Council (KNEC, 2013) volunteered practical advice to teachers of agriculture to take advantage of methods of instruction that support students to acquire practical knowledge in conjunction with preservation of what has been learnt. From this perspective, it was acknowledged that active

methods of instruction are effective in providing assistance to students in solving problems (Kibett, 2002). In a separate report, teachers of agriculture were called upon to infuse readership culture to empower students to develop clear understanding of the principles and practical applications used in agricultural production (KNEC, 2013). It is within this context that PBL which is an active instructional method was applied to strengthen students' achievement in agriculture subject. Nationally, the general performance index of students in agriculture subject has been ordinarily inadequate as pointed out by Kenya National Examinations Council (2016) report. The unsatisfactory performance is to a large extent associated to instructional procedures, as well as, other factors not investigated in this research. The use of PBL may help in improving students' achievement. This research in particular has endeavoured to identify suitable method that may support efficient and valid learning between students, subsequently, strengthening students' interactions, as well as, increasing students learning outcomes in the subject. In the past, there has never been particular research carried out on the effectiveness of PBL in secondary school agriculture in Ndhiwa Sub County. Therefore, this research had the intention of filling this knowledge gap. The research provides reliable practical evidence on the effects of PBL on students' achievement in secondary school agriculture.

Impressive academic results are an outright indication of excellent establishment of good teaching practices. For this reason, the good results are a prerequisite for supporting faster social and economic development. The economic and social progress must be anchored on quality education, which regulates the growth of human resources required for quick advancement in a country. In this regard, Akanle, (2007) demonstrated that capital investment in education frequently influence societal and economic growth. To attain this high level of development, teaching personnel should be prepared to employ dynamic teaching strategies that may foster achievement of satisfactory performance. For this reason, classification of teaching methods fall into two general groups, specifically, expository, as well as, heuristic methods.

The expository method involves direct instructional strategy which encompasses use of lectures. Interpretation and understanding of educational aims coupled with knowledge of students' needs is key for effective teaching. According to Cascio (2015) accurate translation of educational aims and objectives often results in good teaching, as such, discovering significant factors that have serious implications on students' performance at any education level by the teachers becomes an easy task. In another research, Charlton (2006) observed that giving instruction using lectures predominantly supports the delivery of information in a unilateral way. In many instances, there is less participation of learners. The process effectively renders students to transform themselves into inactive and unresponsive listeners (Marmah, 2014). Productive and efficient use of lectures is only viable if teachers supplement its usage with interactive instructional practices that could reduce the deficiencies and weaknesses associated with the use of lectures, for example, limited retention of knowledge, creating inappropriate environment where students are inactive and reducing exploitation of cognitive activities in students (Fry et al., 2009). Lecture teaching method has been associated by reduced action by students; essentially, this scenario promotes cramming which theoretically forms the basis for learning (Wachanga & Mwangi, 2004).

Similar studies have documented that using methods that do not inspire creativity in students in most situations produces poor students' outcomes in examinations, this state of affairs have been typically observed in various subjects (Adunola, 2011). In the light of this confirmation, Auwal (2013) prominently pointed out that excessive dependence on teaching techniques that are teacher-centered make cramming as the main method of learning which is characterised by repetitions and replication of facts culminating into rote learning. Notably, the outcome of such methods of teaching leads to poor academic performance in science subjects as observed in Nigeria. In acknowledging the significance of teaching using methods that are student centered, Auwal (2013) impressively cited (Achor et al., 2009), candidly emphasized the importance of using didactical methods that stimulate participation of students, at the same time, underscore the need for knowledge retention.

Problem Based Learning is a teaching method where applicable real-life problems emanating from the students syllabus are presented in the initial phase of teaching sequence. The problems supply the background and incentive for the acquisition of knowledge thereafter (Michael, 2004). Therefore, students must be actively involved through collaborative engagement amongst themselves for self-directed learning to occur (Michael, 2004). For this reason, PBL provides an opportunity for learners to completely benefit from the interaction amongst the students as they

tackle the learning issues. This productive engagement of learners places PBL as a method that uses problems as the primary focus for student learning (Khairiree & Kurusatian, 2009). Accordingly, PBL has emerged as one of the most powerful instructional method with the potential to allow for dramatic mainstreaming of innovative ideas resulting into attainment of skills vital in finding solutions to problems (Hmelo-Silver, 2004). Against this background, (Mabrouk, 2007) gave evidence suggesting that PBL have a great potential in improving students learning outcomes. This was demonstrated in some topics in analytical chemistry and biochemistry. Similarly, Abanikannda (2016) research established that learning performances of students' greatly improved under PBL method in chemistry in comparison to lecture teaching method. In a similar fashion, (Shikuku & Amadalo, 2015) research on linear programming skills in Kenya, concluded that PBL students posted impressive results in mathematics as they were selectively compared to students that received instruction through lectures.

1.2 Objective of the Study

The aim of the research was to determine and compare the effects of Problem Based Learning and Lecture Teaching method on students' achievement in secondary school agriculture subject.

1.3 Hypothesis of the Study

The null hypothesis was tested at significance alpha level of .05. The hypothesis was stated as;
H0: There is no statistically significant difference in achievement in agriculture between students taught through PBL and those exposed to lecture teaching method.

2. Methodology

The research adopted Quasi-Experimental Design, which followed Non-equivalent Control Group Pre-test-Post-test Design (Campbell & Stanley, 1963). Quasi-experimental was applied because it was impossible to carry out true experiment on human beings. Non-equivalent Control Group Pre-test-Post-test Design was considered vigorous and powerful design popularly used in educational research (Ary et al., 2010). Moreover, the design proved appropriate for testing and confirming the precise effects of PBL method and the classes remained intact during the research (Borg & Gall, 1989; Fraenkel & Wallen, 2000). Ndhiwa Sub County, Kenya had a total of 40 secondary schools with a population of 7124 students. The researcher used 12 secondary schools with six schools using PBL while the remaining six schools followed LTM which acted as control. There was random assignment of Form Two classes to PBL and LTM respectively. The design allowed the possibility of manipulating independent variable in order to determine the degree of its casual effect (Sekeran & Bougie, 2011). Certainly, using the design gave valid assurances on internal and external validity. The design had the convenience of controlling reactive effects of experimentation in intact classes, thus making students probably unaware that a research was being undertaken than in situations where participating students are chosen from classes and placed into experimental sessions (Ary et al., 2010). As such, the researcher was able to apply and generalise the findings because the design was found appropriate for monitoring and controlling any viable threats to internal validity. The experimental group and control group undertook pre-test and post-test resulting into four observations that were vital for estimating the effect of experimental treatment as compared to control variable. Pre-test was given to students before instruction. The design adopted, allowed comparison of the final post-test results between experimental and control groups to ascertain the effects of treatment (PBL), Flick (2006). The research was done in February to March 2019 which lasted for six weeks, after which the post-test was administered to the two groups as shown in Table 1.

Table 1: Non-Equivalent Control- Group Pretest-Posttest Design

Group	Pre-test	Treatment	Post-test
Experimental group	O_{1D}	X_D	O_{2D}
Control group	O_{1K}		O_{2K}

Where:
O_{1D} were experimental pre-test scores for PBL method

O_{2D} were experimental post-test scores for PBL method
X_D were treatment for PBL method
O_{1K} were control pre-test scores
O_{2K} were control post-test scores

The research employed stratified random sampling method to specifically select the schools in accordance to school category. The unit of sampling was secondary schools as opposed to individual learners (Borg & Gall, 1989), since secondary institutions function as intact groups with varying students' numbers per class. Thus, every school was taken as one group, therefore twelve schools were duly selected to participate, with 280 students in six experimental schools and 204 students in six control schools. There were 249 boys and 235 girls in the sample size of 484 students. Therefore, the sample used were adequate in making generalization of research results. The list of schools constituted sampling frame which was established from Ndhiwa Sub County Director of Education records (2017). Selection of schools was based on students' gender including boy's only schools, girl's only schools and mixed schools. Purposive sampling became handy in the selection of trained teachers and Form Two students. There was further sub-categorisation of schools depending on teaching method adopted. Thus, each of the control and experimental categories were composed of two boys 'schools, two girls 'schools and two co-educational schools respectively, totalling to 12 schools. Sampling took into account the number of schools per category. Twelve trained teachers were purposefully selected for the research. Therefore, six teachers were trained on PBL methodology while the remaining six were trained on lecture teaching method. Determination of sample size was based on students' enrolment during research. Certain considerations, such as, school location in terms of divisions within the Sub County, syllabus coverage, willingness to cooperate and gender balance were used. According to recommendations by Fraenkel and Wallen (2000) at least 30 subjects per group are adequate for research purposes. Therefore, the 12 participating schools had at least 30 students in Form Two. All the 484 students in participating schools were involved in the research process since students' classes cannot be dismantled and reconstituted for research purposes, rather, they remained intact during the research (Fraenkel & Wallen, 2000). The sample used were actual students that were present in Form Two in the 12 schools.

Agriculture Achievement Test (AAT) was the principal research instrument used in administration of pre-test and post-test respectively. Therefore, test scores were deliberately used as data (McMillan & Schumacher, 1997). The test scores were obtained from marking of students scripts after administration of pre-test and post-test. The AAT were standardized and validated for face and content validity to examine the appearance and representativeness of the content studied (Netemeyer et al., 2003). This was done by subject specialist teachers and a panel of experts in the Department of Agricultural Education and Extension at Egerton University. The designing of the instrument was done with the aim of determining achievement levels of participating students. Specifically, the contents of agriculture achievement test was adapted from the Livestock Production II (Nutrition) topic in Form Two secondary agriculture syllabus. The researcher modified the instruments based on experts' recommendations. Pilot test was conducted with 50 Form Two students in a school in another Sub County other than those included in the sample. Piloting helped in evaluating the instruments content and format by allowing students engaged in the process to provide valuable feedback on the ease or difficulty of taking and completing the items. Comments and suggestions received from piloting touching on unclear and ambiguous questions were used to review the items. Reliability was established using test-retest method that yielded reliability coefficient of .78. This implied that the instruments were reliable and therefore suitable in making accurate group inferences (Fraenkel & Wallen, 2000). Students were not allowed to write their names on the question papers to guard against their confidentiality. Teachers were also assured that results from the research were to be used only for research purposes. This particular approach enabled the researcher to establish good relationship between the teachers and students.

Scores obtained were organized into categories. Therefore, descriptive statistics (mean, mode, median and standard deviation) and inferential statistics (t-test, chi-square, ANCOVA and ANOVA) were systematically used to tabulate the data at .05 level of significance. The advantage of using ANCOVA was to statistically control for a third variable known as a confounding variable. Statistical Package for Social Sciences (SPSS) version 25 software were employed in data analysis.

3. Results

In a nutshell, the researcher had to control the known confounding variables, for example, time difference in administering pre-test and post-test and topic to be covered. This helped the researcher to make accurate deductions of the effect of treatment (PBL).

3.1 Performance of Students in Pre-test Examination

The results shown in Table 2 captures how the students performed in pre-test before any learning intervention.

Table 2: Achievement in Categories for Students Pre-test Scores

Score Categories	Frequency	Percent	Mean	Median	Mode	Standard deviation
Below 10	6	1.2	31.8	30	30	12.01
11-20	41	8.5				
21-30	105	21.7				
31-40	109	22.5				
41-50	103	21.3				
51-60	67	13.8				
61-70	45	9.2				
71-80	8	1.8				
Above 81	0	-				
Total	484	100.0				

The results in Table 3 shows the outcome of students' performance after exposure to treatment (PBL).

Table 3: Distribution of Scores for Students taught through PBL Method

Score in Categories	Frequency	Percent	Mean	Median	Mode	Standard deviation
21-30	6	2.1	57.47	57	60	13.19
31-40	24	8.6				
41-50	53	18.9				
51-60	84	30.0				
61-70	68	24.3				
71-80	33	11.8				
Above 81	12	4.3				
Total	280	100.0				

Results from Table 3 showed that students who learnt agriculture through PBL method attained 57.47 in terms of mean score with a standard deviation of 13.19. The highest score obtained by the students was 89 percent with a minimum score of 22 percent.

Notably, Table 2 presents the achieved mean scores and standard deviation for students in pre-test, while Table 3 successively gives a clear picture of achievement of students in post-test for students who received instruction through PBL teaching method. Pre-test mean score of 31.8 was obtained (Table 2). However, there was a marked increase in mean (57.47) and standard deviation of 13.19 in post-test scores under PBL method (Table 3). In comparing post-test scores with pre-test scores, it is crystal clear that PBL post-test mean score of 57.47 was higher than pre-test mean score of 31.8. There was a mean difference of 25.67 realized due to administration of PBL treatment. Thus, the finding established that using PBL positively increased students' achievement in agriculture subject. Chi square analysis was performed to show the distribution of students score as seen in Table 4.

Table 4: Chi-Square Test Performed on the Frequency Distribution of Students Score

Score	Observed N	Expected N	Residual	Statistics
21-30	6	40.0	-34.0	$\chi^2 = 128.35$
31-40	24	40.0	-16.0	$df = 6$
41-50	53	40.0	13.0	$p = .001$
51-60	84	40.0	44.0	
61-70	68	40.0	28.0	
71-80	33	40.0	-7.0	
Above 81	12	40.0	-28.0	
Total	280			

The chi- square results (Table 4) revealed that students score between 51 and 60 which was high (or good) were statistically and significantly (χ^2=128.35, *df* 6, *p*.001). This was found to be higher than the other categories in the score distribution. As such, the overall performance of students in this topic in agriculture was rated good. This increased positive indicator in performance is agriculture subject in the Sub County may be due to the type of teaching method utilised by the teachers in this research. In other words, students increased performance confirms that PBL is a robust teaching method that inspires students to improve their learning outcomes in a significant way.

3.2 Hypothesis Testing

Testing the hypothesis in this research required the use of Analysis of Covariance (ANCOVA) which was performed to determine the effect of lecture teaching method (control) and Problem Based Learning (treatment) on post-intervention agriculture score after controlling for pre-intervention. Therefore, the unadjusted and adjusted means for the lecture teaching method and PBL method based on the covariate (pre-intervention score) are shown in Table 5.

Table 5: Adjusted and Unadjusted Means and Variability for Post-intervention Score with Pre-intervention Score as a Covariate

		Unadjusted		Adjusted	
Teaching methods	N	Mean	Standard deviation	Mean	Standard Error
Lecture	204	43.76	10.40	44.36	.549
Problem Based Learning	280	57.47	13.19	56.81	.469

Typically, the results displayed in Table 5 shows unadjusted mean ± standard deviation. The research established that students' scores achieved as a result of Problem Based Learning intervention (57.47 ± 13.19) were statistically higher compared to lecture teaching method scores (43.76 ± 10.40). Basically, the adjusted means (means adjusted for the covariate) were lower than the unadjusted means.

The performance of Levene's test did not find data with outliers. The Levene's test for PBL (treatment) and LTM (control) had equal variances as shown in Table 6.

Table 6: Levene's Test of Equality of Error Variances

F	*df1*	*df2*	*p*
77.279	2	445	.220

Results indicated that there was homogeneity of variances, as assessed by Levene's test of homogeneity of variance (p = .220). Therefore, Levene's test results was not statistically significant (p >.05) meaning that the assumption of homogeneity of variances was not violated. The one- way ANCOVA test in Table 7 confirmed whether there were any statistically significant group differences on the dependent variable after adjusting for the covariate.

Table 7: Tests of Between-Subjects Effects

Source	Type III Sum of Squares	*df*	Mean Square	F	*p*	Partial Eta Squared
Corrected Model	20019.978[a]	1	20019.978	194.778	.001	.412
Intercept	6552.320	1	6552.320	63.749	.001	.187
Control (Pre-test)	20019.9780	1	20019.978	194.778	.001	.412
Intervention	.000	0	-	-	-	.001
Error	28573.847	278	102.784			
Total	973539.000	280				
Corrected Total	48593.825	279				

Dependent variable: Post-test score
a. R Squared = .412 (Adjusted R Squared = .410)

Post-Hoc mean comparisons

The comparisons were done using Bonferroni post-hoc tests for the mean pairs in PBL and LTM at 95 % confidence interval for the difference between group I and J is summarized in Table 8.

Table 8: Pairwise Comparisons of the Means Using the Bonferroni Post Hoc Test

Comparison between Lecture (I) and Problem Based Learning (J) method	Mean Difference	Std. Error	*p*	95% Confidence Interval for Difference	
				Lower Bound	Upper Bound
(I-J)	-12.45	.723	.001	-14.189	-10.721
(J-I)	12.45	.723	.001	10.721	14.189

Dependent variable: Post-test score for PBL

In order to find out the means which were statistically significant from each other, the researcher performed post hoc mean comparisons using Bonferroni test. The pairwise comparisons for the mean pairs shown in Table 8 clearly indicate that post-intervention score for the Problem Based Learning method were statistically and significantly greater than the lecture teaching method (control) with a calculated mean difference of 12.45 (95% CI, 10.72 to 14.18) %, p < .001).

Univariate analysis using the F and Eta Squared tests
The variances in Table 9 ranges between 0 and 1, where .01 is small, .06 medium, and above > .14 is large.

Table 9: Univariate Analysis

	Sum of Squares	***df***	**Mean Square**	**F**	***p***	**Partial Eta Squared**
Contrast	20019.973	1	5265.755	194.778	.001	.412
Error	28573.847	278	102.784			

R Squared = .412 (Adjusted R Squared = .410)

4. Discussion

The results of PBL are significant in informing education administrators' and teachers of agriculture in Kenya to embrace the use of PBL as a teaching method in agriculture subject, since the method has clearly demonstrated that it is more effective as a teaching method as compared to lecture teaching method. Similarly, educators at tertiary institutions and universities in Kenya has been informed on the need to train pre-service teachers about the use of PBL method. This is because PBL is not among the popular teaching methods used in Kenya.

The findings in Table 5 indicated that PBL teaching method is superior to lecture teaching method. Students who were taught through PBL posted higher learning outcomes with post-test mean score of 57.47 while their counterparts in the lecture teaching method had a mean score of 43.76. The impressive results realized under PBL method is in agreement with Strobel and van Barneveld (2009) study that found that teaching students through PBL enhanced students' ability to retain desired knowledge and skills that was acquired through learning experience. Therefore, the reason for high achievement of students under PBL method was due to uniqueness of PBL in enabling students to sufficiently retain what they were taught. Therefore, teaching through PBL enabled students to strategically apply a variety of skills, such as, independent research, application of knowledge in concrete situations by utilizing creativity in a manner that helps them in analysing situations. These skills were essential in helping the students to post higher achievement in PBL method as opposed to students who were taught using the lecture teaching method.

The results in Table 7 further confirmed that adjustment that was done for pre-intervention agriculture scores, produced a statistically significant difference in post-intervention scores between the interventions, F (1, 278) = 194.778, $p < .001$, partial $\eta^2 = .412$. This necessitated rejection of null hypothesis. For this reason, the research ascertained that there were statistically significant differences on achievement of students in agriculture for the groups of students who were specifically instructed through PBL than those who were taught through lectures. The differences established could explain the robust nature of PBL in delivering content which in turn improved students' achievement in agriculture. Similar results were observed in construction engineering courses where significant learning differences in the learning gains were established between students instructed through PBL and lecture methods (Rodríguez & Fernández, 2016). The students taught through PBL had over 30% increase in their average grade as compared to students taught through lecture teaching method.

The improved results was attributed to the fact that PBL lessons involved learners through small group discussions on actual real problems inherent in agriculture. PBL method allowed sharing of ideas and different viewpoints between students in the process of resolving problems under investigation. Therefore, there was continuous reconstruction of meanings about the learning issues which allowed for high retention of what has been discussed. The method gave students an opportunity to develop a range of skills, in addition to independent learning that occurred with minimum guidance from the teacher. The findings are in agreement with Bilgin et al. (2009) study that established that students who were exposed to PBL in learning conceptual gas concepts performed exceptionally well compared to students who received instruction through lectures. However, the research study did not establish substantial differences in students' achievement between PBL method and lecture teaching method in quantitative gas concepts.

5. Conclusions and Recommendations

Given the fact that learning is a process that involves several mental activities, such as, investigation and authentic reasoning that requires use of good strategies in solving problems. Teachers, therefore, should be cognisant of the fact that students achievements increases if they are able to solve problems rather than remember isolated facts. A learning environment where use of lectures is the main teaching method in most instances fail to promote proper engagement and participation of learners nor develop problem-solving skills in students. Problem solving skills are better developed when meaningful engagement among students occurs during learning. PBL improves the academic achievement of students in agriculture subject. The teaching method has demonstrated superiority over lecture teaching method by posting higher mean scores than lecture method in agriculture subject. PBL method as a teaching method is not a regular teaching method in Kenya as compared to other teaching methods, therefore,

PBL method should be introduced in teaching of agriculture subject in Ndhiwa Sub County to improve students' achievement. PBL use may remedy the persistent poor achievement of students in agriculture subject in this Sub County. The Ministry of Education, Science and Technology through Kenya Institute of Curriculum Development should incorporate PBL as a teaching method in the secondary school agriculture syllabus for teaching of agriculture subject. Universities and Teacher Training Colleges in Kenya should equip pre-service teachers by using PBL in teacher preparation programmes. Use of lecture teaching method should be discouraged to improve students learning outcomes.

6. Acknowledgments

I would like to thank secondary school principals for allowing us to conduct this research study in their schools. Much gratitude goes to the teachers of agriculture who took their precious time to train in PBL and lecture teaching method. They taught agriculture subject using the two teaching methods. Many thanks go to students who participated throughout the research from inception to the end. Finally, to Prof. Kathuri and Dr. Nkurumwa, I am so grateful for your valuable contribution throughout the research period and final writing of this paper.

References

Abanikannda, M.O. (2016). Influence of problem-based learning in chemistry on academic achievement of high school students in Osun State, Nigeria. *International Journal of Education, Learning and Development, 4(3)*55-63.

Adunola, O. (2011). Impact of teachers' teaching methods on the academic performance of primary school pupils in Ijebu-Ode Local Government Area of Ogun State. Ego Booster Books.

Achor, E.E, Imoko, B.I, & Uloko, E.S. (2009). Effect of ethno mathematics teaching approach on senior secondary students' achievement and retention in locus. *Education Research and Reviews 4(8)*385-390.

Akanle, O. B. (2007). "Socio-economic factors influencing students' academic performance in Nigeria some explanation from a local survey," Sociology and Social work community. Free online library.

Ary, D., Jacobs, C. J., Sorensen, C., & Auwal, A. (2013). Influence of teaching method on retention of agricultural science knowledge in senior secondary schools of Bauchi Local Government Area, Nigeria. *International Journal of Science and Technology Education Research, 4(4)*63-69.

Bilgin, I., Senocak, E., & Sozbilir, M. (2009). Effects of problem-based learning instruction on university students' performance of conceptual and quantitative problems in gas concepts. *Eurasia Journal of Mathematics, Science and Technology Education, 5(2)*153-164.

Borg, B.S., & Gall, M.D. (1989). *Education Research. An Introduction. (6th Ed.).* Longman.

Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research.* Houghton Mifflin.

Cascio, C. (2015). Factors of poor student performance. Retrieved June 7, 2020, from http://classroom.synonym.com/factors-poor-student-performance12636.html

Charlton, B. G. (2006). Lectures are an effective teaching method because they exploit human evolved 'human nature' to improve learning. *Editorial Medical Hypotheses*, *67(6)*1261-1265. doi:10.1016/j.mehy.2006.08.001.

Diao, X., & Yanoma, Y. (2003). Exploring regional dynamics in Sub-Saharan African agriculture, DSGD discussion papers 2, International Food Policy Research Institute (IFPRI).

Flick, U. (2006). *An introduction to qualitative research* (*3rd Ed*.). Sage Publications Ltd.

Fraenkel, J.R., & Wallen, N.E. (2000). *How to design and Evaluate Research in Education*, McGraw-hill Companies Inc.

Fry, H., Ketteridge, S., & Marshall, S. (2009). *A handbook for teaching and learning in higher education: enhancing academic learning.* Routledge Falmer.

Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review, 16(3)*235-266.

Kenya National Examination Council. (2013). The Year 2012 KCSE Examination Candidates Performance. Kenya National Examination Council, Nairobi, Kenya.

Kenya National Examination Council. (2016). The 2015 Kenya Certificate of Secondary Education (KCSE) Examination Essential Statistics.

Khairiree, K., & Kurusatian, P. (2009). Enhancing students' understanding statistics with Tinker Plots: problem-based learning approach. Available at:http://atcm.mathandtech.org/EP2009/papers_full/2812009_17324.pdf

Kibett, J.K. (2002). Effect of project-based learning on student performance in secondary school agriculture (Unpublished PhD Thesis). Njoro, Kenya: Egerton University.

Mabrouk, P.A. (2007). Bio analytical chemistry: model for a fully integrated problem based learning approach. Active learning: models from the analytical sciences. *Journal of American Chemical Society*, *970*, 69-86.

Marmah, A. A. (2014). Students' perception about the lecture as a method of teaching in tertiary institutions. *International Journal of Education and Research*, *6(2)*34.

McMillan, J. H., & Schumacher, S. (1997). *Research in education: A conceptual introduction* (4th Ed.). Longman.

Michael, P. (2004). Does active learning work? A review of their Research. *Journal of Engineering Education, 93(3*) 223-231.

Ndhiwa Sub County Director of Education Office Records (2017). *Ndhiwa Sub County Secondary Schools Enrolment Data.* Ministry of Education, Ndhiwa.

Netemeyer, R. G., Bearden, W. O., & Sharma, S. (2003). *Scaling procedures: Issues and applications.* Sage.

Piaget, J. (1972). *The psychology of the child*. New York: Basic Books.

Rodríguez González, C.A., & Fernández Batanero, J.M. (2016). A review of Problem-Based Learning applied to Engineering. *International Journal on Advances in Education Research. 3(1)*14-31.

Sekaran, U., & Bougie, R. (2011). *Research methods for business*. A skill building approach. Aggarwal Printing Press.

Shikuku, B. N., & Amadalo, M. M. (2015). Problem based learning technique and its effect on acquisition of linear programming skills by secondary school students in Kenya. *Journal of Education and Practice, 6(20)*.

Strobel, J., & van Barneveld, A. (2009). When is PBL more effective? A meta-synthesis of meta-analyses comparing PBL to conventional classrooms. *The Interdisciplinary Journal of Problem-based Learning, 3(1)* 44-58.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* Harvard University Press.

Wachanga, S.W., & Mwangi, J.G. (2004). Effects of co-operative class experiment teaching method on secondary school student's chemistry achievement in Kenya's Nakuru District. *International Education Journal*, *5(1)*26-36.

The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 199-212
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.187

Exploring Levels of Secondary School Students' Knowledge: Global Warming, Acid Rain, and Ozone Layer Depletion

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Abstract
The aim of this study was to investigate the levels of secondary school students' knowledge about three Global Environmental Problems: Global Warming, Acid Rain, and Ozone Layer Depletion. 638 7th grade (N=316) and 8th grade (N=322) students enrolled in five different secondary schools participated in this study. The survey method was used to determine the levels of students' knowledge of three global environmental problems. In this study, drawings (separate for each topic) and open-ended questions specific to all three topics were used as data collection tools. The data obtained from drawings and open-ended questions were analyzed together and assessed based on three knowledge categories (informed view, transitional view, and naïve view). The results indicated that the levels of secondary school students' knowledge about three global environmental problems were low. It was also found that they held various misconceptions and their knowledge levels on each topic were close to each other. The results of the Pearson Correlation indicated that there was a significant relationship between the levels of secondary school students' knowledge about only GW and OLD, but a weak correlation. The results of MANOVA indicated that there was a significant difference in the mean scores of students' knowledge of GW from 8th to 7th-grade students, while there was a significant difference in favor of 8th-grade students with respect to the topics of AR and OLD.

Keywords: Global Warming, Ozone Layer Depletion, Acid Rain, Secondary School Students, Science Education

1. Introduction

The increasing needs of societies in parallel with the development of technology, population increase, expansion of heavy industry, and continuous migration from villages to cities in the last century have led to the unconscious use of natural resources in the world and therefore the deterioration of natural balances. Another reason for the disruption of the natural balance may be that the needs of societies and their political/economic visions are considered more important than the interaction of environmental events in harmony with each other. For example, it is clearly seen that many countries do not fulfill their responsibilities for their own interests, despite the international organizations and agreements for the solution of global environmental problems. For

these reasons, the effects of global environmental problems such as GW, AR, and OLD, which are among the most important environmental problems, have concretely been observed in recent years. Furthermore, the fact that GW, AR, and OLD are among the problems that affect the whole world may be another importance of these issues. Since the topics of GW, AR, and OLD, which are interdisciplinary and socio-scientific topics, are both complex and abstract (Boyes, Chambers, and Stanisstreet, 1995), the definition of these three global environmental issues, how they occur, their reasons, effects and the relationship between these three issues are difficult to understand and be taught. In addition, the research indicated that the learners have many misconceptions about these three topics (Khalid, 2003). One of the most basic and effective ways to overcome such important environmental problems is to prepare conscious individuals who are equipped with knowledge related to environmental problems. The way to provide individuals with the characteristics of these qualities can be possible with qualified environmental education. Therefore, students are expected to first have adequate conceptual knowledge on such important environmental issues.

Since the 1970s, there have been numerous attempts to reveal students' views of science topics. In the literature, students' prior knowledge of any subject is defined in different ways such as misconceptions, alternative concepts, unscientific opinions, or naive views. Misconceptions, which pose an obstacle in the construction of knowledge, strongly resist to change with the true knowledge; however, they should be overcome (Clough and Driver, 1985; Hammer, 1996; Osborne, Bell, and Gilbert, 1983; Posner, Strike, Hewson, and Gertzog, 1982). Therefore, it is important to determine the students' views and the reasons for their misconceptions, prior to teaching, in terms of the planning of the course in order to ensure the restructuring of learning (Clough and Driver, 1985; Odom and Barrow, 1995; West and Pines, 1985).

1.1. Significance of the study

We believe that this study may provide important contributions to the literature, considering all these reasons described above. When the studies on global environmental problems were examined, GW, AR, and OLD are among the topics that researchers have focused more (Marinopoulos and Stavridou, 2002) and there were many studies regarding the conceptual understanding of students, teachers and pre-service teachers (Andersson and Wallin, 2000; Aydemir et al., 2010; Boyes and Stanisstreet, 1992; Boyes, Stanisstreet and Papantoniou, 1999; Cordero, 2000; Dove, 1996; Groves and Pugh, 2002; Herman, Feldman and Vernaza- Hernandez, 2017; Jafer, 2020; Karakaya, 2012; Kaya, 2011; Khalid, 1999; Koulaidis and Christidou, 1999; Syibo, 1995). The researchers indicated that the participants had a variety of misconceptions about these environmental issues (Khalid, 2001; Papadimitriou, 2004; Vosniadou 1994; Vosniadou and Verschaffel, 2004). In the literature, there have been studies in which each topic was separately investigated, or no more than two topics (e.g. GW and OLD or GW and AR, etc.) were explored together. However, there is a limited number of studies in which these three topics are investigated together to determine secondary school students' knowledge. In addition, the fact that this study was conducted with a number of secondary school students is one of the importance of the study, which provides an opportunity to more comprehensively evaluate students' understanding of these issues.

The aim of this study was to investigate the level of secondary school students' knowledge about global warming, acid rain, and ozone layer depletion. Within the scope of this main aim, the following research questions were investigated:

1. What is the level of secondary school students' knowledge about GW, AR, and OLD?
   1.1. What is the level of secondary school students' knowledge about the definitions of GW, AR, and OLD?
   1.2. What is the level of secondary school students' knowledge about the reasons for GW, AR, and OLD?
   1.3. What is the level of secondary school students' knowledge about the effects of GW, AR, and OLD?
   1.4. What is the level of secondary school students' knowledge about how to prevent GW, AR, and OLD?
2. Is there a statistically significant relationship among the levels of secondary school students' knowledge about the topics of GW, AR, and OLD?
3. Are there significant differences in the level of secondary school students' knowledge of GW, AR, and OLD by the grade level of secondary school students?

2. Method

In this study, the survey method was used to determine the level of conceptual understanding of secondary school students about global environmental problems. This method is an approach that describes the past or current situation as it is, and includes data collection over a period of time (Creswell and Plano-Clark, 2007).

2.1. Participants

The sample included a total of 638 7th grade (N=316) and 8th grade (N=322) students enrolled in five different secondary schools in Elazığ/Turkey during 2016-2017 academic year. In this study, the convenience sampling method was used to determine the sample of this study.

2.2. Instrument

In this study, the triangulation, which refers to the "the use of two or more methods of data collection in the study of some aspect of human behavior" (Cohen, Manion and Morrison, 2007, p. 141), was used to verify and validate the data obtained from the study. Data collection tools were a form consisting of (1) drawing and (2) open-ended questions for each of the topics of GW, AR, and OLD. Drawings are important and useful tools because they provide the opportunity to effectively express views, misconceptions, or conceptual change on a particular topic without limiting words or sentences (White and Gunstone, 1992). Furthermore, drawings help students, who do not want to answer questions during the assessment, give answers quickly (Thomas and Silk, 1990). The open-ended questions provide the participants to deeply express their own views (Mukherji and Albon, 2015). Therefore, students were first asked to make drawing, reflecting their opinions on each topic, and then answer open-ended questions. For example, while the question- "Can you describe what you know about global warming" was used for the global warming issue on the front face of the form, open-ended questions (such as "Can you explain what you draw in the picture?", "What is global warming?", "What causes global warming?", "What will happen if global warming occurs?", "How can we prevent global warming? Can you explain?") were addressed to students on the backside of the form. This process was performed in the same way for the other two topics (acid rain and ozone layer depletion). For each topic, the students were given 30 minutes for drawing and 15 minutes for open-ended questions.

2.3. Data Analysis

The data obtained from drawings and open-ended questions were analyzed together and assessed based on three knowledge categories (informed view, transitional view, and naïve view). The students' views, as shown in Table 1, were scored as "informed view: 3,5-point, transitional view: 1 point and naive view: 0 point" (Vazquez-Alanso and Manassero-Mas, 1999). In addition, an independent researcher analyzed the data to ensure reliability, and Cronbach's alpha was found to be 0.87. On the other hand, Pearson Correlation was used to determine whether there is a statistically significant relationship among secondary school students' knowledge about the topics of GW, AR, and OLD. Also, the one-way multivariate analysis of variance (one-way MANOVA) was conducted to explore the impact of the students' grade level on their level of knowledge about GW, AR, and OLD.

Table 1: Categories used in the analysis of data

Level	Description
Informed View (3,5 Points)	It is the level at which there is no misconception or partial concept and the answer is fully expressed.
Transitional View (1 Point)	It is the level at which there is no misconception but the answer is partially expressed.
Naive View (0 Point)	It is the level at which there are misconceptions or no answer.

3. Results

The frequency and percentage values of the 7th and 8th grade students' understandings on the topics of GW, AR, and OLD are summarized in Table 2, 3, 4 and 5.

3.1. What is the level of secondary school students' knowledge about GW, AR, and OLD?

3.1.1. What is the level of secondary school students' knowledge about the definitions of GW, AR, and OLD?
The results obtained from the drawings and open-ended questions showed that most of the 7th (%93.35) and 8th-grade students (%82.61) had various misconceptions or no knowledge about the definition of the GW (Table 2). The students with naïve views mostly defined global warming as the sun rays entering the earth's atmosphere or the increase of harmful gases such as greenhouse gases. For example, these students believed that greenhouse gases were harmful gases and when the amount of these gases (e.g. CO, SO_2, etc.) increases, GW occurs. % 6.65 of the 7th and %15.84 of the 8th-grade students had partial understandings about the definition of the GW. These students mentioned the concepts of the greenhouse effect, temperature increase, but, were not able to adequately explain their views. On the other hand, of the students, the only %1.55 8th grade students were able to explicate the definition of GW. The students with informed view in general noted that GW was the gradual heating and temperature changes of Earth's atmosphere, waters, and surface, or it occurs as a result of the increase the amount of gases called greenhouse gases.

Table 2: Findings on secondary school students' knowledge level of the definitions of GW, AR, and OLD

Level	Grade	GW	AR	OLD
Informed View	**7th**	0	5	20
		(%0)	(%1.56)	(%6.25)
	8th	5	8	11
		(%1.55)	(%2.48)	(%3.42)
Transitional View	**7th**	21	15	177
		(%6.65)	(%4.75)	(%55.31)
	8th	51	27	165
		(%15.84)	(%8.39)	(%51.24)
Naive View	**7th**	295	296	119
		(%93.35)	(%93.67)	(%37.66)
	8th	266	287	146
		(%82.61)	(%89.13)	(%45.34)

With respect to the definition of acid rain, Table 2 indicates that the vast majority of 7th (%93.67) and 8th grade students (%89.13) held naïve views. Many students believed that AR is pure acid or accumulation of harmful gases or type of rain that directly and suddenly damages everything. Some students portrayed or explained that AR occurs when dirty and harmful gases (e.g., CO_2) react with rainwater in the atmosphere. %4.75 7th and %8.39 8th grade students had transitional views (Table 2). Some students mentioned that some gases react with water vapor, but were unable to explain the nature of these gases. Some students with transitional views seemed to believe that the conversion of SO_2 to other compounds causes acid rain to occur, but they had no knowledge about these compounds. Contrary to this, of the students, only a minority of 7th (%1.56) and 8th-grade students (%2.48) were well informed about the definition of AR. Some of these students emphasized that acid rain is a dry or wet form of precipitation and occurs when the gases of $SO2$ and NO_x are combined with water vapor. Some students defined precipitation with pH less than 5.4 as acid rains. Compared to the definition of AR and GW, it is seen that students had a better understanding of the definition of OLD, even partially. Table 2 shows that more than half of 7th (%55.31) and 8th-grade students (%51.24) had transitional views. These students in general reported or portrayed that OLD is the reduction of the amount of ozone or the damage to the ozone layer in the atmosphere because of some reasons, however, they were unable to give a reason for their answers. On the other hand, %37.66 of 7th and %45.34 of 8th-grade students held various misconceptions, while the remaining

students were able to articulate informed views. Almost all students with naïve views believed that OLD was a "physical hole" in the atmosphere. Also, some students stated that OLD was formed as a result of some harmful gases or chemicals damaging the ozone layer. When these students were asked the nature of these harmful gases and chemicals, they mentioned the concepts of CO, CO_2. Some students mentioned that OLD was the accumulation of harmful gases in the atmosphere and when the amount of these gases reaches more than ozone gas, OLD is formed, etc. The students that had sound understandings about the definition of the OLD in general emphasized that substances containing CFCs break down ozone and OLD occurs because of the decrease in the amount of O_3 in the stratosphere. Figure 1 presents several drawings of students about the definition of GW, OLD and AR.

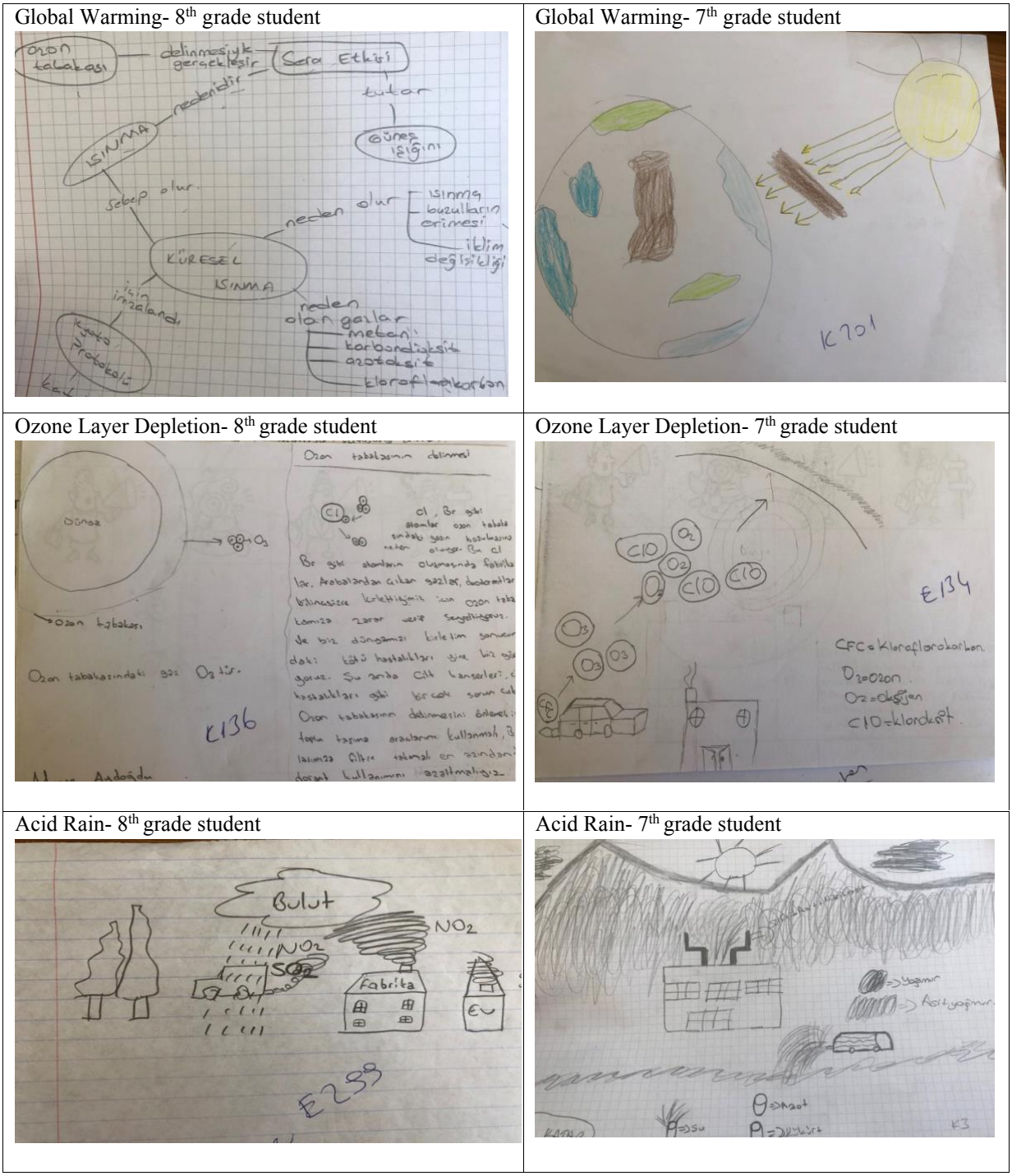


Figure 1: Some drawings of students about the definition of GW, OLD, and AR

3.1.2. What is the level of secondary school students' knowledge about the reasons of GW, AR, and OLD?
Table 3 indicates the findings on 7th and 8th-grade students' knowledge level of the reasons of GW, AR, and OLD. As shown in Table 3, no students were able to explicate an informed view about the reasons for these three topics. For the topic of GW, most of the 7th (%67.72) and 8th-grade students (%71.43) held various misconceptions, while the remaining students had partial knowledge. Many students with naïve views reported that ozone layer depletion is one of the main reasons for GW, the sun rays will get through the atmosphere due to the OLD, and thus the temperature in the earth will increase. This naïve view was one of the most common misconceptions they had. Some students argued that AR causes the GW, while some students mentioned the toxic gases such as CO, NO_2, etc., released from factories and cars are the ones of the main reasons for GW. Many students reported that climate changes caused GW. Few students mentioned the greenhouse gases but misunderstood these gases (e.g. CO, SO_2, etc.). The students that had transitional views in general reported or portrayed that use of fossil fuel, increasing the amount of greenhouse gases causes GW, but they had no or inadequate knowledge about the greenhouse gases. Some students believed that only CO_2 causes the GW, however, these students were unable to explain how CO_2 affects GW.

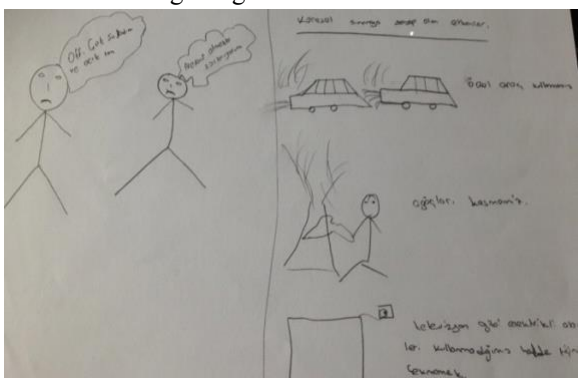
Table 3: Findings on secondary school students' knowledge level of the reasons of GW, AR, and OLD

Level	Grade	GW	AR	OLD
Informed View	**7th**	0 (%0)	0 (%0)	0 (%0)
	8th	0 (%0)	0 (%0)	0 (%0)
Transitional View	**7th**	102 (%32,28)	87 (%27,53)	85 (%26,56)
	8th	92 (%28,57)	164 (%50,93)	149 (%46,27)
Naive View	**7th**	214 (%67,72)	229 (%72,47)	231 (%73,10)
	8th	230 (%71,43)	158 (%49,07)	173 (%53,73)

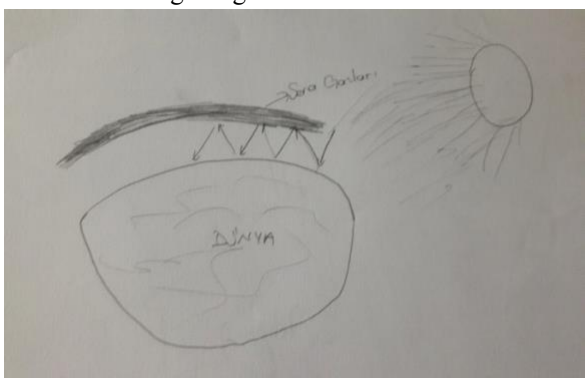
With respect to the reasons for acid rain, 7th (%27.53) and 8th-grade students (%50.93) had transitional views (Table 3). For example, many students portrayed or mentioned that human activities, the fumes from the volcanoes, or the exhaust from cars were one of the main causes of it. Some students also pointed out that some pollutants such as air pollution caused it. These students mentioned the sources of acid rain but were not able to explain the reasons for it. On the other hand, the remaining students had naïve views and commonly emphasized that harmful gases such as CO, CO_2, or nuclear waste caused acid rain. Some students stated that GW is one of the main reasons for acid rain, while some students believed that UV rays triggered the formation of AR because of OLD. Few students both portrayed and reported perfumes and deodorants as the cause of acid rain. In addition, several students interestingly claimed that there was a strong relationship between earthquakes and global warming.

Looking at Table 3, it is seen that most 7th (%73.10) and 8th-grade students (%55.73) held various misconceptions about the reasons for OLD. For example, they in general believed that the causes of GW and AR such as CO_2, CH4 from car emissions and air pollution especially coming from factories are responsible for OLD. Some students mentioned that intense sun rays damaged the ozone layer as a result of solar flares. Several students claimed that missiles launched into space and nuclear tests seriously damaged the ozone layer. It was also understood that some students portrayed the harmful gases, exhaust from cars, etc., as the reasons for OLD. Contrary to this, %26.56 of 7th and %46.27 of 8th-grade students had partial understandings of the reasons for OLD. For example, almost all of these students recognized perfumes and deodorants as ozone-depleting substances. However, they had no knowledge about which ingredient(s) in perfumes and deodorants caused the OLD. Figure 2 presents several drawings of students about the reasons for GW, OLD, and AR.

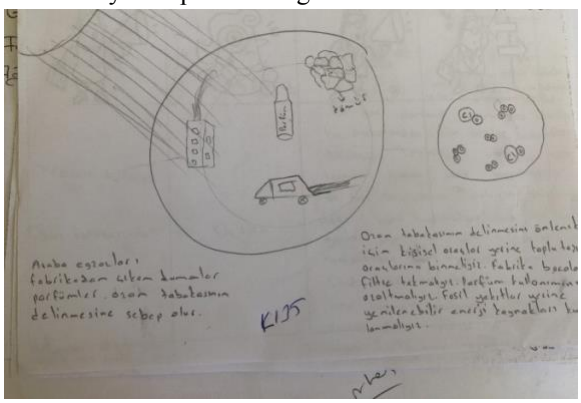
Global Warming- 8th grade student



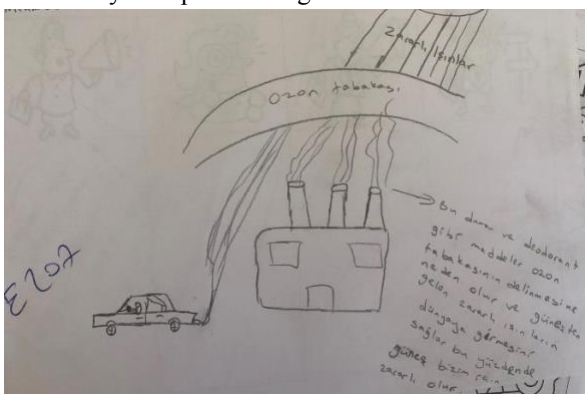
Global Warming- 7th grade student



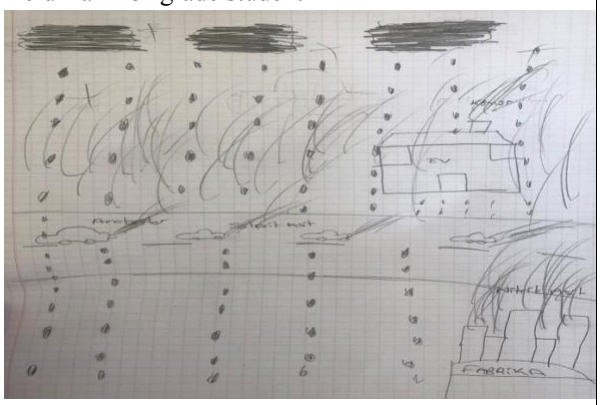
Ozone Layer Depletion-8th grade student



Ozone Layer Depletion-8th grade student



Acid Rain- 8th grade student



Acid Rain- 7th grade student

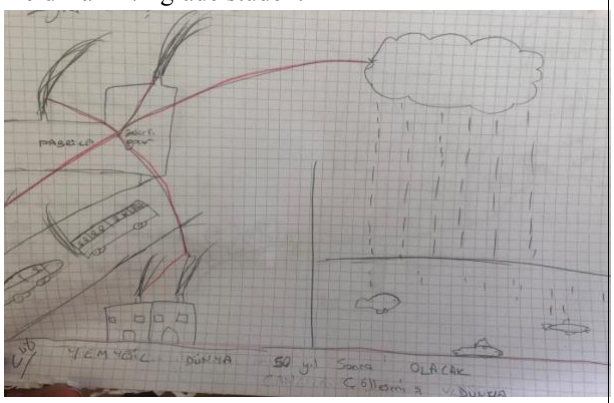


Figure 2: Some drawings of students about the reasons for GW, OLD, and AR.

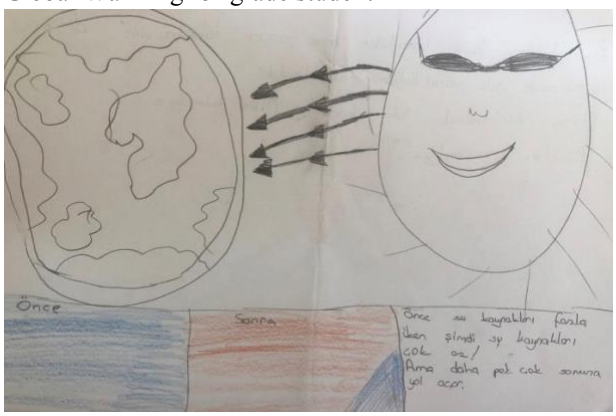
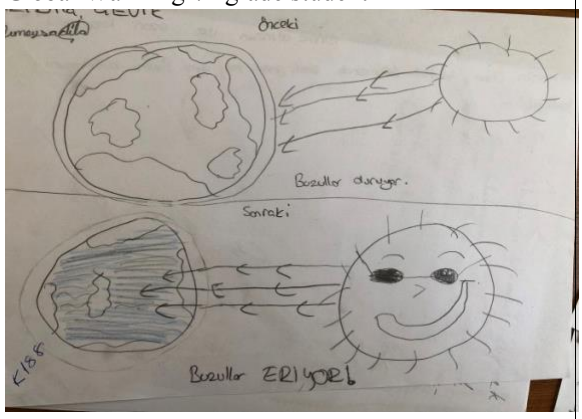
3.1.3. What is the level of secondary school students' knowledge about the effects of GW, AR, and OLD?

The findings on secondary school students' knowledge level about the effects of GW, AR, and OLD are presented in Table 4 and it can be seen that the levels of students' knowledge about the effects of these three topics are similar. Results indicated that no students had informed views about the effects of these three environmental problems. However, most of the 7th (%67.09) and 8th grade students (%62.73) had transitional views about the effects of GW. For example, these students mostly emphasized that GW mainly caused the melting of glaciers and sea-level rise. Some students reported that GW negatively impacted everything such as human life, plants, animals, etc., but couldn't explain how GW damaged. On the other hand, %32.91 7th and %37.27 8th grade students held many misconceptions that GW directly triggered great disasters such as huge earthquakes and volcanoes and there was a direct relationship between GW and the other environmental problems such as AR, OLD, etc. These students emphasized that GW had an important role in the formation of AR and OLD. Interestingly, some students claimed that GW caused communication devices such as the internet, telephone to slow down.

Table 4: Findings on secondary school students' knowledge level about the effect of GW, AR, and OLD

Level	Grade	GW	AR	OLD
Informed View	**7th**	0 (%0)	0 (%0)	0 (%0)
	8th	0 (%0)	0 (%0)	0 (%0)
Transitional View	**7th**	212 (%67,09)	147 (%46,52)	180 (%56,25)
	8th	202 (%62,73)	169 (%52,48)	145 (%45,03)
Naive View	**7th**	104 (%32,91)	169 (%53,48)	136 (%43,04)
	8th	120 (%37,27)	153 (%47,52)	177 (%54,97)

For the effects of AR, %46.52 7th and %52.48 8th grade students had partial understandings (Table 4). They in general portrayed and reported that when AR fell to earth, it could damage many things on earth such as plants, animals, historical monuments but not with the appropriate reasons of how it affects them. On the other hand, remaining 7th and 8th-grade students seemed to believe various misconceptions about the effects of AR. For example, many students argued that AR directly triggered the formation of GW, OLD, etc. because it increases the acidity of water, air, and soil. Some students also stated that AR was the essential cause of the extinction of species such as humans, plants, etc. When it comes to OLD, Table 4 indicates that %56.25 of 7th and %45.03 of 8th-grade students had partial understandings, while the remaining of the 7th and 8th-grade students had naïve views about the effects of OLD. The students with naive understandings mostly believed that the temperature of the atmosphere increased due to OLD because depletion of the ozone layer allows more sun rays to reach the earth. Many students reported that OLD caused global disasters such as AR, GW, flood, hurricane, etc. Figure 3 presents some drawings of students about the effects of GW, OLD, and AR.

Global Warming- 8th grade student	Global Warming-7th grade student
	
Ozone Layer Depletion- 8th grade student	Ozone Layer Depletion- 7th grade student

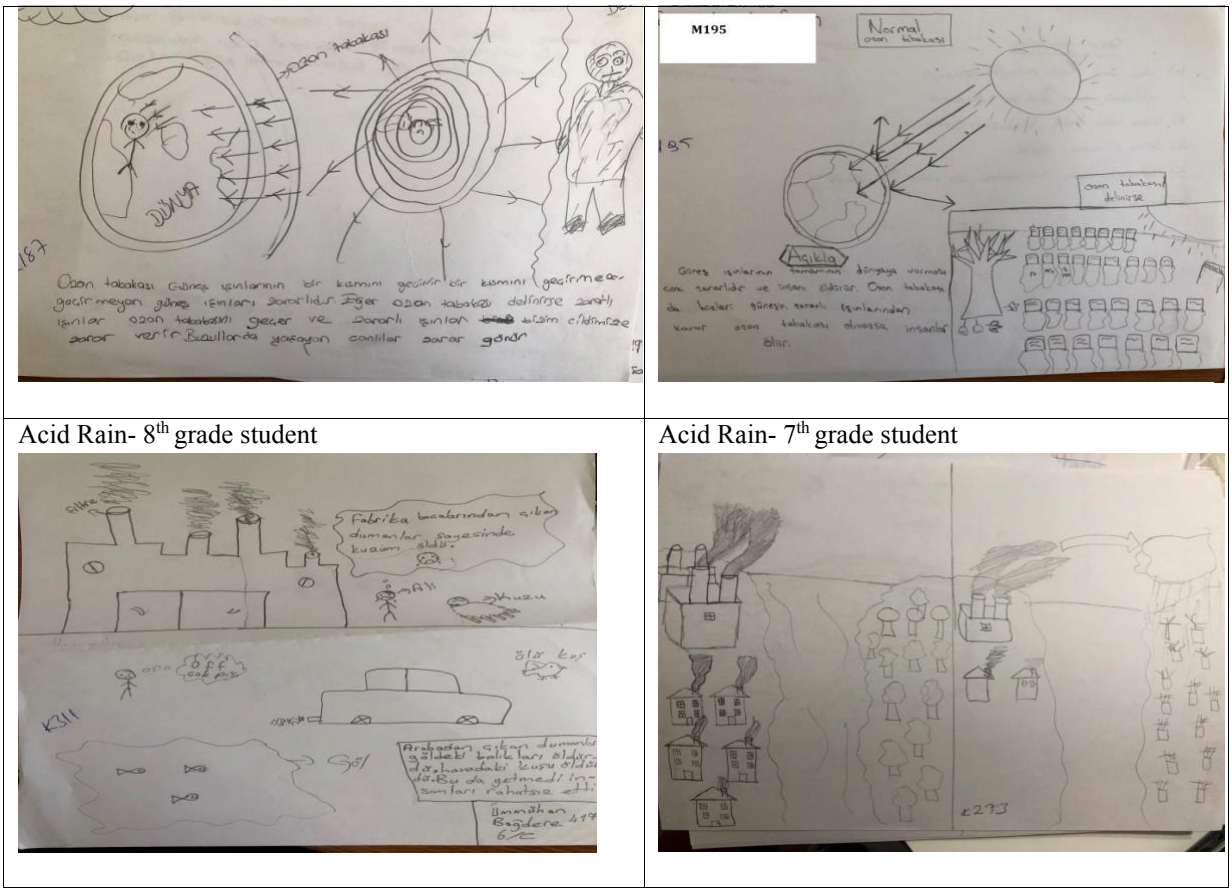


Figure 3: Some drawings of students about the effects of GW, OLD, and AR

3.1.4. What is the level of secondary school students' knowledge about how to prevent GW, AR, and OLD?
Results indicated that no students had informed views about how to prevent GW, AR, and OLD (Table 5). As shown in Table 5, it was understood that most of the 7th (%89.24) and 8th grade students (%91.61) held naïve views about how to prevent GW, while the remaining of the students had transitional views. The students with naïve views in general emphasized that global environmental problems, especially OLD must be prevented because this environmental problem is in particular responsible for GW. Some students argued that one of the best ways to prevent GW was to prohibit the missiles launched into space and nuclear tests. Few students suggested that legal regulation to reduce the use of perfumes and deodorants is essential for preventing GW. The students with transitional views mostly mentioned the planting of trees, the installation of filters on factory and vehicle exhaust, and the use of alternative energy sources. However, they couldn't give any response to the question of "what function these proposals have in preventing global warming".

Table 5: Findings on secondary school students' knowledge level of how to prevent the GW, AR, and OLD

Level	Grade	GW	AR	OLD
Informed View	**7th**	0 (%0)	0 (%0)	0 (%0)
	8th	0 (%0)	0 (%0)	0 (%0)
Transitional View	**7th**	34 (%10,76)	26 (%8,23)	38 (%11,88)
	8th	27 (%8,39)	19 (%5,90)	65 (%20,19)
Naive View	**7th**	282 (%89,24)	290 (%%91,77)	278 (%87,97)
	8th	295 (%91,61)	303 (%94,10)	257 (%79,81)

Table 5 shows that the majority of 7th (%91.77) and 8th-grade students (%94.10) had various misconceptions or no knowledge about how to prevent AR such as harmful gases such as CO, CO_2 must be reduced. Some students had no knowledge about it. Another result of the study was that the minority of 7th and 8th-grade students had transitional views about how to prevent OLD. Results also indicated that most of 7th (%87.97) and 8th (%79.81) held various misconceptions about how to reduce or prevent OLD, which is similar to their suggestions on the topics of AR and GW. Figure 4 presents some drawings of students about how to prevent GW, OLD, and AR.

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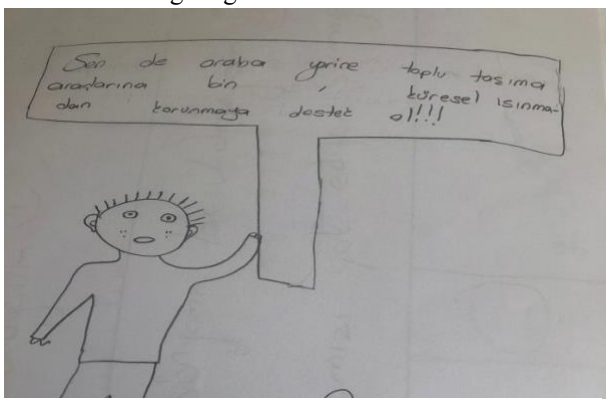
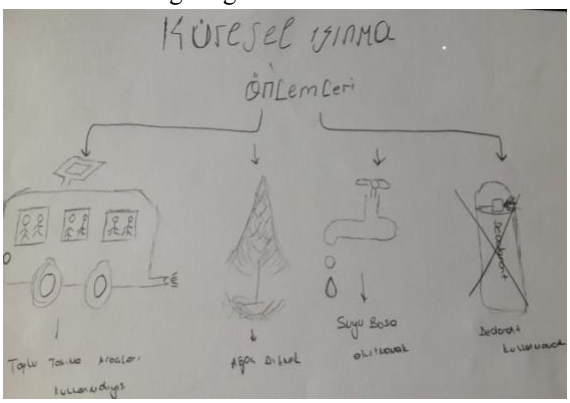
<tr><td>  </td><td>  </td></tr>
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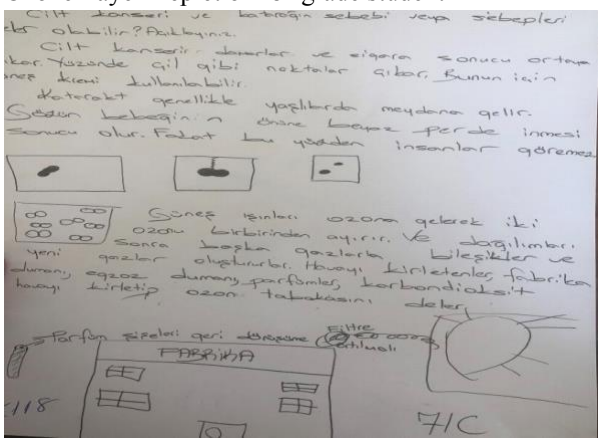
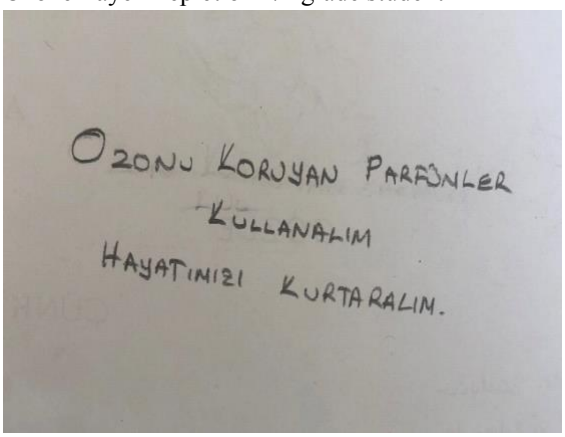
<tr><td>  </td><td>  </td></tr>
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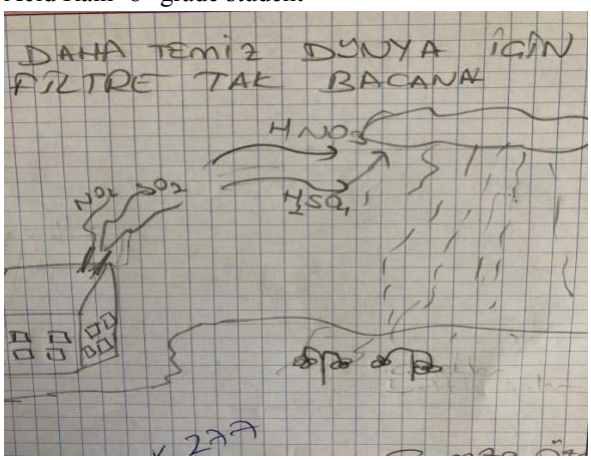
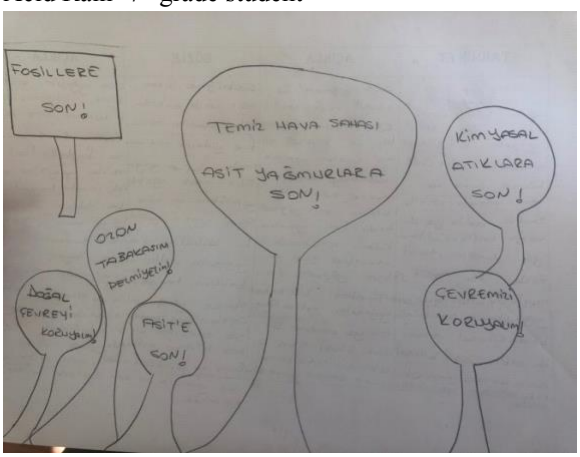
<tr><td>  </td><td>  </td></tr>
</table>

Figure 4: Some drawings of students about how to prevent GW, OLD, and AR.

3.2. Is there a statistically significant relationship among the levels of secondary school students' knowledge about the topics of GW, AR, and OLD?

Table 6 indicates that there was a weak correlation between the levels of secondary school students' knowledge about GW and OLD (r=0.146, p=0.000), while there was no significant relationship between the levels of secondary school students' knowledge about GW-AR (r=-0.009, p=0.812) and AR-OLD (r=-0.027, p=0.493).

Table 6: Relationships between the levels of secondary school students' knowledge about GW, AR, and OLD

	GW	AR	OLD
GW	--		
AR	-.009	--	
OLD	.146**	-.027	--

**$p < .01$

3.3. Are there significant differences in the level of secondary school students' knowledge of GW, AR, and OLD by the grade level of secondary school students?

MANOVA results are presented in Table 7. The results MANOVA, as shown in Table 7, indicated that there was a statistically significant difference between 7th and 8th-grade students for all variables (p=0.000). Based on Cohen's (1988, pp. 283–288) interpretation of the strength of partial eta squared values into three levels—0.01 (small effect), 0.06 (moderate effect), and 0.14 (large effect) —this value (η^2=0.18) indicated that the magnitude of significant difference between 7th and 8th-grade students with respect to the level of the students' knowledge about GW, AR and OLD was large.

Table 7: MANOVA Results

		Value	F	Hypothesis sd	Error df	p
Group	Wilks' Lambda	0.657	110.346	3.000	634.000	0.000

The results of ANOVA presented in Table 8 indicated that there was a statistically significant difference with respect to the students' knowledge GW (p<.001), AR (p<.001), and OLD (p<.001) between 7th and 8th grade. The post-hoc comparisons indicated that there was a significant increase (p<.001) in the mean scores of students' knowledge of GW from 8th to 7th-grade students (Table 8). With respect to the topics of AR and OLD, there was a significant difference (p<.001) in favor of 8th-grade students (see Table 9).

Table 8: Results of ANOVA for 7th and 8th grades of the students' knowledge about GW, AR, and OLD

Source of Variance	Dependent Variable	Sum of Squares	sd	Mean of Squares	F	p
Group	GW	81.493	1	81.493	197.671	0.000
	AR	2.235	1	2,235	43.737	0.000
	OLD	4.782	1	4.782	69.314	0.000
Error	GW	262.200	636	.412		
	AR	32.502	636	.051		
	OLD	43.877	636	.069		
Total	GW	505.400	638			
	AR	50.980	638			
	OLD	66.370	638			

Table 9: Descriptive statistics of the 7th and 8th grades students with *post hoc* comparisons for the students' knowledge about GW, AR, and OLD

	Group	N	Mean	Post-hoc
Global Warming	7th grade (1)	316	0.86	2<1
	8th grade (2)	322	0.14	
Acid Rain	7th grade (1)	316	0.10	1<2
	8th grade (2)	322	0.21	
Ozone Layer Depletion	7th grade (1)	316	0.08	1<2
	8th grade (2)	322	0.25	

4. Discussion

The results indicated that the levels of students' knowledge about GW, AR, and OLD were low and most of the students had various misconceptions about these three topics such as especially "CO_2 is one of the harmful-toxic gases and responsible for AR and OLD as well as GW" ozone layer is the physical layer that protects around the earth", "there was a hole in the ozone layer in a physical meaning", "GW, AR, and OLD directly affect each other and any of these environmental problems cause the other two to occur" etc. There are several reasons why the students have misconceptions regarding these common environmental problems. First, the fact that the topics of GW, AR, and OLD are both complex and abstract makes it difficult for these topics to understand and teach (Boyes, Chambers, and Stanisstreet, 1995; Dove, 1996). It can be said that one of the reasons for these misconceptions may be the animations, videos, and visuals on the internet, magazines, and books (Shepardson, Niyogi, Choi, and Charusombat, 2011) or environmental information from unofficial and unreliable sources. For example, the visuals of the ozone layer in these resources evoke the concept of "layer" in the minds of students in the physical meaning. Khalid (2003) claimed that the media influences the students' views and thinking about these environmental problems and there is an important role of media on the students' misconceptions. For example, CO_2 is mentioned as a 'bad or toxic' gas in the media, which causes the students to think of it only as a harmful gas rather than one of the greenhouse gases. It was also determined that the students explained the environmental problems with only a few concepts. For example, they stated that CO_2 gas was one of the main reasons for all environmental problems, or installing a filter to chimneys, and planting a tree would solve all three environmental problems. The fact that those topics are commonly included under the heading of "environmental pollution" or "environmental problems" in textbooks may be shown as a reason for this result, which may cause the students to confuse these topics. In a study of the levels of students' knowledge about GW, Boyes and Stanisstreet (1993) found that students had a general awareness of environmental issues, but had difficulty in establishing cause-effect relationships among these environmental problems. With respect to the effects of GW, AR, and OLD, the students were found to be more informed compared to other dimensions of these topics, which is due to the fact that these environmental issues are up-to-date is more likely and more concrete for students to encounter in daily life (TV, internet, magazines, documentaries, etc.). The findings of some research (e.g., Boyes and Stanisstreet, 1994; 1997) support these results. Contrary to this finding, the results indicated that the students' knowledge about how to prevent the GW, AR, and OLD was more inadequate than the other dimensions of these three environmental problems. They commonly considered that installing filters in chimneys, planting trees is the ones of the best ways to prevent these issues. The results of Pearson Correlation indicated that there was a statistically relationship between GW and OLD, however there was no relationship between AR-OLD and AR-GW, which can be explained by the fact that students confused the topics of OLD and GW more than acid rain. This means that the students who had more appropriate knowledge in any of the topics of GW and OLD had a better understanding of another topic or vice versa. These statistical results were further supported by evidence from qualitative analyses of the data obtained from drawings and open-ended questions. The results of MANOVA also indicated that there was a significant increase in the mean scores of students' knowledge of GW from 8th to 7th-grade students, while there was a significant difference in favor of 8th-grade students with respect to the topics of AR and OLD.

Consequently, the results of this study provide evidence that Turkish secondary school students have not developed an appropriate conceptual understanding of the topics of GW, AR, and OLD. In the light of this study's findings, we may suggest that there is a need for more studies for exploring and developing the secondary school students' knowledge about these global environmental problems, especially for providing our students to be sensitive to the environment and to actively engage them in decisions regarding environmental issues. The results of this study also imply that environmental science courses dealing with current and future environmental problems such as the GW, AR, and OLD should be comprehensively added to science curricula as compulsory courses.

4.1. Limitation of the Study

In this study, in order to determine the students' knowledge level of these environmental problems, only open-ended questions and drawings were used as data collection tools. Also, the sample of this study is limited to only 7th and 8th-grade students.

References

Andersson, B., & Wallin, A. (2000). Students' understanding of the greenhouse effect, the societal consequences of reducing CO_2 emissions and the problem of ozone layer depletion. *Journal of Research in Science Teaching: The Official Journal of the National Association for Research in Science Teaching*, *37*(10), 1096-1111.

Aydemir S., Kaya O.N., Karakaya D., Gül E., Sungur S., Fizan A. (2010). İlköğretim Öğrencilerinin Asit Yağmurlarına İlişkin Kavramsal Anlama Düzeyleri (Poster Sunumu). *IX. Ulusal Fen Bilimleri ve Matematik Eğitimi Kongresi,* Buca-İZMİR.

Boyes, E., Chambers, W., & Stanisstreet, M. (1995). Trainee primary teachers' ideas about the ozone layer. *Environmental Education Research*, *1*(2), 133-145.

Boyes, E., & Stanisstreet, M. (1992). Students' perceptions of global warming. *International Journal of Environmental Studies*, *42*(4), 287-300.

Boyes, E., & Stanisstreet, M. (1993). The 'Greenhouse Effect': children's perceptions of causes, consequences and cures. *International Journal of science education*, *15*(5), 531-552.

Boyes, E., & Stanisstreet, M. (1994). The ideas of secondary school children concerning ozone layer damage. *Global Environmental Change*, *4*(4), 311-324.

Boyes, E., & Stanisstreet, M. (1997). Children's models of understanding of two major global environmental issues (ozone layer and greenhouse effect). *Research in Science & Technological Education*, *15*(1), 19-28

Boyes, E., Stanisstreet, M., and Papantoniou, V (1999). The ideas of Greek high school students about the ''Ozone Layer''. Science Education 83: 724–737.

Clough, E. E., & Driver, R. (1985). Secondary Students' Conceptions of the Conduction of Heat: Bringing Together Scientific and Personal Views. *Physics Education*, *20*(4), 176-82.

Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education (6th ed.).* London: Routledge.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Cordero, E. (2000). Misconceptions in Australian students' understanding of ozone depletion. Melbourne Studies in Education 41: 85–97

Creswell, J. W., & Plano-Clark, V. L. (2007). *Designing and conducting mixed methods research.* Thousand Oaks, CA: Sage.

Dove, J. (1996). Student teacher understanding of the greenhouse effect, ozone layer depletion and acid rain. *Environmental education research*, *2*(1), 89-100.

Groves, F. H., & Pugh, A. F. (2002). Cognitive illusions as hindrances to learning complex environmental issues. *Journal of Science Education and Technology*, *11*(4), 381-390.

Hammer, D. (1996). Misconceptions or p-prims: How may alternative perspectives of cognitive structure influence instructional perceptions and intentions. *The Journal of the Learning Sciences*, *5*(2), 97-127.

Herman, B. C., Feldman, A., & Vernaza-Hernandez, V. (2017). Florida and Puerto Rico secondary science teachers' knowledge and teaching of climate change science. *International Journal of Science and Mathematics Education, 15*(3), 451-471.

Jafer, Y. J. (2020). Assessing Kuwaiti Pre-service Science Teachers' Greenhouse Effect Perceptions and Misconceptions. *International Journal of Science and Mathematics Education,* 18(4), 657-667.

Karakaya, D. (2012). *Fen bilgisi öğretmen adaylarının küresel boyuttaki çevresel sorunlara ilişkin teknolojik pedagojik alan bilgisi ve sınıf içi uygulamalarının araştırılması*. Yayımlanmamış yüksek lisans tezi, Fırat Üniversitesi, Elazığ.

Kaya, O. N. ve diğ. (2011). Fen Bilgisi Öğretmen Adaylarının Asit Yağmurları Konusundaki Teknolojik Pedagojik Alan Bilgisinin ve Sınıf İçi Uygulamalarının Araştırılması, Fırat Üniversitesi Bilimsel Araştırma Projesi (Proje No: 1844).

Khalid, T. (1999). The Study of Pre-Service Teachers' Alternative Conceptions Regarding Three Ecological Issues.

Khalid, T. (2001). Pre-service teachers' misconceptions regarding three environmental issues. *Canadian Journal of Environmental Education (CJEE)*, *6*(1), 102-120.

Khalid, T. (2003). Pre-service high school teachers' perceptions of three environmental phenomena. *Environmental Education Research*, *9*(1), 35-50.

Koulaidis, V., & Christidou, V. (1999). Models of students' thinking concerning the greenhouse effect and teaching implications. *Science Education*, *83*(5), 559-576.

Marinopoulos, D., & Stavridou, H. (2002). The influence of a collaborative learning environment on primary students' conceptions about acid rain. *Journal of Biological Education*, *37*(1), 18-25.

Mukherji, P. & Albon, D. (2015). *Research methods in early childhood: An introductory guide, 2nd ed*. London : SAGE.

Odom, A. L., & Barrow, L. H. (1995). Development and application of a two-tier diagnostic test measuring college biology students' understanding of diffusion and osmosis after a course of instruction. *Journal of research in Science Teaching*, *32*(1), 45-61.

Osborne, R. J., Bell, B. F., & Gilbert, J. K. (1983). Science teaching and children's views of the world. *European Journal of Science Education*, *5*(1), 1-14.

Papadimitriou, V. (2004). Prospective primary teachers' understanding of climate change, greenhouse effect, and ozone layer depletion. *Journal of Science Education and Technology*, *13*(2), 299-307.

Posner, G. J., Strike, K. A., Hewson, P. W., & Gertzog, W. A. (1982). Accommodation of a scientific conception: Toward a theory of conceptual change. *Science education*, *66*(2), 211-227.

Shepardson, D. P., Niyogi, D., Choi, S., & Charusombat, U. (2011). Students' conceptions about the greenhouse effect, global warming, and climate change. *Climatic Change*, *104*(3-4), 481-507.

Syibo, K. (1995). Using concept maps to analyze textbook presentation of respiration. The American Biology Teacher. 57, 344-351.

Thomas, G. V., & Silk, A. M. (1990). *An introduction to the psychology of children's drawings*. New York University Press.Vazquez-Alonso, A., & Manassero-Mas, M. A. (1999). Response and scoring models for the 'Views on Science-Technology-Society' instrument. *International Journal of Science Education*, *21*(3), 231-247.

Vazquez-Alonso, A., & Manassero-Mas, M. A. (1999). Response and scoring models for the Views on Science-Technology-Society instrument. *International Journal of Science Education*, *21*(3), 231-247.

Vosniadou, S. (1994). Capturing and modeling the process of conceptual change. *Learning and instruction*, *4*(1), 45-69.

Vosniadou, S., & Verschaffel, L. (2004). Extending the conceptual change approach to mathematics learning and teaching.

West, L. H., & Pines, A. L. (1985). *Cognitive structure and conceptual change*. Academic Pr.

White, R., & Gunstone, R. (1992). Prediction-observation-explanation. *Probing understanding*, *4*, 44-64

ASIAN INSTITUTE OF RESEARCH
Connecting Scholars Worldwide

The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 214-220
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.188

On the Teaching Reform of Translation Course Based on the Cultivation of Applied Talents

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Abstract
This article, taking the translation courses for English majors in Zhejiang University of Finance and Economics Dongfang College as an example, starts from the current teaching problems of translation courses in application-oriented colleges and universities. In order to clarify the teaching system, highlight the local characteristics, and find a way to adapt to the teaching objective of high-quality applied talents, this article establishes the teaching idea of "solid foundation, application-oriented and strong ability" and discusses the teaching reform of translation course by optimizing the teaching syllabus, teaching content, teaching mode, teaching method and evaluation system. The innovation of translation teaching reform mainly lies in the consistency, integration and effectiveness of the "Four-in-One" teaching mode which taking practical ability as the core, integrate the teaching objective, teaching content, teaching methods and teaching evaluation as a whole, so as to solve the existing problems of the translation course and follow the changes of social and economic development.

Keywords: Translation Course, Teaching Reform, Teaching Mode, High-Quality Applied Talents, Application-Oriented Colleges and Universities

1. Introduction

As China's "the Belt and Road" initiative and the Chinese culture's "Going Out" strategy are implemented recently, the importance of translation is increasingly prominent. Nowadays, there is a growing demand for English translators. Many industries are looking for professional and applied translators. How to cultivate a group of qualified translators to meet the market demand has become a serious problem for colleges and universities. Under the current socio-economic transformation and the development of higher education, independent college students are neither academic-oriented colleges, nor vocational colleges that mainly focus on the cultivation of operational skills. Therefore, how to effectively cultivate a number of high-quality application-oriented translation talents has become the focus of translation teaching in independent colleges. The

[1] **Fund Project:** Research Results of "On the Teaching Reform of Translation Course Based on the Cultivation of Applied Talents" of Teaching Reform Project of Ministry of Education of the People's Republic of China Industry and University Cooperation Program in 2020 (Project No.202002176001)

only way to solve this problem is to carry out the application-oriented teaching reform, which can deepen the current teaching reform of various colleges and universities, improve the practical application level of translation course, so as to build a modern translation teaching system. In the long run, there is no doubt that it can provide more suitable application-oriented translators for the society.

2. An Analysis of the Current Problems of Translation Teaching

With the deepening of the mechanism of social demand for talents training in colleges and universities, the importance of the ability training of English majors has become increasingly prominent. Domestic experts and scholars pay more attention to the research of translation teaching. However, on the whole, the theoretical and practical research of translation teaching is not systematic enough, and there are still many problems. Some scholars have studied the feedback of translation practitioners on translation teaching at school, and found that there are some problems, such as insufficient class hours, single translation teaching mode, disconnection between teaching materials and social needs (Gao Yan, 2016). Some scholars have also pointed out that "In the current process of translation talents training, there are still many deficiencies in the curriculum module setting, teaching mode, teaching management and assessment. And distinctive teaching system has not been formed, for example, the curriculum module setting of practical teaching is unreasonable: the practice inside the school pays more attention to theory than practice, the practice outside the school pays more attention to form than content, practical teaching management system is not perfect, and practical teaching evaluation system focuses on results rather than process" (He Hongli & Mo Aiping, 2016).

The emergence of these problems is bound to return to a fundamental problem: What are the basic requirements of the ability training of applied talents? The author believes that we should highlight the requirements of various application scenarios, including expression, communication and the ability to find and solve problems in practice, which is different from the training objectives of acquiring solid theoretical foundation of academic colleges and universities, as well as relatively simple skills of vocational colleges. With the deepening of the mechanism of social demand for talent training in colleges and universities, the requirements of translation ability training for English majors in application-oriented colleges and universities are also constantly improving (Hu Pengzhi, 2015). Although those colleges and universities are carrying out reform in recent years, on the whole, there are still many problems which are not coordinated with the ability training in translation teaching.

According to our research, the main problems are as follows: first, the teaching mode of emphasizing theory and neglecting practice is still relatively common. The main reason is that the teaching syllabus does not highlight the application-oriented teaching objectives, which leads to the fact that the translation curriculum system is still inclined to academic purposes. Second, the teaching content cannot meet the needs of today's social and economic development and students' employment needs. The main reason is that the content of the course focuses on academic theory, and there are few contents facing the reality of social economy. Third, there are few applied translation textbooks for undergraduates, most of which focus on translation theory and literary translation. This kind of teaching material cannot adapt to the characteristics of English majors in independent colleges, nor can it meet the requirements of improving students' practical ability. Fourth, off-campus practical teaching pays more attention to form than content which fails to solve the practical problems. Fifth, the course assessment emphasizes the end of the term but ignores the process. Such an assessment method will inevitably lead to a single teaching mode, which is not conducive to improve the enthusiasm of students in the learning process or the promotion of practical teaching.

The above-mentioned problems neglect the cultivation of students' translation ability, which makes it difficult for students to adapt to the needs of translation practice after graduation. In view of this, we must take the initiative to explore the market-oriented teaching reform of translation course for English majors and vigorously promote the cultivation of high-quality applied translation talents to meet the needs of economic and social development.

3. Teaching Idea of Translation Course

Teaching activities that are not completely consistent with the teaching idea should be reformed. The idea of teaching reform of translation course is: "Guided by the training goal of high-quality applied talents in our college, based on the foundation of English language, with application ability training as the core and practical teaching as the approach," that is, "solid foundation, application-oriented and strong ability." In order to ensure the basic theoretical literacy of undergraduate specifications, we should highlight the practical ability. Facing the local economy and society, we should take the initiative to undertake the translation tasks of foreign affairs, publicity and product promotion of local enterprises, institutions and industries, so as to provide more translation practice opportunities for students to improve the practical ability.

4. Teaching Reform of Translation Course under the Cultivation of High-quality Applied Talents

4.1 Optimizing the Teaching Syllabus and Teaching Contents

Each school has its own training objectives. Application-oriented universities should follow the talent training concept of "focusing practical ability" (Dong Yi & Zhou Zhihu, 2010). Based on the target of talent cultivation, the curriculum syllabus is revised to highlight the teaching objectives and adjust the teaching contents. First of all, we should get familiar with the employment requirements of the job market for translators, optimize the teaching objectives reasonably, change the traditional inertia of emphasizing knowledge and neglecting practice, and cultivate application-oriented talents with practical ability.

Secondly, we should revise the syllabus comprehensively, optimize the teaching objectives, adjust the theoretical hours of the course, increase the extracurricular practice teaching hours, and focus on the cultivation of practical ability in accordance with school's requirements of training high-quality applied talents. For English major, we should strengthen the training for the qualification examination; for double majors, we should strengthen the construction of courses related to computer and translation tools when teaching conditions permit.

Finally, the textbook of translation course should be updated in time. The textbook with new content, strong professionalism, moderate difficulty and reasonable system can be selected. At present, more than 90% of the world's translation is practical translation. Therefore, the compilation of translation textbooks should fully reflect the needs of political, economic, technological and cultural development. In the design of text structure, it should fully reflect the translation of economic, social, technological, diplomatic, legal, news and other practical texts, and strengthen students' translation practical training so as to lay a solid foundation for their future work (Rong Linhai & Li Jing, 2010).

Taking the author's college as an example, since there is no textbook suitable for students in our school, our teachers have compiled a school-based textbook suitable for our students, taking full account of the market demand and the characteristics of students. This textbook includes not only the professional knowledge of translation required by students for employment, but also includes the content of improving students' practical ability, appropriately adding materials related to the characteristics of local economic development.

4.2 Optimizing the Practical Teaching Mode and Multiple Teaching Methods

Teaching mode is an important element to achieve the teaching objective of the course. The focus of cultivating high-quality applied talents is to improve students' skills to solve practical problems. Therefore, we should explore diversified teaching modes. English language ability, translation practice ability and translation service ability are not acquired in the traditional teacher-centered teaching mode, so it is urgent to reform the current teaching mode (Zhou En, 2016). We have put forward a "Four-in-One" teaching mode, that is, taking practical ability as the core, integrate the teaching objective, teaching content, teaching methods and teaching evaluation as a whole, so as to solve the existing problems of the translation course.

Besides reforming the teaching mode, we should also improve the teaching methods. Taking the translation teaching of junior students in my college as an example, this article discusses the project-based translation teaching method, which is student-centered and aims at the cultivation of translation practice and service ability. After teachers' explanation of the translation theories and strategies, the students will practice translation through the translation projects. The project requires students to work in groups and use the translation materials provided by the teacher from translation companies in Hangzhou City to complete the translation task and produce the final product, as well as to write the translation project report including key points and difficulties in the process of translation. By this way, students can be familiar with the process of translation projects, consolidate the basic theory of translation, and check the mastery of translation strategies. Through translation diary, self-evaluation and mutual evaluation, group discussion and other forms, the translation projects can cultivate students' ability of analysis, reasoning and evaluation. In the process of translation project, students learn not only theoretical knowledge and translation skills, but also the ability to acquire new knowledge and cooperate with others. In the learning process, it is necessary to inculcate the concept of "translation ability is not taught, but practiced", and to cultivate students' autonomous learning ability (Zhong Xiao, 2015).

We should make full use of the network platform to carry out online and offline mobile classrooms and arrange necessary time for experience and practical learning. We should also use modern teaching technology, such as online school, rain classroom, flipped classroom, cloud classroom, etc. Using task-based and interactive teaching methods attracts more students to participate in classroom teaching activities and after-school tasks. Taking the translation course of author's college as an example, the teaching method of mobile classroom with flipped classroom plus experiencing teaching is implemented. For example, when talking about the chapter of tourism culture translation, we used the form of mobile classroom to organize students to visit South Lake in Jiaxing City, Yanguan Ancient Town in Haining City and Chang'an Party Service Center. During the visit, we arranged tasks for students. Every student is required to find and correct the mistakes in translation as well as the names of exhibits that lack translation. Students can get their own translation by consulting some materials and discussing with each other as well as consulting teachers on online, and then display their results in the class through text, pictures, audio and video, so as to effectively realize interactive teaching in the class. The teacher explains the typical translation problems of the students, so that the students can find their own shortcomings. This method can stimulate the students' interest in learning, and improve the students' conversion ability of translation.

The training goal of translation course is to improve students' applicability and practicability. This requires the cultivation of high-quality applied talents who can serve the local economy (Sun Wenyuan & Dai Congteng, 2016). Therefore, it is necessary to strengthen the extracurricular translation practice teaching characterized by local translation so as to cultivate students' practice ability. Through the establishment of translation practice base, simulation translation laboratory and other ways to fully develop learning resources and practical training conditions, which help students to apply classroom knowledge to practice and feed back the problems encountered in practice to teaching.

Taking the author's college as an example, the teaching of translation course is oriented to the local economy and society. Through the school-enterprise cooperation, we actively undertake the translation tasks of Haining foreign affairs, publicity, product promotion, etc. We organize junior students to participate in a lot of volunteer activities, such as the volunteers of the World Internet Conference held in Wuzhen, the World Garden Conference held in Haining, 2019 FIBA 3 * 3 International Basketball Competition, etc. We provide students with good opportunities for translation practice by interpreting for foreign visitors. It is conducive to cultivating students' translation ability and adaptability, and improving the effectiveness of translation teaching. At present, the translation course of our college is directly linked with professional practice, such as graduation internship, graduation thesis and other practical activities which have become an important part of the practical course learning of students at school. In recent years, the number of students who choosing translation projects for graduation thesis is increasing year by year. This year, due to the epidemic, the online translation practice activities are taken as the main content of graduation internship.

4.3 Optimizing the Evaluation System

Teaching quality is an endogenous driving force of teaching reform, and teaching evaluation is an important means to guarantee teaching quality. Through assessment and evaluation, teachers can check the teaching effect of the course, so as to adjust the teaching plan in time. Students can also check their mastery of knowledge and improve their learning methods. For the assessment of translation course, we should change the traditional evaluation method and gradually form a scientific and reasonable formative evaluation system which can really play a positive leading role in teaching. Taking the evaluation system of translation course in the author's college as an example, we change the current situation that the final examination is used to determine the total score. Formative assessment constitutes 60% of the total score, which is composed of students' performance, homework, translation projects and bonus points for scientific research and innovation. The content of translation project includes project report (20%), project statement (30%), final product (35%) and team cooperation and performance (15%). At the same time, a course reward mechanism is set up for students who are given certain course rewards through translation training, competition, scientific research and other activities. For example, students who participate in translation research projects, write and publish related papers, and win prizes in translation competitions will be awarded 1 to 5 points. The purpose is to cultivate students' translation practice and scientific innovation ability by encouraging students to participate in translation competitions, research projects and other activities.

The developmental assessment mode is adopted to solve the problem of emphasizing the final examination and neglecting the process. To evaluate from multiple perspectives, we should attach importance to both summative assessment and formative assessment (Wang Shuhuai & Wang Weiping, 2010). First of all, when commenting on students' translation exercises, students' attitude towards translation learning, their mastery of translation skills and theories and the handling of translation problems are integrated to be considered. We should listen to the opinions of students, pay attention to the interaction between teachers and students as well as the interaction between students. The students should conduct their translation projects in the form of group activities. During their translation projects, they should cooperate with each other, and carry out self-evaluation and mutual-evaluation. Secondly, we should focus on students' subjectivity and creativity, and evaluate students' sense of responsibility and self-confidence in learning. We should not only evaluate the students' theoretical knowledge and translation ability, but also their sense of responsibility for spreading Chinese culture to the world. In the context of globalization, we should help students to understand the different values and ways of thinking between China and the West, and to interpret and translate in the most appropriate way (Fang Mengzhi, 2013). Thirdly, the evaluation content should be diversified to help students eliminate the fear of final examination, and build up their self-esteem and self-confidence. We should evaluate students' translation ability and also their all-round development ability.

In addition to teachers' evaluation of students, students also need to evaluate teachers' teaching. Teachers' weak vocational level directly affects the quality of teaching. Therefore, improving teachers' specialty becomes the key to cultivate high-quality applied translation talents. The construction of a team is not only the need for deepening teaching reform, but also the core of translation teaching. Most of the teachers graduated from foreign language department and lack professional knowledge of economy, trade, law information, etc. However, teachers who know professional knowledge have relatively weak foreign language proficiency. Therefore, it is urgent to cultivate a team of double qualified teachers. For example, the author's college is currently exploring the mode of English teachers taking temporary posts in enterprises and translation experts who work in foreign trade enterprises teaching in college, which is very beneficial to the cultivation of high-quality applied translators.

5. Innovation of Teaching Reform of Translation Course

After three years of reform and practice, the results of the reform have been gradually shown. The innovation of translation teaching reform mainly lies in the interconnection, integration and effectiveness of the "Four-in-One" teaching mode.

5.1 The Consistency of "Four-in-One" Teaching Mode

The teaching reform, based on the students' mastery of translation theory knowledge, with the cultivation of students' bilingual conversion ability and translation practical ability as the core, carries out all-round training on students' ability to solve practical problems. Ensure that online and offline classroom learning, experiencing teaching and practical training are connected.

5.2 The Integration of "Four-in-One" Teaching Mode

The teaching objective, teaching contents, teaching methods, teaching evaluation and other elements are organically combined. Through the teaching idea of "based on the foundation of English language, with application ability training as the core and practical teaching as the approach," all parts are organically integrated. At the same time, a whole process teaching quality evaluation mechanism is established. As an important basis for the adjustment and improvement of the teaching mode, it forms a circulation system of interconnection and integration among various parts.

5.3 The Effectiveness of "Four-in-One" Teaching Mode

In the past three years of practice, students' translation ability has been improved, and the results of related scientific research, competition and other achievements have become more and more prominent. From the initial experiment of one class to the current implementation of different grades and classes, the teaching effect is remarkable. Students generally reflect that their translation application ability and practical ability have been greatly improved. And the number of translation volunteers and social evaluation of our students have been continuously improved. The number of winners of translation competitions, the number of students who have passed the translation certificates and the number of graduates who have worked as translators have been increasing year by year.

Conclusion

The cultivation of high-quality applied talents is not only the need of market development, but also the need of students' self-development. Translation, as a practical course, is consistent with the requirements for training applied talents. The translation course should closely follow and adapt to the changes of social and economic development. Translation teaching should explore a set of feasible and effective teaching reforms to improve the theoretical system of translation teaching and the quality of professional training. At the same time, it is necessary to adjust the teaching content of the course according to the needs of enterprises and industries, and cultivate the compound talents suitable for foreign language translation in a certain industry. The reform in the past three years has improved the teaching objective centered on the cultivation of high-quality applied talents, enriched the teaching methods and formed a relatively effective teaching mode of translation course. As an applied technology-based college in the period of transformation and development, our college had already established a good teaching reform to meet the needs of regional economic and social development, and cultivate high-quality translation talents required by the market.

References

Dong Yi & Zhou Zhihu. Research on the Optimization of Higher Mathematics Curriculum Reform from the Perspective of Applied Talents Training [J]. *China University Teaching*, 2010,115 (8): 54-56.

Fang Mengzhi. A New Starting Point of Applied Translation Studies[J]. *Shanghai Journal of Translators*, 2013 (3): 32-74.

Gao Yan. Translation Teaching Reform Guided by Market Demand: a Case Study of School of Foreign Languages in Southwest University of Science and Technology[J]. *Shandong Youth*, 2016,132 (4): 43-44.

He Hongli & Mo Aiping. Research Report on Practical Teaching of Translation Major [J]. *Foreign Languages in China*, 2016, 85 (2), 4-11.

Hu Pengzhi. Construction and Acquisition of Translation Ability [M]. Hunan: Hunan University Press, 2015.

Sun Wenyuan & Dai Congteng. Research on the Training Mode of Skilled and Applied Translators under the Cooperation between School and Enterprise [J]. *Shanghai Journal of Translators*, 2016 (3): 72-76.
Wang Shuhuai & Wang Weiping. Developmental Translation Teaching Evaluation Model [J]. *Journal of PLA University of Foreign Languages*, 2010 (5): 76-81.
Rong Linhai & Li Jing. Translation Textbook Compilation Concept under the Guidance of Applied Foreign Language Talents Training Mode [J]. *Foreign language World*, 2010,137 (2): 25-29.
Zhou En. Exploration of Professional Translation Talents Training based on the Professional Needs of Medical Translation [J]. *Technology Enhanced Foreign Languages*, 2016,171 (5): 90-96.
Zhong Xiao. Innovating Translation Teaching Mode and Cultivating Applied Translation Talents [J]. *College English Teaching and Research*, 2015, 77 (4): 27-29.

The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 221-234
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.189

The Structural Model of Indicators of Educational Leadership for Primary School Principals

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Abstract
This research aimed at creating a structural model of the indicators of Educational Leadership for Primary School Principals in Thailand, which is considered to be a theoretical model that has been used to test for coherence with the empirical data collected from a sample group of 580 participants, who were selected from 30,719 Primary School Principals from across the country. To create this theoretical structural model, a study of the suitability of the indicators was carried out so that it could be further used in the selection within the model, as well as in the model's coherence test with the empirical data and in the investigation of the factor loading. The results of the research were as follows: Firstly, all indicators, which had been applied in the research were selected and were then placed into the theoretical structural model because the average and distribution coefficient values were as set in the criteria. Secondly, the theoretical model is coherent with the empirical data as the values of relative Chi-square, Root Mean Square Error of Approximation, Goodness-of-Fit Index, Adjusted Goodness-of-Fit Index, Comparative Fit Index, and Normed Fit Index were as set in the criteria. Finally, the factor loadings of the key elements, sub-elements, and the indicators were as set in the criteria. This showed that the theoretical model from this research can be beneficial for the research population with construct validity.

Keywords: Indicators, Educational Leadership, Primary School Principals

Background

Humanity has progressed from an industrial society in 19th and 20th centuries to a knowledge-based society in 21st century in which changes happen quickly because of the usage of technology to globally connect with data. The driving force of digital technology is causing rapid changes. These changes are, in fact, so rapid that the academics see this as only the beginning. In the future, the speed will increase dramatically (Sanrattana, 2018), and such changes will inevitably influence changes in education as well. Schools, therefore, need to be active and ready to prepare students with the essential skills to survive in today's world (Driscoll, 2020). School Principals are the key mechanism in the process of high-quality and efficient educational management in schools as a result of their quality administration. Hence, the School Principals in 21st century are required to have educational leadership, theoretical knowledge, skills, responsibilities, and experiences in the aspects of educational administration in this era) Dowd, 2018; Behbahani, 2011). Lathan (2021) stated that if school principals lack educational leadership, they will not be able to solve the school's problems and will fail to get ready for the competition in this new era.

There are discussions about Educational Leadership Models from many figures, such as University of Western Sydney (2007); Elias (2011); Morrison (2013); Brooke (2013); Keenan (2013); Richardson (2014); Meador (2015); Kitendo (2016); Driscoll (2016); Wagner (2016); Money-Zine Website (2016); Concordia University (2017); New Zealand Ministry of Education (2017); and Sutcliffe (2017), etc. These are also the important references, which have been used in this research as the theories to establish the key elements and sub-elements of each key element, as well as the indicators of each sub-element. From these sources, they have then been proposed as "The Structural Relationship Model of Indicators of Educational Leadership for Primary School Principals," which has been employed in this research.

This model is considered as a theoretical model or hypothetical model, which was tested with the empirical data in order to determine its fit in accordance with the criterion or with the lack thereof. If the result was positive, the model could be used in the educational administration of the research population with construct validity. According to Wiratchai (2002), a model after the test will have the quality in data reduction in a form that is easily used resulting in a reduction of the complicity of the data, which is the inference of data management. This will also be used to follow, review, and make decisions at the departmental, organizational, or national level.

Objectives

This research aimed at creating a theoretical model, which shows the structural relationship between the key elements of Educational Leadership with the sub-elements of each key element and the indicators of each sub-element. There was also an investigation of the indicators, which were developed with respect to their suitability to be selected and to be put in the model before testing the model with the empirical data. In addition, there was an investigation of the factor loading of the key elements, sub-elements, and the indicators in accordance to the criteria.

Research Hypothesis

To create this theoretical model, the researcher studied theories from various sources to determine the key elements, sub-elements, and the indicators to be used in the research. Therefore, the following would be the predicted answers:1) the indicators used in the research are suitable with the theoretical model as set in the criterion, 2) the theoretical model fits with the empirical data as set in the criterion, and3) the factor loading of the key elements, sub-elements, and indicators are as set in the criteria.

Research Methodology

Wiratchai (2002 (has discussed the three ways in which to develop educational indicators:**1) Pragmatic definition** is the way in which the researcher applies his/her own experiences when selecting the variables to present in a model.**2) Theoretical definition** is a way in which a researcher applies theories and other model creation research to present a model for ready-to-use purposes, or the experts investigates the model before using it. **3) Empirical definition** is the way in which a researcher applies theories about model creation and then tests the model with empirical data. If there is a coherence from the Confirmative Factor Analysis, the model can be used in managing and developing human resources and the organization. This research applied the empirical definition in the development of the indicators, which Sanrattana (2018) sees as a more logical way than other ways because of the use of the empirical data, which is collected from the sample group and which consists of choosing randomly selected participants to determine the construct validity without involving the personal feelings and experiences of the researcher or the experts. The details of the research methodology are as follows:

Population and Sample Group

The population of the research was 30,719 Primary School Principals under the Office of the Basic Education Commission in Thailand. The determination of the sample size was based upon the ratio rule between the sample

unit and the parameter of 20:1 in accordance with Gold (1980). Free parameter was used to determine the value of the parameters because the model of this research is a confirmatory factor analysis model among variables with an influence line. The parameters were comprised of five latent variables, 13 observed variables, and 17 influence lines, which made 35 parameters in total and which then resulted in having 700 participants in the sample group.

Research Tools

The research tool was a questionnaire, which was divided into two parts. The aim of the first part was to investigate the status of the informants consisting of information about gender, age, school size, educational background, and work experiences. The second part had 60 questions consisting of the indicators of Educational Leadership, which had been categorized in accordance with the key elements and sub-elements in the form of a 5-rating scale: The Most, Much, Medium, A Little, and The Least.

The Creation and Quality Investigation of the Tools

Because the researcher chose to apply the Empirical definition, which represents a way in which a researcher can apply model creation theories, the creation of the research tool originated from the study of theories, which were utilized to synthesize and determine the key elements, the sub-elements of each key element, and the operational definitions, which were connected to the indicators, which determined each of the sub-elements, and which further led to creation of the questions from the indicators.

The 60 questions in the questionnaire were tested for Index Of Congruence: IOC with the indicators and operational definitions by three experts in Educational Administration and two experts in Evaluation & Assessment. The result was that the value of IOC was more than 0.50 for every question, which indicated that the questions were coherent with the indicators and the operational definitions.

The completed version of the questionnaire was used as a 'try-out' with 30 primary school principals, who were not a part of the sample group. The collected data was analyzed for alpha coefficient of reliability using Cronbach's approach. It was found that the questionnaire had 0.976 as alpha coefficient of reliability. In the following key elements, the values were as follows: "Having Vision" (0.933); "Communication Skills" (0.936); "Inspiration" (0.946), and "Commitment" (0.938). This showed that the questionnaire had a higher alpha coefficient of reliability than the set criterion which was 0.70)See the questionnaire in the Appendix.(.

Data Collection

Multi–stage random sampling was used to select 700 participants from 30,719 Primary School Principals. The questionnaire was sent to the participants by mail; 580 copies were returned (82.85%). This was enough to be used in Confirmatory Factor Analysis because Kaiser-Mayer-Olkin Measurers of Sampling Adequacy of each model's key element assessment were between 0.933 - 0.976, which was higher than the criterion (0.80)) Cerny & Kaiser, 1977).

Data Analysis and Coding Criterion

Computers were used to manage the data by analyzing for statistical values as follows: 1) averages, standard deviations, and distribution coefficients were used to test the first research hypothesis, and 2) Confirmatory Factor Analysis was used to test the second research hypothesis with the following statistical values:) a(Factor Loading Matrix consisting of factor loading and standard errors: SE and t values; (b) Regression Coefficient: R2; (c) Factor Score Coefficient: FS; (e) error: e; (f) correlation coefficient among variables;)g) Relative Chi-Square: CMIN/DF; (h) Root Mean Square Error of Approximation: RMSEA; (i) Goodness-of-Fit Index: GFI; (j) Adjusted Goodness-of-Fit Index: AGFI; (k) Comparative Fit Index: CFI; and (l) Normed Fit Index: NFI.

The Criterion for Coherence between the Theoretical Model and the Empirical Data Test

The coherence test between the theoretical model and the empirical data applied the criterion, which was suggested by Holmes-Smith (2006 (and Hair, Black, Babin & Anderson (2010): Relative Chi-Square: CMIN/DF between 1 -3 or less, 2) Root Mean Square Error of Approximation: RMSEA lower than 0.05, 3) Goodness-of-Fit Index: GFI between 0.90 – 1.00, 4) Adjusted Goodness- of-Fit Index: AGFI between 0.90 – 1.00, 5) Comparative Fit Index: CFI between 0.90 – 1.00, and 6) Normed Fit Index: NFI between 0.90 – 1.00.

The Result of the Theoretical Model Creation

As a result of the study of University of Western Sydney (2007); Elias (2011); Morrison (2013); Brooke (2013); Keenan (2013); Richardson (2014); Meador (2015); Kitendo (2016); Driscoll (2016); Wagner (2016); Money-Zine Website (2016); Concordia University (2017); New Zealand Ministry of Education (2017); and Sutcliffe (2 0 1 7) , the four key elements of Educational Leadership: LED were:) 1 (“Having Vision”: VIS,)2 (“Communication Skills”: CMC,)3 (“Inspiration”: MVT, and)4 (“Commitment”: COM. Each element consisted of sub-elements, which were relative as a measurement model as shown in Table 1:

Table 1: The Key Elements of Educational Leadership: LED, the Sub-Elements of Each Key Element, and the Abbreviations

The Key Elements of Educational Leadership: LED and the Sub-Elements of Each Key Element	Abbreviations
1. Key Element: Having Vision	VIS
1.1 Sub-Element1 : Being optimistic	VIS1
1.2 Sub-Element2 : Communicating Effectively	VIS2
1.3 Sub-Element3 : Taking Risks	VIS3
1.4 Sub-Element 4: Leading towards Excellence	VIS4
2. Key Element: Communication Skills	CMC
2.1 Sub-Element1 : Being a Good Listener	CMC1
2.2 Sub-Element2 : Communicating clearly	CMC2
2.3 Sub-Element3 : Motivating Others	CMC3
3. Key Element: Inspiration	MVT
3.1 Sub-Element 1: Being a Visionary	MVT1
3.2 Sub-Element 2: Being Reliable	MVT2
3.3 Sub-Element 3: Empowering Others	MVT3
4. Key Element: Commitment	COM
4. 1Sub-Element1 : Focusing on the Goal	COM1
4. 2Sub-Element2 : Being Loyal	COM2
4. 3Sub-Element3 : Having a Positive Attitude	COM3

The key elements of Educational Leadership and the sub-elements of each key element mentioned previously are shown as The Structural Relationship Model of Indicators of Educational Leadership for Primary School Principals. These are considered to be the theoretical model used in the research as shown in Figure1 :

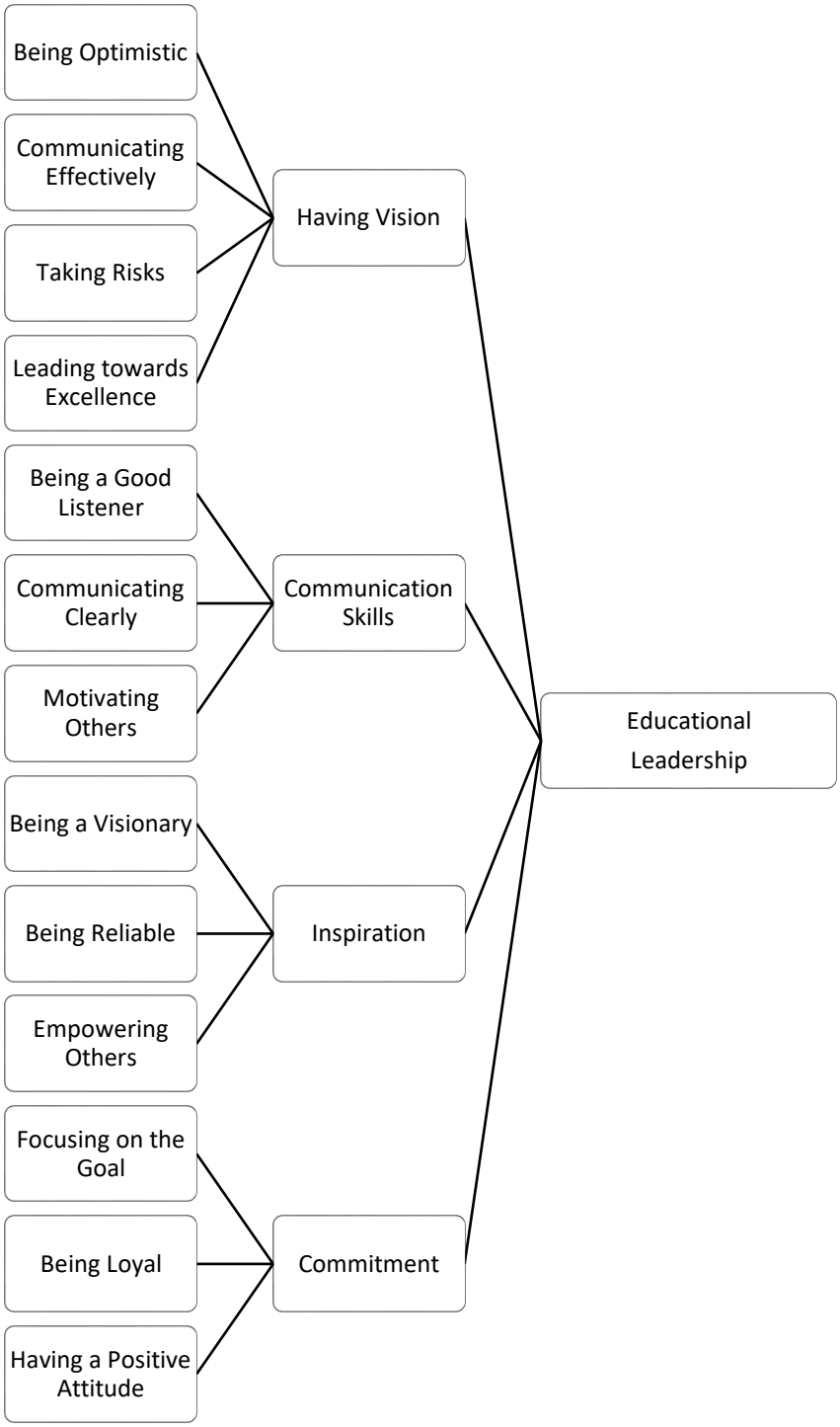

Figure 1: The Structural Relationship Model of the Indicators of Educational Leadership for Primary School Principals: The Theoretical Model Used in the Research

Moreover, the sub-elements of each key element consisted of the indicators, which are shown in Table 2:

Table 2 : The indicators of the Sub-Elements for Each Key Element

Key Element and Sub-Elements	Indicators
Having Vision	
Being Optimistic	1) having positive ways of thinking when encountering problems 2) believing in one's own abilities 3) possessing a positive attitude 4) being hopeful
Communicating Effectively	1) participating in the process of transmitting or communicating between individuals 2) using one's own abilities to communicate with others 3) expressing one's needs, desires, and feelings 4) aiming to invite the message receiver to respond 5) understanding the meaning as intended
Taking Risks	1) being brave when having to make decisions 2) being creative 3) being brave when encountering problems 4) having self-confidence 5) being brave and trying new things
Leading towards Excellence	1) aiming for the best quality when carrying out tasks 2) constantly having higher goals 3) building a sustainable future 4) always improving the organization's potential 5) continuing to perform in an outstanding manner
Communication Skills	
Being a Good Listener	1) listening with a purpose 2) listening with manners 3) knowing how to examine the content of a message 4) understanding the main ideas and the sub-ideas
Communicating Clearly	1) delivering messages that are easy to understand 2) delivering clear messages 3) creating co-perceptions 4) establishing a suitable communicative context
Motivating Others	1) being an internal driving force 2) demonstrating behaviors without persuasion 3) achieving goals
Inspiration	
Being a Visionary	1) having a vision for the future 2) having future goals 3) having plans for the future 4) understanding the direction of the missions 5) having a thoughtful approach and reflecting 6) being determined until success is reached
Being Reliable	1) being reliable at work 2) being responsible for work 3) completing the hard work 4) behaving appropriately in all situations 5) exhibiting good personal behaviors
Empowering others	1) engaging in the process of increasing the potential of individuals 2) supporting/encouraging 3) allowing others to freely make decisions 4) managing an appropriate work environment 5) encouraging the improvement of the work potential of an individual 6) solving both one's own problems, as well as the organization's problems
Commitment	
Focusing on the Goal	1) having future desires 2) having plans to achieve goals at work 3) being able to achieve through management processes

Being Loyal	1) respecting the organization 2) being willing to work 3) dedicating one's self to the organization 4) supporting and protecting the organization 5) having the intention to work
Having a Positive Attitude	1) finding different positive perspectives from the normal ones 2) being useful in life 3) being useful in the lives of others 4) eliminating negative attitudes 5) having good feelings that lead to success

Results of Data Analysis

1. **Research Objective 1:** To study the suitability of 60 indicators to be selected and put in the model by considering the average measurement of 3.00 or more, as well as by considering the distribution coefficient of 20% or lower. The results of the analysis were as follows:
   1.1) The measurement model in the aspect of "Having Vision" was comprised of four elements: "Being Optimistic," "Communicating Effectively," "Taking Risks," and "Leading towards Excellence." There were 19 indicators with average figures between 4.24 -4.59 and with distribution coefficient figures between 11.54-15.80.
   1.2) The measurement model in the aspect of Communication Skills was comprised of three elements: "Being a Good Listener," "Communicating Clearly," and "Motivating Others." There were eleven indicators with average figures between 4.07-4.41 and with distribution coefficient figures between 13.60-17.80.
   1.3) The measurement model in the aspect of Inspiration was comprised of three elements: "Being a Visionary," "Being Reliable," and "Empowering Others." There were seventeen indicators with average figures between 4.02-4.39 and with distribution coefficient figures between 12.70-18.40.
   1.4) The measurement model in the aspect of Commitment was comprised of three elements: "Focusing on the Goal," "Being Loyal." and "Having a Positive Attitude." There were thirteen indicators with average figures between 4.39-4.57 and with distribution coefficient figures between 10.98-13.43.

From the results, the average values of all 60 indicators were between 4.02 - 4.59 and between 10.98 – 18.40 for the distribution coefficient. This meant that the indicators, which had been used in this research, could be selected and put in the model because the average and distribution coefficient values were as set in the measurement.

2. **Research Objective 2:** To test the theoretical model's fit with the empirical data in accordance with the criterion. The results of the analyses were as follows:
   2.1) Pearson's Correlation Coefficient was utilized to consider the levels and directions of the correlation. It was found that the indicators in all measurement models had a positive relation with a statistical significance of 0.01 ($p< 0.01$). In addition, the measurement model in the aspects were as follows: 1) "Having Vision" showed correlation coefficient figures between 0.228 – 0.802; 2) "Communication Skills" showed 0.389 – 0.729; 3) "Inspiration" showed 0.316 – 0.758; and 4) "Commitment" showed 0.374 – 0.664.
   2.2) The statistical figures of Bartlett considered the correlation of the elements. It was found that among the variables, the Matrix of Correlation Coefficient had differed from the identity variables with a statistical significance of 0.01. Moreover, the Bartlett test of Sphericity was 4643.850, 7102.625, 11534.670, and 11385.315, respectively, which had a value of 0.01 ($p< 0.01$) of possibility.
   2.3) The Kaiser-Mayer-Olkin Measurers of Sampling Adequacy (KMO) were used to measure the sufficiency of the sample group. It was found that the KMO of the measurement model in the aspects of "Having Vision," "Communication Skills," and "Commitment" had ranged between 0.922 - 0.963, which meant that the size of the sample group used in the research had been sufficient for the Confirmatory Factor Analysis.

2.4) First Order Confirmatory Factor Analysis of the four measurement models, which were "Having Vision," "communication Skills." "Inspiration," and "Commitment", was utilized to find the statistical numbers to investigate the fitness of the models with the empirical data from the set criteria as follows: 1) the Relative Chi-Square: CMIN/DF was between 1 -3 or less, 2) the Root Mean Square Error of Approximation: RMSEA was lower than 0.05, 3) the Goodness-of-Fit Index: GFI was between 0.90 – 1.00, 4) the Adjusted Goodness-of-Fit Index: AGFI was between 0.90 – 1.00, 5) the Comparative Fit Index: CFI was between 0.90 – 1.00, and 6) the Normed Fit Index: NFI was between 0.90 – 1.00 as shown in Table2 :

Table 2: The Results of the First Order Confirmatory Factor Analysis of the four Measurement Models

Measurement Models	CMIN	RMSA	GFI	AGFI	CFI	NFI
Having Vision	2.400	0.049	0.963	0.926	0.979	0.965
Communication Skills	1.148	0.016	0.995	0.977	1.000	0.996
Inspiration	2.359	0.048	0.967	0.929	0.989	0.979
Commitment	1.471	0.029	0.989	0.964	0.997	0.992

Table 2shows all four models. These were developed from the theories, which were coherent to the empirical data and were important elements ("Having Vision," "Communication Skills," "Inspiration," and "Commitment") of the structural correlation model of the indicators of Educational Leadership for Primary School Principals. The results of the analysis were used to create 13 equations of elements scales as follows:

VIS1 = (VI1+VI2+VI3+VI4) = (0.12+ 0.11+ 0.17+0.17) = 0.4
VIS2 = (VI5+ (VI6 + VI7+VI8+VI9) = (0.13+ 0.01 +0.09+0.12+0.06) = 0.29
VIS3 = (VI10+ VI11 + VI12+VI13+VI14) = (0.08+0.06+0.08+0.04+0.04) = 0.3
VIS4 = (VI15+ VI16 + VI17+VI18+VI19) = (0.20+0.12+0.13+0.10+0.10) = 0.65
CMC1 = (CM20+CM21+CM22+CM23) = (0.09+ 0.13+ 0.17+0.22) = 0.61
CMC2 = (CM24+ CM25 + CM26+CM27) = (0.16+ 0.21 +0.12+0.14) = 0.63
CMC3 = (CM28+ CM29 + CM30) = (0.22+0.39+0.15) = 0.76
MVT1 = (VT31+VT32+VT33+VT34+VT35+VT36) = (0.12+ 0.09+ 0.07+0.21+0.07+ 0.06) = 0.55
MVT2 = (VT37+ VT38 + VT39+VT40+VT41) = (0.27+ 0.02 +0.09+0.17+0.31) = 0.86
MVT3 = (VT42+ VT43 + VT44+VT45+VT46+VT47) = (0.09+0.23+0.11+0.01+ 0.02+0.12) = 0.58
COM1 = (CO48+CO49+CO50) = (0.15+ 0.17+ 0.18) = 0.5
COM2 = (CO51+ CO52 + CO53+CO54+CO55) = (0.19+ 0.05 +0.16+0.05+0.18) = 0.63
COM3 = (CO56+ CO57 + CO58+CO59+CO60) = (0.10+0.12+0.20+0.11+0.09) = 0.62

2.5 Second Order Confirmatory Factor Analysis was utilized to find statistical numbers as a model investigation criterion from the created sub-element scale. The four measurement models were the "Having Vision" measurement model with four sub-elements, the "Communication Skills" measurement model with three sub-elements, the "Inspiration" measurement model with three sub-elements, and the "Commitment" measurement model with three sub-elements. The results of the data analysis were as follows:

The results of the fitness investigation of the sub-elements of each model were that every sub-element had shown suitable statistical numbers for the second order confirmatory factor analysis:) 1 (Pearson's Correlation Coefficient – the 13 sub-elements had shown a positive correlation that was statistically significant at 0.01 (p< 0.01) with the correlation coefficient between 0.918 -0.963;) 2 (the Correlation matrix between variables was different from the identity matrix with a statistical significance of 0.01 with 6690.213 of Bartlett Test of Sphericity, which had a 0.01 (p< 0.01) possibility; and) 3 (Kaiser-Mayer-Olkin Measurers of Sampling Adequacy: KMO was 0.932.

The results of the data analysis to test the fitness of the models were that the models fit with the Empirical data given that the relative Chi-square: CMIN/DF) =2 .408, the Root Mean Square Error of Approximation: RMSEA =0 .049, the Goodness-of-Fit Index: GFI) =0 .986, the Adjusted Goodness-of-fit index: AGFI =0 .944, the

Comparative Fit Index: CFI =0 .995, and the Normed Fit Index: NFI =0 .992. These were all as set in the criteria. Additionally, from the investigation, it was found that the factor loading of the four key elements had been positive (between 0.60– 1.29) and had shown a statistical significance of 0 .01. When used to create element scale, the equation was LED = 1.46 (MVT) + 1.44 (VIS) + 1.00 (COM) + 0.89 (CMC).

3. Research Objective 3: To investigate the factor loading of the key elements, sub-elements, and the indicators in accordance with the following criteria: 1) the factor loading of the key elements = 0.7 or higher and 2) the factor loading of the sub-elements and the indicators = 0.30 or higher. The results of the data analysis were as follows:

3.1 All four key elements of Educational Leadership had shown positive factor loadings of between 0.60 – 1.29 and had also had a statistical significance of 0.01. The factor loading from highest to lowest had been "Inspiration," "Commitment," "Having Vision," and "Communication Skills" at 1.46, 1.00, 0.89, and 0.89, respectively.

3.2 All sub-elements of the Key Element of 'Having Vision' had shown positive factor loadings of between 0.60 – 1.00 with a statistical significance of 0.01. The factor loadings from highest to lowest had been "Leading towards Excellence." "Communicating Effectively," "Taking Risks," and "Being Optimistic" at 1.00, 0.79, 0.78, and0 .60, respectively.

3.3 The three sub-elements of the Key Element of 'Communication Skills' had had positive factor loadings of between 1.00 – 1.29 with a statistical significance of 0.01. The factor loadings from highest to lowest had been "Being a Good Listener," "Communicating Clearly," and "Motivating Others" at 1.29, 1.26, and 1.00, respectively.

3.4 The three sub-elements of the Key Element of 'Inspiration' had positive factor loadings of between 0.98 – 1.08 with a statistical significance of 0.01. The factor loadings from highest to lowest had been "Being a Visionary," "Empowering Others," and "Being Reliable" at1 .08, 1.00, and 0.98, respectively.

3.5 The three sub-elements of the Key Element of 'Commitment' had positive factor loadings of between 0.61- 1.00 with a statistical significance of 0.01. The factor loadings from highest to lowest had been "Having a Positive Attitude," "Being Loyal," and "Focusing on Goals" at 1.00, 1.00, and 0.61, respectively.

Furthermore, the factor loading of 60 indicators was positive between 0.68 – 1.34 with a statistical significance at 0.01. The indicator with highest factor loading had been "Building a Sustainable Future" (1.34), whereas the indicator with the lowest factor loading had been "Listening with a Purpose" (0.68).

To summarize, the factor loading of the key elements, sub-elements, and the indicators had been positive and had been in accordance with the criteria of a statistical significance at 0 .01. This indicated that the theoretical correlative models of the Educational Leadership indicators for Primary School Principals, which were used in this research, had been comprised of four key elements, 13 sub-elements, and 60 indicators and could be used as measurement for Educational Leadership for Primary School Principals with construct validity. From the previously mentioned data analysis, the adjusted model is shown in Figure2 :

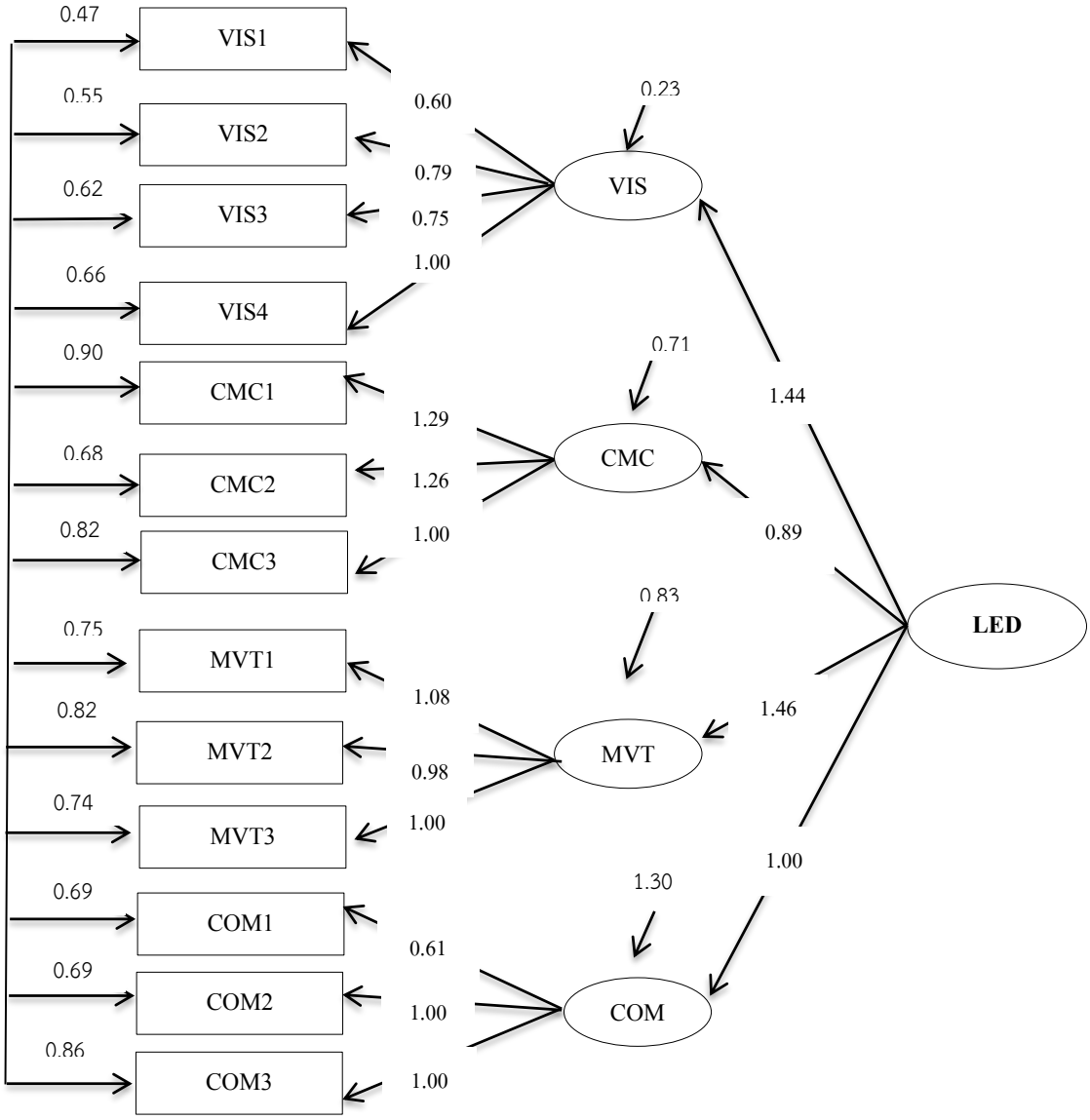

Figure 2 : The Adjusted Structural Correlative Model of the Educational Leadership Indicators for Primary School Principals

Discussion and Suggestions

From the results of the data analysis, it was shown that the structural models had created the indicators of Educational Leadership for Primary School Principals, which were comprised of 4 key elements, 13 sub-elements, and 60 indicators. These had been developed from theories, which were determined to be coherent with the empirical data as stated in the research hypothesis. However, given that there is the dissemination of the theories arising from globalization, the original sources of the theories could have originated from the theoretical definitions, which were used to create the models and which were coherent with the expressive behaviors of the sample research group. Giddens (1990) stated that globalization is a social correlative process with no obstacle of distance or borders. Moreover, it could be due to the concept of dissemination of innovations by Rogers (1995), who stated that the changes in a society are caused by the application of an innovation from another society. Another reason could stem from the fact that the rapid changes of digital technology in 21st century may have resulted in a global knowledge and information society, which has caused the dissemination of knowledge or information from one corner of the world to another very quickly and widely (Ceulemans, 2012; Rawat, 2020; Adhiarso, Prahastiwi & Hastjarjo, 2019).

The reasons, which have been discussed, are in alignment with the reasons used in the discussion of the research results, which tested the models of the indicators of leadership in Thailand, as well as the results of other research studies, such as Indicators of Resourceful Leadership for Secondary School Principals: Developing and Testing The Structural Relationship Model)Marwiang, Sanrattana & Suwannoi, 2018), Indicators of Innovative Leadership for Secondary School Principals: Developing and Testing the Structural Relationship Model (Somsueb, Sutheejariyawatana & Suwannoi, 2019), The Structural Relationship Model of Indicators of Mindful Leadership for Primary School Principals in Thailand (Wongkom, Sanrattana & Chusorn, 2019), and The Indicators of Authentic Leadership for Teachers in the General Education Session of Buddhist Scripture Schools)Moonsarn, Sanrattana & Suwannoi, 2019).

From the research results of both the test of fitness of the theoretical models and the empirical data & the factor loading of the elements, it was found that the structural model of the indicators of Educational Leadership for Primary School Principals, which was comprised of 4 key elements, 13 sub-elements, and 60 indicators, can be used with reliability in construct validity and is, therefore, suitable for Thai society. The suggestions are as follows:

1) The application of the models from this research should be encouraged and used as guidelines in the development of Educational Leadership for the population of this research, which were Primary School Principals under the Office of the Basic Educational Commission in Thailand. In addition, what should be kept in mind is the importance of the key elements, sub-elements, and the indicators from the highest factor loading to the lowest:

- Ranked from the highest to the lowest, the four key elements of the Educational Leadership had been: 'Inspiration,' 'Commitment,' 'Having Vision,' and 'Communication Skills.'
- The sub-elements of the key element of 'Having Vision' ranked from the highest to the lowest had been "Leading towards Excellence," "Communicating Effectively," "Taking Risks," and "Being Optimistic."
- The sub-elements of the key element of 'Communication Skills' ranked from the highest to the lowest had been "Being a Good Listener," "Communicating Clearly," and "Motivating Others."
- Ranked from the highest to the lowest, the three sub-elements of the key element of 'Inspiration' had been "Being a Visionary," "Empowering Others," and Being Reliable."
- The three sub-elements of the key element of 'Commitment' ranked from the highest to the lowest had been "Having a Positive Attitude," "Being Loyal," and "Focusing on the Goal."
- From an examination of the 60 indicators, the one with the highest factor loading was found to be "Building a Sustainable Future," while the lowest one was "Listening with a Purpose."

2) Regarding the cases that are worth studying for future academic benefits, the suggestions are as follows:

a .Using qualitative research methodology, a study of the key elements, sub-elements, and the indicators should be conducted in the context of Thai society. Grounded theory should be utilized in order to create a model from the qualitative research results, and these should be compared with the ones from the results of this quantitative research.

b .This research has studied the definitions of the academics or departments and has found that there are more key elements of Educational Leadership. However, because there was a limitation to the determination of the elements, high frequency was used as a criterion of the selection, which resulted in those theoretical elements not being used in this research. Therefore, in the future, other logic should be applied when making selections instead of using the high frequency approach. In this way, the elements with lower frequency could be used in the research, which may be important and may lead to new discoveries. The following are examples of those elements: Being Reliable; Having Integrity; Being Aware; Learning all the time; Being Innovative; Building relationships with the community; Improving the learning outcomes for all students; Having Management Skills, Emotional Intelligence, and The Power of Positive; Understanding Human Nature; Developing and maintaining schools as learning organizations; Developing individuals in and out of the classroom; Having Courage; Showing Respect; Having the Ability to Move & Change Initiatives; Supporting the Team;

Leading by Example; Taking Responsibility; Being Self-Confident; Being Flexible; Having Curiosity; Being enthusiastic; Creating with technology; Creating course strategies; Work is learning; Surrounding yourself with Good People; Having ambitions; Having Organizational Knowledge; Using Instructional Leadership; and Participating in Leadership Development, etc.

References

Adhiarso, D.S., Utari,P., & Hastjarjo, S. (2019). *The Impact of digital technology to change people's behavior in using the media*. shorturl.at/amr49

Behbahani, A. (2011). Educational leaders and role of education on the efficiency of school principals. *Procedia - Social and Behavioral Sciences*. 15 (2011), 9-11.

Brooke, E. (2013). *Four key factors of effective school leadership*. https://bit.ly/2DJpu19

Cerny, C.A., & Kaiser, H.F. (1977). A Study of a measure of sampling adequacy for factor-analytic correlation matrices**.** *Multivariate Behavioral Research, 12*(1), 43-47.

Ceulemans, W.P. (2012). *The Impact of technology on social behavior*. Master Thesis in School Counseling, Graduate School, University of Wisconsin-Stout.

Concordia University (2017). *Five traits of a good educational leader*. https://bit.ly/2RJYmC0

Dowd, M. (2018). *Duties and responsibilities of school principals*. shorturl.at/BCQZ7

Driscoll, M. (2016) . *Top 10 characteristics of successful 21st-century school leaders*. https://bit.ly/2zyN2Ba

Driscoll, M. (2020). *The Value of a 21st century education*. shorturl.at/nsTW4

Elias, M.J. (2011). *The 7 Characteristics of a good education leader.* https://edut.to/2g3MiJj

Giddens, A (1990). *The Consequences of modernity. Cambridge: Polity.*

Gold, R. (1980). *Clinical supervision.* 2nd edition. New York: Holt Rinehart and Winston.

Hair, J.F., Black, W.C., Babin, B.J., and Anderson, R.E. (2010). *Multivariate data analysis*. 7th Edition. Upper Saddle River, NJ: Prentice Hall.

Holmes-Smith, P. (2006). *School socio-economic density and its effect on school performance*. MCEETYA.

Keenan (2013). *Five essential traits of 21st century school leaders*. https://bit.ly/2OK0pUD

Kitendo, P.M. (2016). *Effective educational leadership*. https://bit.ly/2QMhsHB

Lathan, J. (2021). 10 *Traits of successful school leaders*. shorturl.at/inKV0

Marwiang, K., Sanrattana, W., & Suwannoi, P. (2018). Indicators of resourceful leadership for secondary school principals: Developing and testing the structural relationship model. *International Education Studies*. 11(11), 62-68.

Meador, D. (2015). *How effective educational leadership shapes school success*. https://bit.ly/2zdjutj

Money-Zine Website (2016*). Educational leadership*. https://bit.ly/2ThcLqP

Moonsarn, C., Sanrattana, W., & Suwannoi, P. 2019). Indicators of authentic leadership for teachers in the general education session of Buddhist scripture schools. *International Journal of Education Studies.* 12(12), 62-70.

Morrison, N. (2013). *The Eight characteristics of effective school leaders*. https://bit.ly/2FoLKPf

New Zealand Ministry of Education (2017). *A Model of educational leadership*. https://bit.ly/2FqTCje

Rawat, S. (2020). *How technology affects human behavior*. shorturl.at/fuKW2

Richardson, W. (2014). *The Eight new attributes of modern educational leaders*. https://bit.ly/2Bk4XdO

Rogers, E. M. (1995). *Diffusion of Innovations,* https://bit.ly/2t3HoXJ

Sanrattana, W. (2018). *Research in educational administration: Concepts, guidelines, and case studies.* 4th Edition, Bangkok: Tipwisut.

Sanrattana, W. 2018). *New paradigm in education: A Case of viewpoint on 21st century education.* Bangkok: Tipwisut.

Somsueb, A., Sutheejariyawatana, & Suwannoi, P. (2019). Indicators of innovative leadership for secondary school principals: Developing and testing the structural relationship model. *Journal of International Education Studies*. 12(1), 11-18.

Sutcliffe, J. (2017). *The Eight qualities of successful school leaders*. https://bit.ly/2jnUhn5

University of Western Sydney (2007). *Quality leadership in Australian schools*. https://bit.ly/2zY4wHp

Wagner, J. (2016). *Five key characteristics of a strong higher education leader*. https://bit.ly/2Dsk5v0

Wiratchai, N. (2002). *Development of indicators for assessment of administration and management of Educational Service Areas*. Bangkok: Thanaksorn.

Wongkom, S., Sanrattana, W. & Chusorn, P. (2019). The Structural relationship model of indicators of mindful leadership for primary school principals in Thailand. *International Journal of Higher Education.* 8(5), 134-142.

Appendix

The Questionnaire used in the research

Instruction Check ✓ in the column that match with your behaviors by considering the scales:5 = The Most, 4 = Much, 3 = Medium, 2 = A Little, 1 = The Least

No.	Behaviors	Level of Expressiveness (Highest ← → Lowest)				
		5	4	3	2	1
Key Element1 : Having Vision						
Sub-Element1 : Being Optimistic						
1	You perceive the coming problems positively.					
2	You believe that you can do it.					
3	You always have a positive attitude.					
4	You have hope for the future.					
Sub-Element2 : Communicating Effectively						
5	You have ways to communicate or send messages among individuals.					
6	You are able to use your abilities to communicate your messages and to make people understand.					
7	You communicate to express your needs, desires, and feelings.					
8	You persuasively communicate with the receivers and receive responses.					
9	You are able to communicate with others and they understand the messages as you intended to send them.					
Sub-Element3 : Taking Risks						
10	You have courage to make a decision to do something.					
11	You are creative, determined to develop, and seek knowledge.					
12	You are brave when facing problems.					
13	You believe in yourself.					
14	You are brave to try new things which can lead to success.					
Sub-Element 4: Leading towards Excellence						
15	You do everything giving your best for the best quality.					
16	You improve your goals all the time.					
17	You build a sustainable future.					
18	You always improve the organization's potential.					
19	You keep doing outstanding work.					
Key Element2 : Communication Skills						
Sub-Element1 : Being a Good Listener						
20	You listen with a purpose.					
21	You are a good listener.					
22	You think about what you are listening to.					
23	You know the main and sub-ideas.					
Sub-Element2 : Communicating Clearly						
24	You communicate messages that are easy to understand.					
25	You communicate clear messages.					
26	You communicate for co-perception.					
27	You communicate in an appropriate context.					
Sub-Element: Motivating others						
28	You motivate with internal driving force.					

No.	Behaviors	Level of Expressiveness (Highest → Lowest)				
		5	4	3	2	1
29	You motivate individuals to express their unique identity without persuasion.					
30	You motivate to foster achievements.					
Key Element3 : Inspiration						
Sub-Element1 : Being a Visionary						
31	You work with a vision of the future.					
32	You work with future goals.					
33	You plan for the future.					
34	You have directions for your tasks.					
35	You reflect in pro-active ideas.					
36	You are determined to succeed.					
Sub-Element 2: Being Reliable						
37	You are expected to be able to complete your tasks.					
38	You have a working process that is reliable, and success is guaranteed.					
39	You work hard and succeed; people trust you.					
40	You behave appropriately in situations.					
41	You have good personal behaviors and are fair and unbiased.					
Sub-Element3 : Empowering others						
42	You have ways to increase an individual's potential.					
43	You support your team.					
44	You give freedom to your team when making decisions.					
45	You manage an environment that is appropriate for work.					
46	You encourage the work abilities of individuals.					
47	You support individuals to solve problems on their own, which leads to the organization's success.					
Key Element 4: Commitment						
Sub-Element 1: Focusing on the Goal						
48	You determine what you want in the future.					
49	You plan for work achievements.					
50	You have a management process for work achievements.					
Sub-Element 2: Being Loyal						
51	You have good feelings toward your organization.					
52	You are willing to work.					
53	You dedicate yourself to your organization.					
54	You have bonds, love, and support; you protect your organization.					
55	You intend to achieve the organization's goals.					
Sub-Element 3: Having a Positive Attitude						
56	You look for different positive aspects from the usual aspects.					
57	You have positive ways of looking at things in order to do useful things in your life.					
58	You have positive ways of looking at things in order to do useful things in the lives of others.					
59	You have ways to eliminate negative attitudes.					
60	You eliminate negative attitudes for better feelings, which can lead to making achievements.					

The Asian Institute of Research
Education Quarterly Reviews
Vol.4, No.1, 2021: 235-252
ISSN 2621-5799

DOI: 10.31014/aior.1993.04.01.190

Investigation of Performance Indicators in the Strategic Plans of Public Universities in Turkey

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Abstract
The purpose of this study is to develop performance indicators in line with these goals and objectives in the light of domestic and foreign literature by examining the strategic goals and objectives in the strategic plans of public universities in Turkey. Within the scope of the research, firstly strategic plans of many universities operating at home and abroad were examined and a performance indicator pool consisting of 300 criteria was created in the light of the strategic plans of 11 different universities selected by purposeful sampling. Also Reports of the Council of Higher Education (YÖK) and Ministry of Development on strategic planning were examined. In the second stage, expert opinion was received from 2 faculty members working in the field of education management, and the 300 item list was reduced to 45 performance indicators under 6 main strategic dimensions. In the third and final stage of the research, performance indicators were classified according to their importance by using AHP (Analytical Hierarchy Process) method, which is a multi-criteria decision-making technique. The AHP study was carried out with 10 academics who had scientific studies in the field of strategic planning and worked in university administration. Finally, the performance indicators created for each strategic dimension are listed according to their criterion weights.

Keywords: Higher Education, Performance Indicators, Strategic Planning

1. Introduction

The strategic planning in an institution includes the participation of staff at all levels and the full support of the institution manager. In this process; expectations of stakeholders and policy makers play an active role to determine the mission, objectives and performance measurement of the organization. Strategic planning helps in answering 4 basic questions for an organization (Ministry of Development, 2018a).

- Where are we?
- Where do we want to go?

- How can we reach where we want to go?
- How do we measure and evaluate our success?

The answers given to these questions constitute the strategic planning process. According to the Council of Higher Education (YÖK), the purpose of the strategic planning process is to determine the mission, vision and basic values of higher education institutions and the faculties, schools, conservatories, vocational schools, institutes, research centers, administrative units (library, computing etc.) and other units to establish their goals in line with the strategies of the relevant institutions (YÖK, 2007). At the same time, creating a system to determine and monitor performance criteria for the improvement of the quality of higher education institutions is a part of this process.

The performance program refers to the description of the priority strategic goals and objectives for the implementation of a financial system in strategic planning created by institutions and organizations including appropriate performance targets, activities, sources, and performance evaluations. Public administrations, budgets and resource allocation on a program and project basis in order to provide some standards of public services; based on their strategic plans, annual goals and objectives and performance indicators (Yüksel, 2014).
Performance indicators are the tools to measure the success of the strategic plan and especially the results of implementation. Performance indicators are used to measure and evaluate the results achieved in the fulfillment of the strategic goals and objectives of organizations and form the basis for performance measurements. These indicators are classified as input, output, result, effectiveness and quality indicators (Altun, 2019).

2. Literature Review

Types of performance indicators can be briefly explained as follows (Hastürk, 2009):
Input indicators: The human financial and physical resources needed to produce a product or service. The input indicators reflect the initial state, which is the basis for measuring.
Output indicators: The amount of products and services produced. Although output indicators provide information about the quantity of goods and services produced, they are not alone explanatory about whether goals and objectives are achieved or the quality of the goods or services produced and the effectiveness of the production process.
Productivity indicators: Input or cost per unit of output. It shows the relationship between inputs and outputs.
Outcome indicators: They show how and to what extent the outputs achieved are successful in achieving strategic goals and objectives. The level of success in achieving the targeted results is expressed by efficiency. Result indicators are the most important performance indicators in terms of revealing whether strategic goals and objectives have been achieved.
Quality indicators: The level reached in meeting the expectations of those who benefit from goods or services or those concerned (measures such as reliability, accuracy, behavior, sensitivity and integrity).

Creating and evaluating performance indicators is possible only by providing appropriate data and statistics. The existence of accurate and consistent data suitable for the purpose, creation of performance indicators, measurement and evaluation of performance is an indispensable prerequisite (Mutluer, Öner & Kesik, 2005).

The characteristics that performance indicators should have are stated below as items (Yüksel, 2014):
Meaningful and connected: Providing direct and meaningful information directly related to the mission, goals and objectives.
Institutionally accepted: Utilization of policy and budget decisions in the institution.
Balanced: It includes different indicator types in order to provide a clear picture about performance.
Clear, well defined and simple: Easy to understand, easy to calculate, easy to interpret, not to misunderstand.
Reliable, consistent, updated and timely: The data it relies on are accurate and credible; balance with the correctness of data and the production of data on time.
Comparable: To be suitable for internal and external comparisons and for years based comparisons.
Verifiable: Processes regarding data collection / production are not doubtful and clearly documented.

No adverse effects: Not promoting negative, unwanted or useless trends.

However, Kueng (2000) defined the basic features of performance indicators as follows:

1. Performance indicators should be in a measurable format indicating number, ratio or quantitative result.
2. Performance indicators should be sensitive to change.
3. A performance indicators should be linear. Linearity means that performance changes through a linear relationship with the value of the indicator.
4. A performance indicator should be reliable. Reliability means that performance must be calculated correctly, both in routine conditions and in unexpected situations.
5. Performance indicators should be efficient, clear and understandable.
6. Performance indicators should be directed towards improvement within the strategic plan. The progressive performance indicator expresses the necessary changes to ensure competitive business performance.

According to Parmenter (2010), performance indicators represent criteria for measuring and evaluating corporate performance, which is critical to the organization's current and future success. Performance indicators should be monitored regularly and revised if they do not meet the goals (Arif & Smiley, 2004). For educational institutions, determining performance indicators should include all stakeholders of the organization and have a direct impact on the basic budget (Conlon, 2004). According to Burke and Minassians (2002) the use of performance indicators is important because it is a real test of accountability for how well universities meet the needs of students, governments and society.

According to Arif and Smiley (2004), the key points of key performance indicators should be as follows:

Table 1: Performance Indicators and Focal Points

Subject	**Focal Points**
Strategic planning and growth	Student registration, ranking by independent institutions, number of patents, graduation rate, research fees, publications published by the faculty, and stakeholder satisfaction etc.
Financial functioning	Received income, expenses, research grant amount, budget deficit / surplus, donations, federal financial aid obtained, etc.
Career planning	Percentage of internship students, the number of companies that come to the campus for recruitment, the percentage of students receiving full time employment for graduation, the average salaries of each major, the number of faculty industry interactions, etc.
Information services	Percentage of students with computer access, percentage of university covered by wireless internet access, number of hits on different websites, return time for hardware and application complaints, dollars saved from development of applications, etc.
Joint collaborations with institutions	The number of patents, number of companies consulted, number of students working in companies, income generated for the university, number of faculty members participating, number of publications published, faculty-industry partnerships, etc.

Different universities can use different criteria in terms of performance indicators. Ohio State University has also developed key performance indicators in areas such as academic excellence, outreach programs, participation in social activities, financial resource management, student diversity, and student learning (Ohio State University, 2019). Rhodes University monitors its performance indicators under four main headings (Rhodes University, 2019):

1. **Business income rate:** Resources per student, faculty resources, and financial issues including debt burden rate and service expenses, etc.

2. **General education experience:** Evaluation of basic education experience by students, employment rates of graduates, etc.
3. **Graduate student placement rates:** Undergraduate graduation rates, student enrollment rates for graduate programs, etc.
4. **Human and organizational development perspective:** The number of activities carried out for the development of students, the rates of students actively participating in these activities.

Burke and Minassians (2002) suggested using 14 general core indicators to reflect the priority priorities of state policymakers. According to the study, the most critical suggestion is to enable institutions to report on internal performance. While most of these reports are not included in a government report, internal institutional reports will bring "accountability of performance reporting to units that have the most roles in producing results in most of the indicators." This will increase both internal and external accountability of performance criteria.

In a study conducted by Terkla (2011) based on the strategic plans of 66 universities, performance indicators are grouped into 11 different categories. These categories are as follows:

a. Financial income and expenses table
b. Application rates
c. Registration student rates
d. Faculty teaching staff / student ratios
e. Students (Graduation rates, success rates etc.)
f. Student communities
g. Access to academic information
h. Physical infrastructure
I. Satisfaction rates
I. Research opportunities
j. External evaluations

Terkla (2011) stated that performance indicators vary according to the strategic goals of universities. Pfeffer and Sutton (2006) emphasized the importance of reliable data to be collected in the process of determining performance indicators. In order to increase the validity and reliability of the universities, universities improve the evidence-based management and data of the internal processes; it should combine with external data such as funds, donations and institutional collaborations. In this way, the process can be followed more detailed with periodic and annual development reports. In the strategic planning guide published by the Ministry of Development (2018b) for universities, it was stated that universities should create their own databases for performance indicators without data. It is also necessary to determine how data will be obtained for performance indicators in strategic plans. The data source may be existing operational systems or new sources to be provided through surveys, focus group studies, interviews and observations.

3. Method

The purpose of this study is to develop performance indicators for the strategic goals and objectives in the strategic plans of public universities by examining the domestic and foreign literature.

Within the scope of the research, firstly the strategic plans submitted by the public universities to the Ministry of Development were examined (Ministry of Development, 2019). Özdemir and Tüysüz (2017) studied 36 strategies of 87 public universities and created 36 different strategies under 6 dimensions by using BSC (Balanced Score Card) and Delphi Technique. The dimensions and strategic goals in the corporate performance report are expressed as in Table 2 (Özdemir & Tüysüz, 2017):

Table 1: The Strategies and Dimensions of BSC

DIMENSIONS	STRATEGIES
Financial	F1. To ensure that the financial sources are used and shared in a balanced, effective and efficient way. F2. To increase and diversify the revenues of our university. F3. To determine the investment, policies, and priorities for the physical and technological infrastructure in accordance with the target growth. F4. To develop the budget use and control systems to ensure the financial and administrative discipline.
Stakeholder	SH1. To enhance the stakeholder satisfaction (student-academic-administrative graduate-personnel-board of trustees) SH2. To provide effective consultancy and guidance services for the students SH3. To create a network of healthy and continuous relationships with our stakeholders. SH4. To reward the successes achieved by the most qualified students in our country with financial support to bring them into our university and make this sustainable. SH5. To raise such graduates that will be qualified as globally preferable. SH6. To create such environments that will support the social and academic developments of the students. SH7. To contribute to the solutions of regional and national problems by offering the education and service potential of the university in favor of the stakeholders through the cooperation between the university and stakeholder (industry, supplier, society, etc.).
Learning and Development	LD1. To create and maintain a qualitatively and quantitatively competent academic staff. LD2. To strengthen and maximize any and all infrastructure that will encourage and support the scientific production, and make this sustainable. LD3. To enhance the job satisfaction of the academic and administrative personnel and to support their academic and social development. LD4. To create and maintain the innovation and intrapreneurship culture. LD5. To establish national and international relationships, and to encourage the national and international mobility of the internal stakeholders (students, academicians, and other personnel) LD6. To create the quality culture (in policy and practice: quality assurance mechanisms, processes, data collection, assessment, improvement) LD7. To ensure improvement and sustainability in academic and administrative management.
Internal Processes	IP1. To make the performance assessment efficient, and to support through reward/incentive system. IP2. To create a quality assurance system in academic and administrative processes, to ensure them to be internationally accredited, and make these sustainable. IP3. To enhance the efficiency and effectiveness of the services offered by improving the integrated management information system and data processing infrastructure. IP4. To create a corporate culture that reflects the core values adopted by the university to the fullest extent as well as an efficient and effective management structure. IP5. To create the balance between workload and manpower. IP6. To create qualitatively and quantitatively sufficient physical and social environments that will enhance the motivation of the university personnel, and make these sustainable
	ER1. To encourage publishing and research operations by installing a performance-based academic assessment system ER2. To ensure that technology-aided innovative learning methods to optimize the learning and to support the learning process with technology. ER3. To create and continuously update competitive, flexible programs (graduate,

Education and Research	undergraduate, associate degree, certificate) in accordance with the social expectations and industrial, national and international trends. ER4. To integrate the curriculums with the national and international programs, and to make the academic programs gradually accredited. ER5. To increase the number of original and innovative scientific studies and publications. ER6. To encourage and increase the formal and informal educational activities for entrepreneurship and innovation. ER7. To increase the academic collaborations through national and international universities, research centers, and research networks.
Institutional Image	IM1. To improve the "innovative and entrepreneur" university image. IM2. To ensure the national and international recognition and preferability of the university. IM3. To install the Corporate Communication/Promotion System, and institutionalize the promotional operations. IM4. To establish and maintain strong relationships with the international higher education organizations and associations (being a member to the European University Association (EUA), etc.). IM5. To qualitatively and quantitatively increase the number of events such as symposium, congress, panel, etc. to be held internationally, and ensure the attendance to them.

In this study, it is aimed to create a sample performance indicator list for universities provided that Özdemir and Tüysüz (2017) have developed strategic goals for the universities. Within the scope of the research, the strategic plans of many universities operating at Turkey and abroad were examined. 11 different universities were selected through purposive sampling in the criteria of expressing their performance indicators in their strategic plans. In addition, Strategic Planning Guide for Public Administrations (Ministry of Development, 2018a), Strategic Planning Guide for Universities (Ministry of Development, 2018b), YÖK Private Foundation Universities (YÖK, 2019) and YÖK Academic Evaluation and Quality Improvement Commission Report (YÖDEK, 2007) publications and researches were examined.

The list of universities whose strategic plans are examined is as follows:

1. Northeastern Illinois University - USA (NE, Northeastern Illinois University, 2018)
2. University of Kentucky - USA (KE, University of Kentucky, 2018)
3. University of North Carolina - USA (NC, University of North Carolina, 2018)
4. Marmara University, Turkey (Marmara University, 2018)
5. Yıldız Technical University, Turkey (Yıldız Technical University, 2018)
6. Ankara University, Turkey (Ankara University, 2018)
7. Gazi University, Turkey (Gazi University, 2018)
8. Sakarya University, Turkey (Sakarya University, 2018)
9. 9 Eylül University, Turkey (9 Eylül University, 2018)
10. Atatürk University, Turkey (Atatürk University, 2018)
11. 19 Mayıs University, Turkey (19 Mayıs University, 2018)

In the first stage, the strategic plans of 11 universities, the reports of YÖK and the Ministry of Development were examined and a performance indicator pool consisting of 300 criteria was created. In the second stage, in order to narrow the pool of performance indicators; expert opinion received with 2 faculty members working in the field of educational management, managerial positions in higher education institutions, previously worked in the field of strategic planning and researches on related topics. As a result of the interviews, 300 performance indicators were reduced to 45 performance indicators and grouped under 6 main strategic dimensions.
The performance indicators and strategic dimensions created are given in Table 3.

Table 3: Strategic Dimensions and Performance Indicators

DIMENSIONS	PERFORMANCE INDICATORS	
FINANCIAL	F1.	Occupancy rates by years (private foundation universities)
	F2.	The ratio of income from student enrollments to total income (private foundation universities)
	F3.	The ratio of research and development income to total income
	F4.	The ratio of TÜBİTAK (The Scientific and Technological Research Council of Turkey) project revenues to total income
	F5.	Ratio of international project revenues to total income
	F6.	Ratio of other public and private sector financed project revenues to total revenue
	F7.	The ratio of project revenues carried out in the technopark to total income
	F8.	Ratio of rental income to total income
	F9.	The ratio of donation income to total income
STAKEHOLDERS	S1.	Satisfaction rate and satisfaction survey results of all stakeholders
	S2.	Individual counseling ratio
	S3.	Employment rate of graduates
	S4.	The ratio of the number of disabled-friendly buildings to the total number of buildings
	S5.	Number of course materials offered for students with disabilities
	S6.	Number of training and certificate programs given by distance education for employees and students
	S7.	Number of technoparks, socioparks, application research centers and student rates served in these institutions
	S8.	Number of club activities carried out by student communities
	S9.	Participation rate of students in social responsibility activities
	S10.	Number of cooperation protocols with institutions (Public and private institutions)
LEARNING AND DEVELOPMENT	L1.	Proportion of students participating in the exchange program
	L2.	Number of cooperation protocols with universities operating abroad and abroad
	L3.	The ratio of the number of academic staff sent to universities abroad to the total number of academic staff
	L4.	Number of supports provided by the project writing office
	L5.	Number of students participating in innovation and entrepreneurship activities
INTERNAL PROCESSES	P1.	Accredited department / program ratio
	P2.	Number of students / academic staff ratio
	P3.	Proportion of undergraduate students graduating in normal period
	P4.	Average hours per week per instructor
	P5.	Number of in-service training activities and the proportion of staff participating in these activities
	P6.	Number of social, sportive, cultural activities organized for the personnel
	E1.	Number of courses in entrepreneurship and number of students attending these courses
	E2.	Number of activities organized within the scope of R&D and innovation activities
	E3.	Number of faculty members going abroad for research or education / Total number of faculty members

EDUCATION AND RESEARCH	E4.	Joint higher education program, certificate program etc. carried out with international institutions and organizations. number
	E5.	Number of open project areas (Project Space) where private sector and project ideas can meet 24/7
	E6.	University's place in national and international academic rankings
	E7.	Number of full text publications (SCI-expanded, SSCI and AHCI) published in the evaluation year per faculty member
	E8.	Number of total publications and scientific activities (articles, congresses, conference papers, exhibitions, concerts, performance etc.) per faculty member
	E9.	Number of DPT (State Planning Organization), TÜBİTAK and other publicly funded projects per faculty member
INSTITUTIONAL IMAGE	I1.	Joint higher education program, certificate program etc. carried out with international institutions and organizations. number
	I2.	Number of faculty members going abroad for research or education / Total number of faculty members
	I3.	The number of guest researchers from abroad and the satisfaction rate of these researchers
	I4.	The number of promotional activities carried out at national and international level for university candidates
	I5.	Number of foreign graduate and undergraduate students / Total number of students
	I6.	Number of activities for graduates

In the third and final stage of the research, performance indicators were classified according to their importance by using AHP (Analytical Hierarchy Process) method, which is a multi-criteria decision making technique. The AHP study held administrative duties in the field of strategic planning and was conducted with 10 academics who have scientific studies in this field.

AHP (Analytical Hierarchy Process) is one of the Multiple Criteria Decision Making (MCDM) methods developed by Saaty (1980) for the solution of complex problems. AHP is a measurement theory for binary comparisons based on expert opinions. Comparisons are made using a scale that includes absolute judgments that show how dominant a particular element is to another, according to a particular feature. Unlike other multi-criteria decision-making methods, AHP compares the criteria in pairs and measures whether the comparisons are consistent (Tayyar et al., 2014).

The process of creating a hierarchy with AHP is expressed as in Figure 1 (Karakaya, 2019):

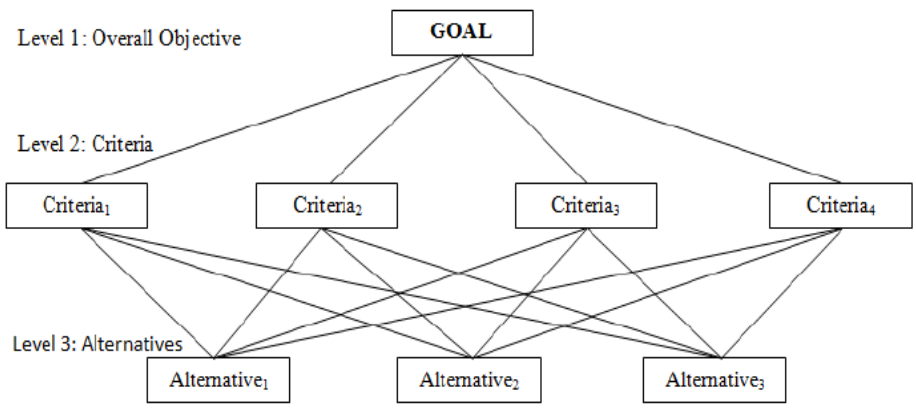

Figure 1: Hierarchy Creation Process

The steps to be followed through the implementation process of AHP are as follows (Saaty, 1980):

Step 1: A comparison matrix is created where binary comparisons will be made. Each participant completes its assessment according to the AHP Significance Scale developed by Saaty (1980). The Importance Scale and the values that each item can take are as in Table 4 (Saaty, 1980):

Table 4: AHP Significance Scale

Value	Definition
1	When both factors are of equal importance
3	When factor 1 is more important than factor 2
5	When factor 1 is very important than factor 2
7	The fact that factor 1 has a very strong importance compared to factor 2
9	The fact that factor 1 has absolute superior importance compared to factor 2
2, 4, 6, 8	Intermediate values

According to the AHP Significance Scale, the participants evaluate the factors mutually and obtain binary comparison matrices so that the importance of the priorities in each component is determined. As a result of the comparison, a square matrix is obtained in which the values on the diagonal are equal to 1 (Önder and Önder, 2018):

Table 5: Binary Comparison Matrix on Criteria

	Criterion 1	**Criterion 2**	…..	**Criterion n**
Criterion 1	1	W1/W2	…..	W1/Wn
Criterion 2	W2/W1	1	…..	W2/Wn
…..	**….**	**…..**	1	
Criterion n	Wn/W1	Wn/W2	…..	1

Step 2: The created comparison matrix is normalized (standardized). For the standardization, column totals are taken and each value is divided by its own column total. Thus, a standardized matrix is obtained.

Step 3: By taking the arithmetic average of the line elements in the normalized matrix, the criteria weights are obtained.

Step 4: At this stage, the consistency rate (CR) is checked. Since the AHP method reflects the evaluations of decision makers, some inconsistent rates may arise. The consistency rate should be calculated to determine these inconsistent rates in AHP. At this stage, the Consistency Ratio (CI), that is, the index value should be calculated. The formula used for the consistency ratio value is as follows.

$$\underline{CI = \lambda max - n}$$
$$n - 1$$

In the formula above, CI indicates the consistency index, λmax is the largest eigenvector in the matrix, and n indicates the number of elements in the matrix. Another value required to calculate the consistency rate is the Randomness Index (RI). To get the value of RI, the value corresponding to n is taken in the random index table (Önder & Önder, 2018). Random Index values are given in Table 6 (Saaty, 1980):

Table 6: Random Index (RI) Values

N	1	2	3	4	5	6	7	8	9	10
RI	0	0	0,58	0,9	1,12	1,24	1,32	1,41	1,45	1,49

Finally, the "Consistency Rate (CR)" is obtained by the ratio of CI to RI. In AHP applications, the fact that CR is less than 0.1 indicates that the application is consistent (Saaty, 1980). After the analysis was completed, the responses of the participants whose CR value was above 0.1 were removed from the analysis and the analysis was continued with those whose consistency value was appropriate.

4. Results

The AHP results obtained for each sub-dimension of the performance indicators are as follows:

4.1. Findings Related to Finance Sub-Dimension

With the answers of 6 participants whose CR consistency values were below 0.1 in the finance sub-dimension, AHP analysis was completed and shown in Table 7 (CR / K1: 0.08; K2: 0.07; K3: 0.04; K4: 0 , 09; K5: 0.09; K6: 0.05).

Table 7: Finance Sub-Dimension AHP Results

Items	**K1**	**K2**	**K3**	**K4**	**K5**	**K6**	**Geo. Mean**	**Ranking**
F4	0,14	0,15	0,08	0,25	0,13	0,11	0,13	1
F5	0,18	0,17	0,09	0,11	0,08	0,11	0,12	2
F3	0,16	0,10	0,08	0,23	0,02	0,12	0,10	3
F7	0,14	0,12	0,08	0,08	0,06	0,09	0,09	4
F2	0,03	0,04	0,32	0,03	0,19	0,20	0,09	5
F6	0,10	0,09	0,08	0,09	0,08	0,09	0,09	6
F1	0,07	0,04	0,16	0,02	0,20	0,16	0,08	7
F9	0,05	0,10	0,03	0,06	0,08	0,04	0,05	8
F8	0,05	0,10	0,03	0,06	0,06	0,04	0,05	9
CR	**0,08**	**0,07**	**0,04**	**0,09**	**0,09**	**0,05**		

The revised items obtained by calculating the geometric mean of the criterion weights of 9 items in the finance sub-dimension is as follows:

Revised Performance Indicators for Finance Sub-dimension	
1	The ratio of TÜBİTAK project revenues to total income
2	Ratio of international project revenues to total income
3	The ratio of research and development income to total income
4	The ratio of project revenues carried out in the technopark to total income
5	Number of incomes from student enrollments to total income (private foundation universities)
6	Ratio of other public and private sector financed project revenues to total revenue
7	Occupancy rates by years (private foundation universities)

8	The ratio of donation income to total income
9	Ratio of rental income to total income

4.2. Findings Related to Stakeholder Sub-Dimension

With the answers of 5 participants whose CR consistency values were below 0.1 in the stakeholders sub-dimension, AHP analysis was completed and shown in Table 8 (CR / K1: 0.07; K2: 0.09; K3: 0.07; K4: 0 , 04; K5: 0.09).

Table 2: Stakeholder Sub-Dimension AHP Results

Items	**K1**	**K2**	**K3**	**K4**	**K5**	**Geo. Mean**	**Ranking**
S1	0,15	0,41	0,32	0,15	0,18	0,22	1
S3	0,17	0,07	0,08	0,18	0,15	0,12	2
S2	0,16	0,01	0,09	0,16	0,17	0,09	3
S6	0,08	0,07	0,06	0,08	0,08	0,07	4
S5	0,07	0,07	0,08	0,07	0,07	0,07	5
S7	0,08	0,06	0,06	0,09	0,05	0,07	6
S4	0,07	0,02	0,08	0,07	0,08	0,06	7
S10	0,06	0,06	0,05	0,06	0,04	0,05	8
S8	0,04	0,07	0,06	0,04	0,05	0,05	9
S9	0,03	0,06	0,06	0,04	0,04	0,04	10
CR	**0,07**	**0,09**	**0,07**	**0,04**	**0,09**		

The revised items obtained by calculating the geometric mean of the criterion weights of 10 items in the finance sub-dimension is as follows:

Revised Performance Indicators for Stakeholder Sub-dimension	
1	Satisfaction rate and satisfaction survey results of all stakeholders
2	Employment rate of graduates
3	Individual counseling ratio
4	Number of training and certificate programs given by distance education for employees and students
5	Number of course materials offered for students with disabilities
6	The number of technoparks, socioparks, application research centers and the rates of students served in these institutions
7	The ratio of the number of disabled-friendly buildings to the total number of buildings
8	Number of cooperation protocols with institutions (Public and private institutions)
9	Number of club activities carried out by student communities
10	Participation rate of students in social responsibility activities

4.3. Findings Related to Learning and Development Sub-Dimension

With the answers of 7 participants whose CR consistency values were below 0.1 in the learning and development sub-dimension, AHP analysis was completed and shown in Table 9 (CR/ K1: 0,06; K2: 0,07; K3: 0,06; K4: 0,05; K5: 0,08; K6: 0,04; K7: 0,05).

Table 3: Learning and Development Sub-Dimension AHP Results

Items	K1	K2	K3	K4	K5	K6	K7	Geo. Mean	Ranking
L3	0,49	0,28	0,12	0,22	0,32	0,40	0,22	0,28	1
L1	0,11	0,28	0,37	0,19	0,15	0,21	0,22	0,20	2
L2	0,10	0,28	0,24	0,15	0,09	0,18	0,15	0,16	3
L5	0,09	0,08	0,11	0,16	0,30	0,09	0,14	0,12	4
L4	0,17	0,04	0,11	0,24	0,07	0,10	0,23	0,11	5
CR	**0,06**	**0,07**	**0,06**	**0,05**	**0,08**	**0,04**	**0,05**		

The revised items obtained by calculating the geometric mean of the criterion weights of 5 items in the finance sub-dimension is as follows:

	Revised Performance Indicators for Learning and Development Sub-dimension
1	The ratio of the number of academic staff sent to universities abroad to the total number of academic staff
2	Proportion of students participating in the exchange program
3	Number of cooperation protocols with universities operating abroad and abroad
4	Number of students participating in innovation and entrepreneurship activities
5	Number of supports provided by the project writing office

4.4. Findings Related to Internal Processes Sub-Dimension

With the answers of 7 participants whose CR consistency values were below 0.1 in the internal processes sub-dimension, AHP analysis was completed and shown in Table 10 (CR/ K1: 0,02; K2: 0,07; K3: 0,03; K4: 0,08; K5: 0,07; K6: 0,09; K7: 0,03).

Table 4: Internal Processes Sub-Dimension AHP Results

Items	K1	K2	K3	K4	K5	K6	K7	Geo. Mean	Ranking
P1	0,21	0,39	0,36	0,34	0,34	0,28	0,20	0,29	1
P2	0,33	0,06	0,29	0,18	0,23	0,15	0,35	0,20	2
P4	0,25	0,03	0,06	0,11	0,07	0,11	0,21	0,10	3
P5	0,06	0,11	0,06	0,12	0,17	0,17	0,06	0,10	4
P3	0,07	0,04	0,14	0,12	0,08	0,11	0,08	0,09	5
P6	0,06	0,32	0,06	0,06	0,05	0,09	0,07	0,08	6
CR	**0,02**	**0,07**	**0,03**	**0,08**	**0,07**	**0,09**	**0,03**		

The revised items obtained by calculating the geometric mean of the criterion weights of 6 items in the finance sub-dimension is as follows:

	Revised Performance Indicators for Internal Processes Sub-dimension
1	Accredited department / program ratio
2	Number of students / academic staff ratio
3	Average hours per week per instructor

4	Number of in-service training activities and the proportion of staff participating in these activities
5	Proportion of undergraduate students graduating in normal period
6	Number of social, sportive, cultural activities organized for the personnel

4.5. Findings Related to Education and Research Sub-Dimension

With the answers of 5 participants whose CR consistency values were below 0.1 in the education and research sub-dimension, AHP analysis was completed and shown in Table 11 (CR/ K1: 0,02; K2: 0,09; K3: 0,08; K4: 0,09; K5: 0,08).

Table 5: Education and Research Sub-Dimension AHP Results

Items	**K1**	**K2**	**K3**	**K4**	**K5**	**Geo. Mean**	**Ranking**
E8	0,19	0,17	0,04	0,15	0,16	0,13	1
E6	0,17	0,21	0,03	0,12	0,22	0,12	2
E7	0,19	0,11	0,03	0,15	0,21	0,11	3
E3	0,11	0,07	0,20	0,06	0,07	0,09	4
E9	0,19	0,12	0,02	0,18	0,05	0,08	5
E4	0,03	0,08	0,12	0,07	0,04	0,06	6
E2	0,04	0,05	0,21	0,03	0,07	0,06	7
E5	0,03	0,03	0,11	0,12	0,04	0,06	8
E1	0,03	0,04	0,17	0,02	0,07	0,05	9
CR	**0,02**	**0,09**	**0,08**	**0,09**	**0,08**		

The revised items obtained by calculating the geometric mean of the criterion weights of 9 items in the finance sub-dimension is as follows:

Revised Performance Indicators for Education and Research Sub-dimension	
1	Number of total publications and scientific activities (articles, congresses, conference papers, exhibitions, concerts, performance etc.) per faculty member
2	University's place in national and international academic rankings
3	Number of full text publications (SCI-expanded, SSCI and AHCI) published in the evaluation year per faculty member
4	Number of faculty members going abroad for research or education / Total number of faculty members
5	Number of DPT, TÜBİTAK and other publicly funded projects per faculty member
6	Joint higher education program, certificate program etc. carried out with international institutions and organizations. number
7	Number of activities organized within the scope of R&D and innovation activities
8	Number of open project areas (Project Space) where private sector and project ideas can meet 24/7
9	Number of courses in entrepreneurship and number of students attending these courses

4.6. Findings Related to Institutional Image Sub-Dimension

With the answers of 7 participants whose CR consistency values were below 0.1 in the institutional image sub-dimension, AHP analysis was completed and shown in Table 12 (CR/ K1: 0,08; K2: 0,07; K3: 0,06; K4: 0,07; K5: 0,09; K6: 0,08; K7: 0,05).

Table 6: Institutional Image Sub-Dimension AHP Results

Items	**K1**	**K2**	**K3**	**K4**	**K5**	**K6**	**K7**	**Geo. Mean**	**Ranking**
I2	0,31	0,20	0,17	0,08	0,22	0,09	0,20	0,17	1
I4	0,09	0,11	0,19	0,30	0,09	0,31	0,14	0,16	2
I5	0,17	0,14	0,11	0,21	0,08	0,22	0,15	0,15	3
I1	0,16	0,26	0,17	0,05	0,22	0,05	0,20	0,13	4
I3	0,13	0,15	0,24	0,06	0,16	0,08	0,19	0,13	5
I6	0,05	0,06	0,06	0,24	0,15	0,18	0,07	0,10	6
CR	**0,08**	**0,07**	**0,06**	**0,07**	**0,09**	**0,08**	**0,05**		

The revised items obtained by calculating the geometric mean of the criterion weights of 6 items in the finance sub-dimension is as follows:

Revised Performance Indicators for Institutional Image Sub-dimension	
1	Number of faculty members going abroad for research or education / Total number of faculty members
2	The number of promotional activities carried out at national and international level for university candidates
3	Number of foreign graduate and undergraduate students / Total number of students
4	Joint higher education program, certificate program etc. carried out with international institutions and organizations. number
5	The number of guest researchers from abroad and the satisfaction rate of these researchers
6	Number of activities for graduates

5. Conclusion

According to the finance sub-dimension AHP results, first 3 dimensions are; TÜBİTAK received project income, international project income and research and development income. The first dimension for private foundation universities is the income from student enrollments. Donation and rental income remained at the top. In public universities, all of the staff salaries and substantial expenses are covered by public resources. However, in line with the Public Financial Control and Management Law No. 5018, it is stated that performance-based budgeting will be implemented in public institutions, including universities (YÖK, 2015). In this context, universities need TÜBİTAK projects and projects supported by international funds etc. in order to increase performance quality and access different financial resources.

“Stakeholder satisfaction and satisfaction survey results” rank first in the stakeholders sub-dimension. Today, with the spread of accreditation processes and quality assurance systems, many universities are developing various strategies to measure and evaluate the satisfaction of stakeholders. For example, Aydin University (2020) stated all the details of the process in the “Stakeholder Satisfaction Policy” on its website, Ankara University (2020) announced the “Strategy Development Department External Stakeholder Satisfaction Survey” online. In the stakeholder sub-dimension, the second item with the highest criterion weight is the employment

rate of graduates. Employment rates are one of the most important criteria for parents and students in university preferences (Soutar & Turner, 2002; Moogan & Baron, 2003; Uncle, 2011). Universities provide opportunities for students to post-graduate job opportunities, internships, 2nd foreign language, etc. and they should be supported by various courses and certification.

“The ratio of the number of academic staff sent to universities abroad to the number of academic staff in the first place in the learning and development sub-dimension”; the second rank is “The rate of students participating in the exchange program.” Internationalization in higher education is one of the topics that YÖK has emphasized most recently. YÖK published the Internationalization Strategy Document in Higher Education 2018-2022 (YÖK, 2017) in order to guide universities in this field. One of the strategy mentioned at the document is "Turkey is providing to become a center of attraction in the higher education area" which has "Objective 1.4: Increasing the number of participants in international student and faculty exchange in the field of cooperation and exchange programs". In this context, the rates of faculty and students participating in exchange programs are an important performance indicator for universities.

In the sub-dimension of internal processes, the items with the highest criterion weight are “Accredited department / program ratio,” “Number of students / faculty ratio” and “Average weekly hours per academic staff member.” The findings obtained are in line with the Strategic Planning Guide for Universities (Ministry of Development, 2018b) and the accreditation, academic staff / student ratio and faculty course load, which the recent YÖK emphasizes. Prominent indicators in the education and research sub-dimension are: “Total number of publications and scientific activities per faculty member,” “The place of the university in the national and international academic ranking” and “Number of full-text publications per academic year.” In this context, universities require more faculty members to implement various incentive programs and arrangements that will increase the broadcast performance and increase the institution's position in the national / international rankings. Similarly, from the related findings, it is concluded that university administrators give importance to “Number of teaching staff who go abroad for research or education” and “Number of promotional activities carried out at national and international level for university candidates” in order to strengthen the institutional image.

According to the AHP analysis conducted at the end of the study, a set of 45-item performance indicators, which are ranked according to criterion weights under 6 main subtitles, namely financial, stakeholders, learning and development, internal processes, education and research and institutional image. It is seen that the findings are in line with the recent the Council of Higher Education policies, Strategic Planning Guide for Universities by the Ministry of Development (2018b) and the Higher Education Council's 2016-2020 Strategic Plan (YÖK, 2015).

6. Recommendation

Conducting different researches for each performance indicators sub-dimension i.e. stakeholders, education research, learning and development will make important contributions to the field and strategic planning topics. Income from student records in the financial resources of foundation universities is an important income item. In addition, private foundation universities donate income, dormitory income, etc. It differs relatively from state universities in matters. At this point, the performance indicators in the financial sub-dimensions should be supported by independent or comparative research, based on the university relations with the owner foundation.

When the strategic plans of the universities are examined within the scope of the research, the number of publications in general, the ratio of accredited departments, international projects etc. performance indicators appear to be in the first place. However, especially when examining the strategic plans of well-known universities around the world, besides physical or educational strategic goals, it is seen that more inclusive strategic goals are included. For example, “Raising the minds that will inspire the world at Yale University (Yale University, 2018)” or “Making Oxford experience the best experience in the student's life (Oxford University, 2018)”. These universities also include performance indicators including a series of activities and practices in order to achieve the objectives mentioned in their strategic plans. Universities operating in Turkey should complete basic indicators rapidly and spend time to actualize more visionary strategic goals.

Strategic planning became widespread in Turkey in recent years and a new legislation is mandated for by public administrations. At this point, significant deficiencies are noticed when the strategic plans and performance indicators of the universities are analyzed. Even creating performance indicators based on concrete data such as measurable and ratio / number, which is one of the most basic principles, has been neglected in some strategic plans. In this context, YÖK should increase the number of guide activities and documentation to universities, especially in printed publications, video recordings and university trainings, on strategic planning and performance indicators. Under the leadership of YÖK, policy makers should initiate such a planning and create a weighted list of ranking criteria under various subtitles. In this way, universities will be able to make adjustments according to these criteria while creating performance indicators.

References

Altun, Y. (2019). *Türkiye'de temel kamu hizmetlerinde performans göstergelerinin değerlendirilmesi: adalet, içişleri, maliye, milli eğitim ve sağlık bakanlığı örnekleri* [Evaluation of the performance indicators in basic public services in Turkey: justice, interior, finance, education and health ministry national samples]. (Master thesis). Yıldırım Beyazıt University, Ankara.

Amca, H. (2011). *Üniversitelerin tercih edilmesini etkileyen faktörler* [Factors affecting the preference of universities]. Retrieved on December 5, 2019, from http://www.emu.edu.tr/amca/universitelerinTercihiEdilmesiniEtkileyenFaktorler.pdf

Ankara University, (2018). *Ankara üniversitesi stratejik planı* [Ankara university strategic plan]. Retrieved on June 1, 2019, from http://www.sp.gov.tr/upload/xSPStratejikPlan/files/j7zay+Ankara_Universitesi_Stratejik_Plani.pdf

Ankara University, (2020). *Strateji geliştirme daire başkanlığı dış paydaş memnuniyeti anketi*. [Strategy development department external stakeholder satisfaction survey]. Retrieved on June 1, 2019, from https://www.ankara.edu.tr/strateji-gelistirme-daire-baskanligi-dis-paydas-memnuniyeti-anketi/

Arif, M., & Smiley, F. M. (2004). Baldrige theory into practice: a working model. *International Journal of Educational Management*, 18(5), 324-328.

Atatürk University, (2018). *Atatürk üniversitesi stratejik planı* [Atatürk university strategic plan]. Retrieved on June 1, 2019, from http://www.sp.gov.tr/upload/xSPStratejikPlan/files/92lma+Stratejik_Plan_2014-2018.pdf

Aydın University, (2020). *Paydaş memnuniyeti politikası* [Stakeholder satisfaction policy]. Retrieved on December 5, 2019, from https://www.aydin.edu.tr/tr-tr/iau-akkinda/kurumsal/Pages/paydas_memnuniyeti_politikasi.aspx

Burke, J. C., & Minassians, H. P. (2002). Measuring down and up: The missing link. *New Directions for Institutional Research,* 2002(116), 97-114.

Conlon, M. (2004). Performance indicators: Accountable to whom? *Higher Education Management and Policy*, 16, 41–48.

Gazi University, (2018). *Gazi üniversitesi stratejik planı* [Gazi university strategic plan]. Retrieved on June 1, 2019, from http://www.sp.gov.tr/upload/xSPStratejikPlan/files/Cv3dA+GAZI_UNIVERSITESI_2014-2018_STRATEJIK_PLANI.pdf

Hastürk, M. (2009). *Stratejik planlama ve performans esaslı bütçeleme* [Strategic planning and performance based budgeting]. Retrieved on June 8, 2019, from http://www.erkankaraaslan.org/Includes/userfiles/admin/File/4nolumakale

Ministry of Development, (2018a). *Kamu idareleri için stratejik planlama kılavuzu* [Strategic planning guide for public administrations]. (3rd Ed.) Retrieved on June 8, 2019, from http://www.sp.gov.tr/upload/xSpKutuphane/files/VrllQ+Kamu_Idareleri_Icin_Stratejik_Planlama_Kilavuzu.pdf

Ministry of Development, (2018b). *Üniversiteler için stratejik planlama rehberi* [Strategic planning guide for universities]. Retrieved on June 8, 2019, from http://www.sp.gov.tr/upload/xSpKutuphane/files/wtnii+Universiteler_Icin_Stratejik_Planlama_Rehberi.pdf

Ministry of Development, (2019). *Kamuda stratejik yönetim projesi* [Strategic management project in the public sector]. Retrieved on June 8, 2019, from http://www.sp.gov.tr/tr/kurum/g/du/kurum/Devlet+Universiteleri

Karakaya, G. (2019). *Yerel yönetimlerde kurumsal risk yönetimi uygulamalarının analitik hiyerarşi süreci (AHP) modeli ile incelenmesi: istanbul büyükşehir belediyesi (İBB) örneği* [Analysis of corporate risk management practices in local governments with an analytical hierarchy process (AHP) model: an example of istanbul metropolitan municipality]. (Doctoral thesis). Istanbul Commerce University, Istanbul.

Kueng, P. (2000). Process performance measurement system - a tool to support process-based organizations. *Total Quality Management,* 11(1):67–85.

Marmara University, (2018). *Marmara üniversitesi stratejik planı* [Marmara university strategic plan]. Retrieved on June 1, 2019, from http://www.sp.gov.tr/upload/xSPStratejikPlan/files/djquO+MARMARA_UNIVERSITESI_2017-2021_STRATEJIK_PLANI.pdf

Moogan, Y. J. & Baron, S. (2003). An analysis of student characteristics within the student decision making process. *Journal of Further and Higher Education,* 27(3), 271-287.

Mutluer, K. M., Öner, E. & Kesik, A. (2005). *Bütçe hukuku* [Budget law]. Bilgi University Publications: Istanbul.

Northeastern Illinois University, (2018). *Northeastern illinois university kpi progress report*. Retrieved on June 5, 2019, from https://www.neiu.edu/about/strategic-plan/key-performance-indicators/kpi-progress-report

Ohio State University, (2019). *Ohio state's strategic plan. time and change: enable, empower and ınspire.* Retrieved on June 5, 2019, from https://president.osu.edu/assets/uploads/PDFs/WEB_Ohio%20State_Strategic_Plan_Narrative_.pdf

Önder, G., & Önder, E. (2018). Çok kriterli karar verme yöntemleri [Multi-criteria decision making methods] In B. F. Yıldırım (Ed.) ve E. Önder (Ed.), *Analitik Hiyerarşi Süreci* [Analytical Hierarchy Process]. 2nd Edition, Bursa: Dora Publishing.

Oxford University, (2018). *Oxford university strategic plan 2013-2018*. Retrieved on June 5, 2019, from https://www.ox.ac.uk/sites/files/oxford/field/field_document/Strategic%20Plan%202013-18.pdf

Özdemir A. & Tüysüz F., (2017). An integrated fuzzy DEMATEL and fuzzy ANP based balanced scorecard approach: application in turkish higher education institutions. *Journal of Multiple-Valued Logic & Soft Computing.* Volume 28, Number 2-3 (2017) p. 289-310.

Parmenter, D. (2010). *Key performance indicators (KPI): Developing, implementing, and using winning KPI's.* Hoboken, NJ: John Wiley & Sons Inc.

Pfeffer, J. & Sutton, R. I. (2006). *Hard facts, dangerous halftruths, and total nonsense: Profiting from evidence-based management*, Cambridge, MA: Harvard Business School Press.

Rhodes University, (2019). *Rhodes university 2017 annual report*. Retrieved on June 5, 2019, from https://www.ru.ac.za/media/rhodesuniversity/content/institutionalplanning/documents/annualreports/IPU_2017_ANNUAL_REPORT.pdf

Saaty, T. L., (1980). *The analytic hierarchy process*. McGraw-Hill, New York.

Sakarya University, (2018). *Sakarya üniversitesi stratejik planı* [Sakarya university strategic plan]. Retrieved on June 1, 2019, from http://www.sp.gov.tr/upload/xSPStratejikPlan/files/l4qOG+SU.pdf

Soutar, G. & Turner, J. (2002). Students' preferences for university: A conjoint analysis. *The International Journal of Educational Management,* 16(1), 40-45.

Tayyar, N., Akcanlı, F., Genç, E., & Erem, I. (2014). BİST'e kayıtlı bilişim ve teknoloji alanında faaliyet gösteren işletmelerin finansal performanslarının analitik hiyerarşi prosesi (ahp) ve gri ilişkisel analiz (gia) yöntemiyle değerlendirilmesi [Evaluation of financial performance of companies operating in the field of informatics and technology registered in BIST with analytical hierarchy process (ahp) and gray relational analysis (gia) method], *Muhasebe ve Finansman Dergisi* [Journal of Accounting and Finance], (61), 19-40.

Terkla, D. (2011). The most common performance indicators for institutions and their boards. *Trusteeship*. January/February 19(1), 1-5.

University of Kentucky, (2018). *University of kentucky strategic plan 2015-2020*. Retrieved on June 5, 2019, from http://www.uky.edu/sotu/sites/www.uky.edu.sotu/files/2Strategic%20Plan%202015_2020_Metrics.pdf

University of North Carolina, (2018). *Facilities management fy 2017 balanced scorecard university of north carolina.* Retrieved on June 5, 2019, from https://facilities.uncc.edu/sites/facilities.uncc.edu/files/media/Strategic%20Planning/BSC_January_2017.pdf

Yale University, (2018). *Yale university sustainability plan 2025*. Retrieved on June 5, 2019, from https://sustainability.yale.edu/sites/default/files/sustainability_plan_2025.pdf

Yıldız Technical University, (2018). *Yıldız teknik üniversitesi stratejik planı* [Yıldız technical university strategic plan]. Retrieved on June 1, 2019, from http://www.sp.gov.tr/upload/xSPStratejikPlan/files/mGRs0+Yildiz_Teknik_Universitesi_2016-2020_Stratejik_Plani.pdf

YÖDEK, (2007). *Yükseköğretim akademik değerlendirme ve kalite geliştirme komisyonu raporu* [Higher education academic evaluation and quality improvement commission report]. Retrieved on June 8, 2019, from http://www.yodek.org.tr/yodek/files/7aa12f8d2582deb44d4249c7aa4a2020.pdf

YÖK, (2007). *Yükseköğretim kurulu türkiye'nin yükseköğretim stratejisi* [The council of higher education, Higher Education strategy]. Retrieved on June 8, 2019, from https://www.yok.gov.tr/Documents/Yayinlar/Yayinlarimiz/Turkiyenin-yuksekogretim-stratejisi.pdf

YÖK, (2015). *Yükseköğretim kurulu stratejik planı 2016-2020* [The council of higher education strategic plan 2016-2020]. Retrieved on June 8, 2019, from https://www.yok.gov.tr/Documents/Kurumsal/strateji_dairesi/YOK_Stratejik_Plan_2016_2020.pdf

YÖK, (2017). *Yükseköğretimde uluslararasılaşma strateji belgesi 2018-2022* [Internationalization strategy document in higher education 2018-2022]. Retrieved on June 8, 2019, from https://www.yok.gov.tr/Documents/AnaSayfa/Yuksekogretimde_Uluslararasilasma_Strateji_Belgesi_2018_2022.pdf

YÖK, (2019). *YÖK vakıf yükseköğretim kurumları 2019 kitapçığı* [YÖK private foundation universities 2019 booklet]. Retrieved on June 8, 2019, from https://www.yok.gov.tr/HaberBelgeleri/Haber%20%c4%b0%c3%a7erisindeki%20Belgeler/Yay%c4%b1nlar/2019/Vakif_Yuksekogretim_Kurumlari_2019.pdf

Yüksel, A. (2014). *Türkiye'de devlet üniversitelerinde uygulanan performans esaslı bütçeleme sisteminin vakıf üniversitelerine uygulanabilirliği ve veri zarflama analizi ile fakültelerin etkinliklerinin ölçülmesi* [The feasibility of performance-based budgeting system in the state universities to private universities in Turkey and measurement of the effectiveness of faculties with data envelopment analysis]. (Doctoral thesis), Başkent University, Ankara.

9 Eylül University, (2018). *Dokuz eylül üniversitesi stratejik planı* [9 eylül university strategic plan]. Retrieved on June 1, 2019, from http://www.sp.gov.tr/upload/xSPStratejikPlan/files/fnXOa+DEU-2016-2020-SP.pdf

19 Mayıs University, (2018). *Ondokuz mayıs üniversitesi stratejik planı* [19 mayıs university strategic plan]. Retrieved on June 1, 2019, from http://www.sp.gov.tr/upload/xSPStratejikPlan/files/qyqLw+planson.pdf