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Full Length Research Paper

The level of understanding scientific and engineering practices in light of the next generation science standards among preservice student teachers

Alebous Tahani

Department of Curriculum and Instruction, Faculty of Science Education, University of World Islamic Sciences and Education, Jordan.

The purpose of the study is to investigate the level of understanding of first three grade preservice teachers of the scientific and engineering practices according to next generation science standards (NGSS) at the World Islamic Sciences University. The sample of the study consisted of 154 fourth year female student teachers at International Islamic Sciences University in the academic year 2019/2020. The study administered a questionnaire containing 32 items that show the indicators of scientific and engineering practices. Its validity and reliability were checked by a committee of experts and by calculating Cronbach's Alpha coefficient which was 0.90. The findings of the study showed that the level of the student teachers' understanding of scientific and engineering practices in light of the next generation of science standards was low. The study recommended the need to reconsider the plans of the bachelor's degree class teacher and the importance of providing a science laboratory to teach scientific courses at the university.

Key words: First three grade teachers, scientific and engineering practices, Science Standards (NGSS).

INTRODUCTION

In light of the rapid changes in science, scientific knowledge and technological revolution, the need for development in scientific education programs became urgent, which led to global reform efforts in science. Among the most prominent projects and programs are Science curriculum reform based on the interaction between science, technology, and society (STS), Science for All Americans of the American Association for the Advancement of Science (AAAS), National Standards for Scientific Education (NSES) issued by the National Research Council (NRC), Science, Technology, Engineering and Mathematics Education (STEM), and Next Generation Science Standards (NGSS). Among the most important things that these projects focused on are: education quality, education for understanding, constructivism and scientific culture, scientific inquiry, problem solving, and critical thinking. Many countries designed their educational curricula for the sciences based on the thinking and educational developments introduced by these reform projects.

Bybee (2010) pointed out those learning outcomes in current science programs are no longer sufficient to

prepare students for life and work in the twenty-first century, confirming that there is a great gap between the skills that school students learn and those they need in life and work in the knowledge-based economy. The science curricula should be blamed for not being able to prepare students for the current era. Therefore, the National Research Council (NRC: 2012) has presented a general framework for teaching science from kindergarten to twelfth grade (k-12) based on three pillars; The central ideas, overlapping concepts, scientific and engineering practices, with the aim of providing students with the skills of the twenty-first century. These three pillars have been integrated and interconnected together in the so-called Next Generation Science Standards: NGSS, which aims to prepare students for work, life and citizenship by adopting the term scientific and engineering practices - as an alternative to the idea of "skills". This calls for coordination between knowledge and skill at the same time. Scientific and engineering practices are considered a new start in science education, as they focus on students' possession of knowledge and skill at the same time. This means linking theory with application when teaching science, which is what we seek in science education (NGSS, 2013).

With these developments and radical changes in the science curricula in the Hashemite Kingdom of Jordan, educators agree that the success of these projects and achievement of their goals is primarily linked to the science teacher, so the need is urgent for an efficient teacher who can deal with the elements of this process in a way that helps to achieve the educational goals. It is unable to activate any reform in an educational system without qualified science teachers so that they combine the two knowledge: scientific knowledge in the specialization and educational knowledge to teach the developed science curricula. It is familiar with modern educational concepts on which it is built and can deal with developed textbooks and mastery of the skills that help him/her to teach science. It emphasizes knowledge and practices for the teacher to focus on pre-service teacher preparation programs on the educational preparation side, as it represents an important aspect of the teacher preparation program plans that aim to prepare the student / teacher from the educational aspect.

Also, all science standards for global, regional and local science teachers focus on the educational knowledge of a science teacher and consider it a basic standard within its standards. This confirms the significance of knowledge for the science teacher of the first three grades of educational developments that are no less significant than the specialized scientific knowledge. Studies by Al-Jarjawi and Nashwan (2006) and Al-Aalemat (2010) indicated that there is a decrease in the level of that knowledge, which limits teaching practices.

Whereas, the basic competencies of the general framework for science education in Jordan are in line with the competencies of the twenty-first century that were developed by the National Research Centre (NRC, 2012); it emphasized that the main goal of science education is to develop mind habits, preoccupation with scientific investigation and solving problems. It is what the Next Generation Science Standards (NGSS) aim at through scientific and engineering practices in which students learn content by studying a phenomenon in their surroundings, so that they follow the behaviour of the scientist to study this phenomenon and find solutions or design models (engineering). Therefore, the development of scientific and engineering practices for students require the teacher to play a different role from his/her role in traditional teaching, to become the guide, expert, supporter of students' learning, and the provider of continuous and direct feedback to them (Aspy et al., 1993). From this point,there is need for teacher preparation and training for his/her new roles, for without a trained and learned teacher who is fully aware of his/her role, no educational system can achieve its goals, and studies have shown the need to reconsider the content of teacher training and preparation programs to meet their needs and fill the gap in their competencies (Toqan, 2005). As it is significant for pre-service grade teachers to have have educational developments in which the science curriculum is built, this study reveals the level of understanding of the first three grade preservice teachers of scientific and engineering practices in light of next generation science standards (NGSS).

Statement of problem

From the experience of the researcher, it was observed that there is a clear weakness among teachers in general and first-grade teachers in particular in public and private schools in Jordan. It is represented by how to change their teaching practices in line with the requirements of the twenty-first century and the new roles of both teachers and students in the educational process. The World Bank report raised an important issue about education in the Jordan 2017 Ministry of Education, (2018), International Bank (2012), noting that teachers in Jordan possess insufficient skills, and that in-service training is limited.

The results of the Jordanian students in the Program of International Student Assessment (PISA) indicated that the test results of Jordanian students for the year (2018) reached 400 point, which is less than the acceptable average of the Organization for Economic Cooperation and Development (489 points), so Jordan was ranked 59, and the universally accepted rank is 24 (PISA, 2018). Several studies indicated the need for teachers to undergo focused and convincing training programs in order to achieve the goals of the Jordanian Ministry of Education, such as the study of Amayrah et al. (2012)

which showed that the degree of possession and practice of basic stage teachers to the principles of knowledge economy was of a moderate degree; the study of Al-Jaafara and Al-Zaydyeen (2016) showed that the perspectives of school principals and school supervisors in possession of primary school teachers' degree were at a moderate level; the study of Al-mutiri A, Al-mafaraj (2007) recommended the followings: to implement training programs in order to prepare and train teachers to keep pace with the accelerating developments of the age; to move from traditional training to modern technological training; to stand by all means on the international contemporary trends in developed countries in the field of preparing and training teachers and making use of them in proportion to the specificity of each country and its educational system.

The teacher has the primary role to play in the educational process and performs the vital function in the teaching process, so it is imperative to prepare the teachers professionally in line with the developments in the twenty-first century.The educational process in Jordan is witnessing a remarkable development and a qualitative shift in education. It has sought through the development of curricula for the educational stages from kg-12 with the aim of bringing about changes in educational outcomes.Currently, after the new released standards (NGSS -the Next Generation Standards for Science), there arouse interest in the education system, for several reasons, like preparing students for jobs so that they possess critical thinking and investigation-based problem solving skills (NGSS, 2012). Senider (2012), Senider et al., (2014), study ensured that scientific and engineering practices and training of science teachers on how to deal with science curricula and new strategies in teaching and evaluation have not been adequately taken care of. This requires determining what science teachers possess and what they have been trained on. Due to the lack of educational literature, addressing scientific and engineering practices in the light of NGSS of the first three grade pre-service teachers in Jordan, there is need to diagnose this reality, the knowledge related to these standards and to present proposals that help in employing them in educational programs and plans for student teachers before their graduation. Thus, the problem of the study is in accordance with this approach to identify the level of understanding of the first three grade pre-service teachers of scientific and engineering practices in light of the next generation Science Standards (NGSS).

Study questions

(i) What is the level of the first three grade pre-service teachers' understanding of scientific and engineering practices according to NGSS standards?
(ii) What is the effect of the studying year level on the evaluations of the first three grade pre-service teachers'

knowledge of scientific and engineering practices according to NGSS standards?

Study objectives

Exploring the level of the first three grades classroom teachers understanding of scientific and engineering practices; according to NGSS standards in the light of the difference in the studying year.

Study Significance

The importance of the study is presented in the advantages offered to the field of teaching science for the first three grades, through:

(i) Drawing universities' attention to the need of developing their teaching plans for the Bachelor's degree for classroom teacher major in the light of NGSS standards.
(ii) Directing the attention of higher education and the ministry of education towards the preparation of professional development programs for the first three grades teachers according to NGSS and providing necessary support to facilitate its implementation in the classroom.

Study limitations

The findings of the study is limited to:

Objective limitations: The study used NGSS (Next generation science standards) only.
Time limitations: The first semester of the academic year 2019/2020.
Place limitations: The World Islamic Sciences University.
Human limitations: Bachelor's students/ classroom teacher major.

The tools used in this study were developed by the researcher, depending on the validity and reliability coefficients. Psychometric properties were checked.

Definition of terms

Next Generation Science Standards (NGSS): New standards for teaching science are stated in the United States of America (NGSS Lead States, 2013). These were phrased into: pivoting ideas, overlapping concepts, science and engineering practices based on the general frame of teaching science from kindergarten to secondary stage.

Science and Engineering Practices: It is a NGSS domain referring to the applied aspect for those

standards. It consists of eight main practices used by scientists when;asking questions (for science) and defining problems (for engineering), developing and using models, planning and carrying out investigations, analyzing and interpreting data, mathematics and computational thinking, constructing explanations (for science) and designing solutions (for engineering), engaging in argument from evidence and obtaining, evaluating, and communicating information (NRC, 2012). These were measured through interviews prepared especially for measuring scientific and engineering practices (pre and post) for preservice teachers inside lectures as well as the samples' responses on the scientific and engineering practices questionnaire developed for the purposes of the current study.

Previous studies

Despite the importance of the first three grades teachers' knowledge of all educational developments in the field of their majors, the researcher found only a few studies on this particular topic. Staver (2007) indicated that our life is filled with the results of scientific investigations and engineering and technological developments. Therefore, students must be trained on how to conduct scientific inquiry. Furthermore, the findings of studies (Ambosaidi, 2013; Reiser et al., 2012) showed that there is a gap between theory and practice and there is a low level of applying scientific practices by science teachers.

In a dramatic response to embody the practical and applied picture to see the general framework for science education, the next generations of science standards NGSS were set in 2013 by the NRC council in cooperation with the National Academy of Science (NAS) and American Association for the Advancement of Science (AAAS) as well as National Science Teachers Association (NSTA), phrased to work through three dimensions at the same time inside the classroom (pivoting ideas, overlapping concepts, science and engineering practices). The National Science Teachers Association (NSTA) warned about the responsibility of science teachers to understand the general framework of science education and study it in all its details and focus on scientific and engineering practices in order for them to implement the vision of NGSS (Lead States, 2013: NGSS).

In another study (Duschi and Bybee, 2014; Boesdorfer and Staude, 2014), it was confirmed that the effective professional development starts when teachers realize what they are teaching in their classrooms and the practices they used before adopting NGSS directly. Kawasaki (2015) investigated in a qualitative study the ability of teachers to integrate scientific and engineering practices in their classroom practices. A sample of 7 intermediate stage teachers were interviewed, then a questionnaire was answered after visiting them in their classes. The researcher focused on the goals teachers seek to achieve at the end of the semester and the variety of strategies used by them to achieve the vision of NGSS. The findings of the study showed differences in teachers' ability to use these strategies, and Kawasaki attributed this disparity mainly to pre- and in-service teacher training and training programs. He recommended what he called: "Teacher NGSS Standards (NGSS) teachers " should be built on standards for the next generation of learners (NGSS Learners).

Brownstein and Horvath (2016) evaluated the performance of preservice teachers in applying scientific and engineering practices. The study adopted a qualitative approach by developing Educative Teacher Performance Assessment: EDTPA, 4 male teachers and 6 female teachers were trained for 90 h; then each one of them taught for 10 weeks in public schools. The teacher case was analyzed. Tthe results indicated that the most common practices undertaken by teachers were in the following order: the practice of analyzing and interpreting data, constructing interpretations, designing solutions, obtaining information and communicating with it; while the least practices were "asking questions".

Furthermore, Harris et al. (2017) evaluated science teachers and the results showed that most teachers are not well prepared to incorporate the proposed changes in NGSS into their curricula and educational plans. Based on the foregoing, it is clear that teachers are responsible for promoting their professional growth before and during the service through knowledge of educational developments and the need to employ them in their teaching. This would require high competence in proportion to their new tools as well as high competence in scientific and engineering practices.

METHODOLOGY

The researcher adopted the descriptive approach which is based on describing the phenomenon as in the real situation by collecting data from the educational field; thereafter, data were analyzed and results extracted.

Population and sample

The sample of the study consisted of 154 first degree student teachers at the World Islamic Sciences University in Jordan in the first semester of the academic year 2019/2020; they were selected through random sampling. The sample (50%) consists of female student teachers from the same university (300 teachers). Table 1 shows the numbers of student teachers from year one to year four.

Study tool

The study administered a questionnaire based on the description of (NGSS) standards of scientific and engineering practices (http://ngss.nsta.org/practicesfull.aspx). To ensure its validity, all the related standards were taken into consideration. They were categorized into eight domains, and then items were distributed into

Table 1. the numbers of student teachers from year one to four.

Study level	Numbers
First year	15
Second year	63
Third year	42
Fourth year	34
Total	154

Table 2. Reliability of the tool.

S/N		Cronbach-Alpha	Pearson
1	Asking questions (for science) and defining problems (for engineering)	0.81	0.87
2	Developing and using models	0.86	0.78
3	Planning and carrying out investigations	0.88	0.74
4	Analyzing and interpreting data	0.82	0.81
5	Using mathematics and computational thinking	0.80	0.86
6	Constructing explanations (for science) and designing solutions (for engineering) and engaging in argument from evidence	0.84	0.80
7	Obtaining, evaluating, and communicating information	0.86	0.83
	Total	0.90	0.88

The criteria used to determine the level of understanding is:(0.66- 1.66) low; (1.67-2.33) average; 2.34- 3.00) high.

the domains. The researcher presented the items to a committee of 12 experts from the faculties of education in the Jordanian universities. In order to ensure the importance and relevance of the items that were chosen, and based on the opinions of the arbitrators, the researcher chose the items that are most representative and important to the fields . The number of the items were 32; thereafter, it became 42 items which were distributed into eight domains. The researcher verified the validity of the tool.

Reliability of the tool

Reliability was confirmed using two methods: the internal consistency method using the Cronbach-Alpha equation, and the test-retest method. The two questionnaire was applied to 30 individuals from outside the study sample, and was re-applied after two weeks. The test reliability factor was calculated using Pearson correlation coefficient between the results of the two applications, as shown in Table 2.

FINDINGS

This part contains the results of the study obtained from the questions.

The first question: What is the level of the first three grade teachers' understanding of scientific and engineering practices according to NGSS standards?

To answer this question, means and standard deviations

of the first three grades teachers' understanding of scientific and engineering practices according to NGSS standards were calculated in general and for each domain. Table 3 shows the results. Table 3 shows that the level of classroom student teachers' understanding of scientific and engineering practices according to NGSS was low, as the total mean was 1.62 with a standard deviation of 0.34; the domains ranged between low and average levels as the means ranged between 1.45 and 1.72. Asking questions and defining problems domain came in the first rank with a mean of 1.72 and standard deviation of .39 at an average level. Furthermore, planning and investigations were carried out with a mean of 1.70 and standard deviation of 0.42 within an average level. Meanwhile, developing and using models domain came in the last rank with a mean of 1.55 and standard deviation of 0.41 at a low level. Moreover, analyzing and interpreting data domain came in the last rank with a mean of 1.45 and standard deviation of 0.36 at a low level. Regarding the items of each domain, they are as follows.

Asking questions and defining problems

Table 4 shows that the level of understanding of the classroom student teachers of scientific and engineering practices in light of the next generation of science standards for the items in the domain of asking questions

Table 3. Means and standard deviations of the first three grades teachers understanding of scientific and engineering practices according to NGSS arranged in descending order.

S/N		M	SD	RANK	Level
1	Asking questions and defining problems	1.72	0.39	1	Average
3	Planning and carrying out investigations	1.70	0.42	2	Average
5	Using mathematics and computational thinking	1.70	0.38	2	Average
7	Obtaining, evaluating, and communicating information	1.69	0.38	4	Average
6	Constructing explanations (for science) and designing solutions (for engineering) engaging in argument from evidence	1.56	0.41	5	Low
2	Developing and using models	1.55	0.41	6	Low
4	Analyzing and interpreting data	1.45	0.36	7	Low
	Total	1.62	0.34		Low

Table 4. Means, Standard Deviations and ranks for teacher students' understanding of scientific and engineering practices in the domain of asking questions and defining problems arranged in descending order.

S/N	Item	M	SD	Rank	Level
2	The teacher encourages students to ask questions showing understanding of the concept or phenomenon	2.01	0.81	1	Average
3	The teacher encourages students to ask questions that demonstrate their ability to apply concepts in new life situations	1.68	0.73	2	Average
1	The teacher encourages students to ask questions.	1.59	0.66	3	Low
4	The teacher encourages students to ask questions that lead them to produce new knowledge	1.59	0.67	3	Low
	Asking questions and defining problems	1.72	-039		Average

and defining the problem was average; the mean was 1.72 and the standard deviation of 0.39. The items came in the middle and low levels, as the means ranged between 2.01 to 1.59. Item 2 came first in the rank, which states: "The teacher encourages students to ask questions that show their level of understanding of the concept or phenomenon" ; it has a mean of 2.01 and standard deviation of 0.81. Item 3 came second in the rank which states, "The teacher encourages students to ask questions that show their ability to apply concepts in new life situations"; it has a mean of 1.68 and standard deviation of 0.73; it is on average level. Item 1 came last in the rank, which states that, "the teacher encourages students to ask questions" and Item 4 which states "The teacher encourages students to ask questions that lead them to produce new knowledge"; it has a mean of 1.59 and two standard deviations of 0.66 and 0.67 at a low level.

Planning and carrying out investigations

Table 5 shows that the level of understanding of the classroom student teachers of scientific and engineering practices in light of the next generation of science standards for the items in the domain of planning and carrying out investigations was at an average level with a mean of 1.70 and standard deviation of 0.042. The items

ranged between average and low levels with means ranging between 1.44 and 1.99. Item 10 came first in the rank, which states: "The teacher encourages students to implement what they have planned by identifying dependent and independent variables and controlling them during the experiment"; it has a mean of 1.99 and a standard deviation of 0.81; it is on average level. Item 12 came second, which states, "The teacher motivates students to plan and investigate and then determine what the teacher collects from the data"; it has a mean of 1.73 and a standard deviation of 1.04; it is on an average level. Item 11 came before the last rank, which states: "The teacher leads students to plan the investigation step by step. The students implement what guides them"; it has an average level of 1.64 and a standard deviation of 0.72; it is on a low level. Item 13 came last which states: "The teacher leads students to obtain results supported by evidence; it has a mean of 1.44 and standard deviation of 0.58, at a low level.

Using mathematics and computational thinking

Table 6 shows that the level of understanding of the classroom student teachers of scientific and engineering practices in light of the next generation of science standards for the items in the domain of using mathematics and computational thinking was at an

Table 5. Means, standard deviations and ranks for teacher students understanding of scientific and engineering practices in the domain of planning and carrying out investigations arranged in descending order.

S/N	Item	M	SD	Rank	Level
10	The teacher encourages students to implement what they have planned by identifying dependent and independent variables and how to control them during the experiment.	1.99	0.81	1	Average
12	The teacher motivates students to plan and investigate so that students ask questions and then determine how and what the teacher collects from the data.	1.73	1.04	2	Average
11	The teacher leads students to plan their inquiry step by step. And students implement what guides them	1.64	0.72	3	Low
13	The teacher leads students to reach evidence-based results	1.44	0.58	4	Low
	Planning and carrying out investigations	1.70	0.42		Average

Table 6. Means, standard deviations and ranks for teacher students understanding of scientific and engineering practices in the domain of Using mathematics and computational thinking in descending order.

S/N	Item	M	SD	Rank	Level
18	The teacher encourages students to use Mathematics and computational thinking using ICT	2.01	0.81	1	Average
19	The teacher encourages students to use mathematical skills (measurement, choosing appropriate units, converting units, calculating ratios, and percentages).	1.68	0.73	2	Average
20	The teacher encourages students to express the relationship between the variables in mathematical formulas. To help them predict and interpret	1.58	0.68	3	Low
21	The teacher urges students to use mathematical relationships to design programs with the help of technological programs and tools available to them.	1.55	0.65	4	Low
	Using mathematics and computational thinking	1.70	0.38		Average

average level; it has a mean of 1.70 and standard deviation of .038. The items ranged between low and average levels as the mean ranged between 1.55 and 2.01. Item 18 (The teacher encourages students to use Mathematics and computational thinking by using ICT) came in the first rank with a mean of 2.01 and standard deviation of 0.81. Item 19 was in the third rank, which states that 'The teacher encourages students to use mathematical skills (measurement, choosing appropriate units, converting units, calculating ratios, and percentages) with a mean of 1.68 and standard deviation of 0.73 at an average level. Furthermore, Item 20 provided that: "The teacher encourages students to express the relationship between variables in mathematical formulas that came in the penultimate rank with a mean of 1.58 and standard deviation of 0.68)at a low level. Finally, Item 21 provided that 'The teacher urges students to use mathematical relationships to design programs with the help of technological programs and tools available to them'; it has a mean of 1.55 and standard deviation of 0.65 at a low level.

Obtaining, evaluating, and communicating information

Table 7 shows that the level of understanding of the classroom student teachers of scientific and engineering practices in light of the next generation of science

standards for the items in the domain of obtaining, evaluating, and communicating information was at an average level with a mean of 1.69 and standard deviation of 0.38. The items ranged between low and average levels with mean ranging between 1.47 and .2.02. Item 26 provided that 'The teacher encourages students to read scientific article through books or to view the Internet to access scientific information'; it came in the first rank with a mean of 2.02 and standard deviation of 0.81 at an average level. This is fo;;owed by Item 28 which states that, 'The teacher urges students to display and share information with others in more than one way'; it has a mean of 1.72 and standard deviation of 0.76 at an average level.Item 30 was ranked next to the last, which states: "The teacher urges students to employ the best technology in the field of social networks as a source of obtaining information or offerring and exchanging knowledge" it has a mean of 1.57 and a standard deviation of 0.73, and at a low level. Item 29 provided that 'The teacher urges students to write scientific articles in a scientific way'; it came in the last rank, with a mean of 1.47 and standard deviation of 0.59, at a low level.

Constructing explanations (for science) and designing solutions (for engineering and engaging in argument from evidence

Table 8 shows that the level of understanding of the

Table 7. Means, Standard Deviations and ranks for teacher students understanding of scientific and engineering practices in the domain of Obtaining, evaluating, and communicating information in descending order.

S/N	Item	M	SD	Rank	Level
26	The teacher encourages students to read the scientific article through books or to view the Internet to access scientific information.	2.02	0.81	1	Average
28	The teacher urges students to display and share information with others in more than one way.	1.72	0.76	2	Average
27	The teacher urges students to use more than one source of information to obtain scientific information	1.65	0.72	3	Low
30	The teacher urges students to employ the best technology in the field of social networks as a source for obtaining information, presenting and sharing knowledge	1.57	0.73	4	Low
29	The teacher urges students to write scientific articles in a scientific way	1.47	0.59	5	Average
	Obtaining, evaluating, and communicating information	1.69	0.38		Average

Table 8. Means, Standard Deviations and ranks for teacher students understanding of scientific and engineering practices in the domain of Constructing explanations (for science) , designing solutions (for engineering) &Engaging in argument from evidence arranged in descending order.

S/N	Item	M	SD	Rank	Level
22	The teachers encourage students to interpret data and design solutions	1.66	0.77	1	Low
25	The teacher urges students to debate evidence by refuting and criticizing the scientifically unconvincing claim and accepting the scientifically convincing claim.	1.58	0.66	2	Low
23	The teacher encourages students to construct descriptive explanations. (Do not explain how or why this phenomenon occurred. Students do not use appropriate evidence to support the explanations)	1.51	0.69	3	Low
24	The teacher encourages students to interpret data supported by convincing scientific evidence.	1.51	0.67	3	Low
	Constructing explanations (for science) and designing solutions (for engineering)	1.56	0.41		Low

classroom student teachers of scientific and engineering practices in light of the next generation of science standards for the items in the domains of constructing explanations (for science) and designing solutions (for engineering and engaging in argument from evidence); it was at a low level with a mean of 1.56 and standard deviation of 0.41. All the items were at a low level as their means ranged between 1.51 and 1.66. Item 22 stated that 'The teachers encourage students to interpret data and design solutions'; it came in the first rank with a mean of 1.66 and standard deviation of 0.77, at a low level. Item 25 stated that 'The teacher urges students to debate evidence by refuting and criticizing scientifically unconvincing claim and accepting scientifically convincing claim'; it came in the second rank with a mean of 1.58 and standard deviation of 0.66, at a low level. Item 23 stated that 'The teacher encourages students to construct descriptive explanations, not to explain how or why a phenomenon occurs'. Item 24 states that, 'The teacher encourages students to interpret data supported by convincing scientific evidence'. Both items (23 and 24) came in the least rank within a low level as the mean for both of them was 1.51 with standard deviations of 0.69 and 0.67.

Developing and using models

Table 9 shows that the level of understanding of classroom student teachers of scientific and engineering practices in light of the next generation of science standards for the items in the domain of developing and using models was at a low level with a mean of 1.55 and standard deviation of 0.41. All the items were at a low level with means ranging between 1.50 and 1.64. Item 6 stated that 'The teacher encourages students to use models that illustrate the phenomenon through drawings or pictures; it came in the first rank with a mean of 1.64 and standard deviation of 0.77 at a low level. Item 9 provided that 'The teacher motivates students to evaluate the development of models to choose the best ones or to develop new models' it came in the second rank with a mean of 1.56 and standard deviation of 0.65 at a low level. Furthermore, Items 7 and 8 came in the last rank: iten 7 states that: 'The teacher encourages students to develop models that simulate reality and explain natural phenomena' and Item 8 states that 'The teacher encourages students to predict new phenomena or new characteristics of phenomena'; they have a mean of 1.50 and standard deviations of 0.69 and 0.67, at a low level.

Table 9. Means, Standard Deviations and ranks for teacher students understanding of scientific and engineering practices in the domain of Developing and using models arranged in descending order.

S/N	Item	M	SD	Rank	Level
6	The teacher encourages students to use models that illustrate the phenomenon through drawings or pictures	1.64	0.77	1	Low
9	The teacher motivates students to evaluate the development of models to choose the best ones or to develop new models	1.56	0.65	2	Low
5	The teacher encourages the building and use of models to understand the lesson.	1.54	0.65	3	Low
7	The teacher encourages students to develop models that simulate reality and explain natural phenomena	1.50	0.69	4	Low
8	The teacher encourages students to predict new phenomena or new characteristics of a phenomenon.	1.50	0.67	4	Low
	Developing and using models	1.55	0.41		Low

Analyzing and interpreting data

Table 10 shows that the level of understanding of the classroom student teachers of scientific and engineering practices in light of the next generation of science standards for the items in the domain of analyzing and interpreting data was at a low level with a mean of 1.45 and standard deviation of 0.36. Item 17 provided that 'The teacher leads students to obtain accurate results (validity and reliability)'; it came in the first rank with a mean of 1.59 and standard deviation of 0.66 at a low level. This is followed by Item 14, which provided that 'The teacher encourages students to collect and analyze data. And organize them in tables or graphs'; it has a mean of 1.53 and standard deviation of 0.73, at a low level. Item 16 provided that 'The teacher urges students to explain the relationship between the variables (causal and associative)' ; it has a mean of 1.36 and standard deviation of 0.56, at a low level. Finally, Item 15 provided that 'The teacher encourages students to choose appropriate methods of presenting data and clarifying relationships between them' ; it has a mean of 1.32 and standard deviation of 0.57, at a low level

Results of the second question: What is the effect of the studying year level in the evaluations of the first three grades classroom teachers' knowledge of scientific and engineering practices according to NGSS standards?

To answer this question, means and standard deviations for the evaluations of the samples for the first three grades of classroom teachers' knowledge degree of scientific and engineering practices were calculated according to NGSS standards and the study year. Table 11 shows that there are apparent differences between the means of the samples' evaluations for the first three grade classroom teachers' knowledge of scientific and engineering practices according to NGSS standards and

the study year; fourth year category had the highest mean (2.02) while second year category came in the second rank (1.61); finally, third year category had a mean of 1.56. To determine the significance of the differences at the level of α =0.05, one Way ANOVA was used as shown in Table 12.

The results in Table 12 indicate the presence of statistically significant differences at the level of α = 0.05 in the estimates of the individuals of the research sample; it shows the levels of the female student teachers' knowledge of scientific and engineering practices in light of the next generation of science standards NGSS according to the variable of the school year. Based on the value of P calculated, it reached 8,614, and its level of significance was 0,000. There were statistically significant differences in most fields. The calculated values of P ranged between 11.957 and 5.673, while there were no statistically significant differences in the field of data analysis and its interpretation. From the calculated value of P it amounted to 2.343; the level of significance was 0.075. Differences exist in the overall levels of their knowledge. The areas in which the differences occurred were also determined. *Scheffe* test was applied for the dimensional comparisons. Table 13 shows the results. Table 13 shows that the differences were in favor of the fourth year category when compared with the rest of the categories (third, second and first), in the overall degree, and all the areas in which the differences occurred .

DISCUSSION

The results of the study indicated that there is a level of pre-service female student teachers' understanding of scientific and engineering practices in light of the next generation of NGSS science standards; it was both medium and low. This general result is due to the fact that scientific and engineering practices and their indicators are the bases of the teaching process and studying of scientific subjects in the university. The result

Table 10. Means, Standard Deviations and ranks for teacher students understanding of scientific and engineering practices in the domain of analyzing and interpreting data arranged in descending order.

S/N	Item	M	SD	Rank	Level
17	The teacher leads students to obtain accurate results (validity and reliability)	1.59	0.66	1	Low
14	The teacher encourages students to collect and analyze data and organize them in tables or graphs	1.53	0.73	2	Low
16	The teacher urges students to explain the relationship between the variables (causal and associative)	1.36	0.56	3	Low
15	The teacher encourages students to choose appropriate methods of presenting data and clarifying relationships between them	1.32	0.57	4	Low
	analyzing and interpreting data	1.45	0.36		Low

Table 11. means and standard deviations for the evaluations of the samples for the first three grades classroom teachers' knowledge degree of scientific and engineering practices according to NGSS standards and the study year.

Practice	Year	No	M	SD
Asking questions and defining problems	First	34	1.67	0.306
	Second	42	1.69	0.370
	Third	63	1.66	0.415
	Fourth	15	2.12	0.208
	Total	154	1.72	0.385
Planning and carrying out investigations	First	34	1.40	0.274
	Second	42	1.52	0.377
	Third	63	1.53	0.427
	Fourth	15	2.03	0.291
	Total	154	1.55	0.405
Using mathematics and computational thinking	First	34	1.73	0.505
	Second	42	1.68	0.367
	Third	63	1.62	0.376
	Fourth	15	2.08	0.278
	Total	154	1.70	0.416
Obtaining, evaluating, and communicating information	First	34	1.42	0.312
	Second	42	1.46	0.307
	Third	63	1.40	0.405
	Fourth	15	1.67	0.336
	Total	154	1.45	0.359
Constructing explanations (for science) and designing solutions (for engineering) and engaging in argument from evidence	First	34	1.66	0.307
	Second	42	1.69	0.370
	Third	63	1.65	0.402
	Fourth	15	2.08	0.244
	Total	154	1.70	0.379
Developing and using models	First	34	1.46	0.298
	Second	42	1.52	0.380
	Third	63	1.53	0.408
	Fourth	15	2.10	0.296
	Total	154	1.56	0.406

Table 11. Contd.

	First	34	1.70	0.366
	Second	42	1.71	0.340
Analyzing and interpreting data	Third	63	1.58	0.378
	Fourth	15	2.03	0.301
	Total	154	1.69	0.377
	First	34	1.57	0.277
	Second	42	1.61	0.325
Total Degree	Third	63	1.56	0.351
	Fourth	15	2.02	0.228
	Total	154	1.62	0.341

Table 12. MANOVA of samples' evaluations for the first three grades classroom teachers' knowledge degree of scientific and engineering practices according to NGSS standards and the study year.

Variance	Proactive	Squares	Freedom	M	F	Sig
	Asking questions and defining problems	2.689	3	0.896	6.723	0.000*
	Developing and using models	4.237	3	1.412	10.183	0.000*
	Planning and carrying out investigations	2.703	3	0.901	5.673	0.001*
	Analyzing and interpreting data	.883	3	0.294	2.343	0.075
Year	Using mathematics and computational thinking	2.433	3	0.811	6.220	0.001*
	Obtaining, evaluating, and communicating information	4.879	3	1.626	11.957	0.000*
	Constructing explanations (for science) and designing solutions (for engineering) and engaging in argument from evidence	2.466	3	0.822	6.386	0.000*
Total			3		8.614	0.000*
	Asking questions and defining problems	0.873	150	0.133	8.614	0.000*
	Developing and using models	0.133	150			
	Planning and carrying out investigations	0.139	150			
Error	Analyzing and interpreting data	0.159	150			
	Using mathematics and computational thinking	0.126	150			
	Obtaining, evaluating, and communicating information	0.130	150			
	Constructing explanations (for science) and designing solutions (for engineering)	0.136	150			
Total		0.129	150			0.101
	Asking questions and defining problems	22.689	153			
	Developing and using models	25.041	153			
	Planning and carrying out investigations	26.527	153			
Total degree	Analyzing and interpreting data	19.720	153			
	Using mathematics and computational thinking	21.987	153			
	Obtaining, evaluating, and communicating information	25.281	153			
	Constructing explanations (for science) and designing solutions (for engineering)	21.774	153			

shows plans should be made to prepare the female students. The students should use 15 h to study five subjects, and be taught how to study them such as chemical concepts, biology, environmental education, engineering concepts, the structure of preparation. Also, the background of the female students in high school should also be considered when preparing them. The result shows that in a non-scientific nation, building

Table 13. Scheffe test for the differences samples' evaluations for the first three grades classroom teachers' knowledge degree of scientific and engineering practices according to NGSS standards and the study year.

Practice	Year	M	4th	2nd	1st	3rd
			2.12	1.69	1.67	1.66
Asking questions and defining problems	4th	2.12	-	*0.43	*0.45	*0.46
	2nd	1.69		-	0.02	0.03
	1st	1.67			-	0.01
	3rd	1.66				-
	Year	M	4th	2nd	1st	3rd
			2.03	1.53	1.52	1.40
Developing and using models	4th	2.03	-	*0.50	*0.51	*0.63
	2nd	1.53		-	0.01	0.13
	1st	1.52			-	0.12
	3rd	1.40				-
	Year	M	4th	2nd	1st	3rd
			2.08	1.73	1.68	1.62
Planning and carrying out investigations	4th	2.08	-	*0.35	*0.40	*0.46
	2nd	1.73		-	0.05	0.11
	1st	1.68			-	0.06
	3rd	1.62				-
	Year	M	4th	2nd	1st	3rd
			2.08	1.69	1.66	1.65
Using mathematics and computational thinking	4th	2.08	-	*0.39	*0.42	*0.43
	2nd	1.69		-	0.03	0.04
	1st	1.66			-	0.01
	3rd	1.65				-
	Year	M	4th	2nd	1st	3rd
			2.10	1.53	1.52	1.46
Constructing explanations (for science) and designing solutions (for engineering and Engaging in argument from evidence	4th	2.10	-	*0.57	*0.58	*0.64
	2nd	1.53		-	0.01	0.07
	1st	1.52			-	0.06
	3rd	1.46				-
	Year	M	4th	2nd	1st	3rd
			2.03	1.71	1.70	1.58
Obtaining, evaluating, and communicating information	4th	2.03	-	*0.32	*0.33	*0.45
	2nd	1.71		-	0.01	0.13
	1st	1.70			-	0.12
	3rd	1.58				-
	Year	M	4th	2nd	1st	3rd
			2.02	1.61	1.57	1.56
Total	4th	2.02	-	*0.41	*0.45	*0.46
	2nd	1.61		-	0.04	0.05
	1st	1.57			-	0.01
	3rd	1.56				-

Sig at : 00.05.

interpretations and designing solutions, the field of developing and using forms, the field of data analysis and interpretation came low. This result can also be attributed to the fact that female students 'practice of scientific and engineering needs a long time; and it is not commensurate with the high numbers of students enrolled for one course because the university's science lab is not ready for them.This finding is consistent with that of Harris et al. (2017).

It can be explained by the fact that female students in the fourth year receive a better estimate in understanding scientific and engineering practices, that all students postpone the scientific courses to the fourth year due to fear and as a way of escaping from studying these courses. There is a negative trend towards scientific subjects, which necessitates the need of working to modify the scientific trends of female students who are pre-service teachers and will teach scientific subjects after graduation.

Recommendatıons

(i) Reconsidering the academic plans for the baccalaureate stage for students who want to be class teachers
(ii) Giving attention to the indicators of scientific and engineering practices that showed the results of the research are weak in its ownership and taken as an introduction to teaching scientific courses at the university.
(iii) There is need to employ practical teaching during the training of female students in practical education; the time of the practical education course should be 9 h per three courses in order to train female teachers to employ scientific and engineering practices in the light of NGSS.
(iv) There is need for the university to speed up the preparation of the science selector to teach scientific courses in the laboratory in order to modify the scientific trends of female students.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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A path analysis model examining self-concept and motivation pertinent to undergraduate academic performance: A case of Kenyan public universities

Joyce Chepkirui and Weihai Huang*

School of Public Administration, Nanjing Agricultural University, Nanjing 210095, China.

The academic performance of undergraduates is as a result of several factors involving student- and school-level characteristics. Understanding the effect of these factors is beneficial to both students and the entire institution. The current study examines the relationship between the independent variable (self-concept) and dependent variable (student academic performance) through a proposed mediator (motivation). Correlation design, multiple regression and mediation analysis were employed as the procedures of analyzing our data. The study sample comprises 365 final-year students drawn from arts and science faculties in selected universities based in Kenya. Correlation output revealed that academic performance positively correlated with motivation ($r=0.333$, $P<0.01$). Further composite regression analysis revealed a significant influence of motivation ($\beta = 0.97$, $P<0.001$) on academic performance. Mediation analysis identified indirect-only mediation ($a \times b = 0.049$, $P < 0.01$). Both Sobel z-test and bootstrap results indicated a significant indirect effect $a \times b$ while the direct effect C is not significant, thus signaling the presence of indirect-only mediation. Generally, motivation has a mediating role ($\beta = 0.311$, $r = 0.333$) in relation to self-confidence and academic performance. These results imply that students' levels of motivation and self-concept are vital to enhance academic performance.

Key words: Academic performance, mediation, path analysis, self-concept, motivation.

INTRODUCTION

Higher education plays a significant role in building a robust society, ending poverty and enhancing economic prosperity. It imparts knowledge and skills to the graduates who will soon become sources of the labor force to drive economic growth. Economics research provides evidence that there is a positive relationship between education and a country's economics (Barro,

2013; Hanushek and Woessmann, 2008, 2012). Although the existing literature points out that it is quite challenging to identify the direct contribution of higher education in growth, this research shows that countries with tremendous graduates have experienced increased labor productivity and easily adjust to technological changes and innovation (Bloom et al., 2014). Performance in

*Corresponding author. E-mail: huangweihai@njau.edu.cn.

learning activities is commonly evaluated by multiple scores a student receives at various educational levels. Every institution and the individual learner must recognize factors that contribute positively to their academic performance to improve it. Student's academic performance is influenced by factors such as socioeconomic background, student attitude and interest in learning. In line with this, in-class behavior, self-concept and motivation stand out to be the most substantial factors contributing to academic performance in primary and high school (Yeung et al., 2011; Green et al., 2012; Vogl and Preckel, 2014; Méndez-Giménez et al., 2017). Students desiring for higher achievement are expected to have positive classroom setting behaviour, a higher degree of self-concept and motivation. Therefore, this study was conducted to investigate if a similar pattern can be observed in Kenyan universities.

Self-concept is a widely studied component that affects performance in the workplace and academia. It is the individual cognition, beliefs and view of oneself to instructional activities (Tang, 2011). Academic self-concept heightens with consistent academic success or failures over a specific span, especially at the initial stages of life. Higher performance at the early stages results in a higher degree of self-concept and eventually improved performance. On the one hand, low performance at the childhood stage increases the occurrence of low performance damaging self-concept and decreasing self-confidence (Marsh and Craven, 2006), which requires attention to change. Yara (2010) investigated the effect of self-concept on some high school students' mathematics achievement in southwestern Nigeria and found that students with positive self-concept excel in mathematics. Some studies obtained no significant relationship between self-concept and academic performance (Yahaya and Ramli, 2009; Naderi et al., 2009) while other studies revealed a meaningful relationship between self-concept and academic performance (Hau et al., 2000; Peralta-Sánchez and Sánchez-Roda, 2003; Valentine et al., 2004; Marsh et al., 2005; Nuthana and Yenagi, 2009; Aryana, 2010).

Self-efficacy is one of the psychological components related to self-concept. Perceived self-efficacy refers to people's beliefs in their capabilities to produce given achievements. As by Kolbe and Bruske (2017) study, individuals with high self-efficacy effectively strategize on completing a given task. From the literature, self-efficacy has a higher predictability value of performance outcomes in various subjects. Students with positive self-efficacy are eager to understand a lesson, provide a solution to learning challenges and stick to challenging courses (Manzano et al., 2018). Compared to students with low self-efficacy, students with better self-efficacy study complex subjects later, work on challenging tasks, remain focused, spend more effort learning and record superior academic performance (Azar, 2010).

Motivation is another critical component in learning, which refers to an individual's desire and incentive to engage in a specific task (Loewen and Reinders, 2011). According to Bukari and Abra (2017), motivation means students' effort towards improving their performance. It drives peoples towards their wishes to reach their needs. It empowers one to learn. Unmotivated individuals do not act accordingly and thus experience trouble in achieving their desired goal (Demir and Budak, 2016). Students' disengagement during lectures leads to social problems and imprecise work. Moreover, less motivated students are disengaged in learning, get bored and lose determination. A study by Arbabisarjou et al. (2016) involving medical students observed a significant relationship between achievement motivation and academic performance. Liu and Hou (2017) conducted a longitudinal survey and their result indicated that intrinsic motivation significantly contributed to academic performance. Various studies have also uncovered that achievement motivation is positively related to academic performance (Awan et al., 2011; Amrai et al., 2011; Izuchi and Onyekuru, 2017).

Although studies have evidenced that these related academic factors play a primary role in academic performance, their relations vary according to the type of learning institution, subjects/courses, students' characteristics, family background, or even country-level factors. Composite multiple regression has been suggested to determine the multivariate relationships (Kusurkar et al., 2013; Keith, 2014). Structural equation modelling (SEM) provides an extension to multiple regressions, particularly when involving many variables to produce path analysis. Various relationships that could be either direct or indirect can be shown in a path diagram and their causal effect will be indicated by the regression weight, β (Hair et al., 2006). A single-headed arrow highlights the cause for independent, intervening and dependent variables while a bidirectional hand signals the covariance between the two variables. An intervening variable can justify an extant relationship between the explanatory and dependent variables.

Kenya's higher education landscape has changed significantly from independence (1963) to date, resulting in an increased number of universities and graduates to drive the country's economic competitiveness. However, higher education in Kenya is faced with numerous critical issues including, access, quality, and affordability (Kagondu, 2015; Malechwanzi et al., 2016), lack of relevant instructional materials, equipment, and teaching force (Kagondu, 2015), inadequate funding, and under-representation of girls in science and mathematics where boys dominate (Wasanga et al., 2011). The Kenyan government has tried to boost higher education financing and attain gender equality in terms of enrollment by initiating programs such as Free Primary Education (FPE). Despite reforms to expand university education in Kenya, a lot is needed to improve student teaching

and learning. Limited higher education studies have investigated variation in individual skills and education achievement originating from students' and schools' characteristics. As a result, this research intends to evaluate factors impacting academic performance to address gender gaps in Kenya's higher educational attainment. The researcher hypothesized that self-concept affects students' academic performance, mediated by motivation. The study research objectives are as follows:

(1) To determine the influence of self-concept and motivation on academic performance.
(2) To determine motivation mediation effect of self-concept on academic performance.

METHODOLOGY

The study adopted a descriptive survey research design where quantitative methods explain the relationship between academic performance factors. The sample mainly comprised final fourth-year undergraduate students who are in the school of arts and science. The participants also involved third-year students for Diploma programs and fifth-year students for engineering programs. These participants involved undergraduate students of Egerton University, University of Kabianga, Laikipia University and Chuka University drawn from main campuses in Kenya. The respondents for the study were mainly selected from Arts and Science faculties. At the first stage, one or more undergraduate programs were selected from each faculty member in all selected universities to form arts and science strata. Consequently, from the willing students studying Bachelor of Science and Bachelor of Arts, 100 volunteers' final-year students were randomly selected in each university comprising 50 from Bachelor of Science and 50 from Bachelor of Arts. The sample size of 100 students from each of the four universities participated in the study, making up 400 respondents. The questionnaire was chosen as an instrument for collecting data on factors influencing undergraduate students' academic performance. Section A of the questionnaire covered demographic characteristics, while section B consisted of educational elements rated on a Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). Both primary and secondary data were important in explaining the findings of our study.

The reliability of the research instrument was mainly achieved through Cronbach's Alpha method. To determine the research instrument's reliability and attain the study objectives, a pilot study was conducted in the Department of Agriculture, Egerton University, where 100 participants were drawn considering gender balance. Responses from the selected participants were ranked to determine their relationships. The Cronbach Alpha reliability coefficient for the questionnaire was found to be 0.817, which according to Gamble (2018), was above the threshold of 0.7. Hence, it is considered excellent and that the research instrument was a reliable measure for this study. A letter of introduction from the School of Economics and Management, Nanjing Agricultural University was issued after that permission was sought from National Council for Science and Technology, Kenya. Authorization was inquired from the deputy vice-chancellors of academic affairs before conducting the main study. Consent was sought from the respondents before administering the questionnaires and assured that their responses were confidential. The questionnaires were distributed during one of the lectures and assembled within an interval of two weeks, specifically during one of the course session. Participation was voluntary and none of the incentives or any other form of reinforcement was offered to the respondents which motivated

them to contribute to the study. Independent variables consisted of self-concept and motivation and the dependent variable is academic performance. The relationship between independent variables and dependent variables via intermediate variables is illustrated in Figure 1. Data were analyzed through inferential statistics and PROCESS macro in SPSS version 26, which allows the analysis of the mediating role of the variables. Analyses were performed through bootstrapping with 5000 samples at a 95% confidence level. Mediation results were further confirmed via the Sobel z-test in the following.

Mediation analysis

The predictive effect of self-confidence on academic performance was analyzed by a mediational analysis. Figure 1 is a simple model showing path a, b, and c, where self-concept is hypothesized to affect performance, mediated by student's motivation.
The following equations guided paths a, b and c in the aforementioned model.

$$M = i_1 + aX + e_1. \tag{1}$$

$$Y = i_2 + c'X + e_2. \tag{2}$$

$$Y = i_3 + cX + bM + e_3. \tag{3}$$

A mediation analysis was employed to test for the mediating effect of motivation in relation to self-concept and academic performance. Baron and Kenny (1986) recommended step by step procedure of performing mediation analysis. Mediation is only possible if these conditions are followed through regression analysis. The first condition needs a demonstration that independent variable influenced mediator (Equation 1). The second condition must satisfy that the independent variable affects the dependent variable (equation two) and finally, the mediator must have an impact on the dependent variable demonstrated in Equation 3. Mediation is firmly supported when the relationship between the mediator and dependent variable is altered after accounting for the effect of the mediator variable on the dependent variable. Further, they argued that there is a need to establish a significant zero-order effect of the independent variable X on the dependent variable Y in mediation. Still, their perception was somehow incorrect since establishing mediation does not necessarily require a significant zero-order effect of X on Y. This is because the Zero-order effect of X on Y is equal to the total effect of X on Y or the sum of the indirect path $a \times b$ and direct path c as follows:

$$c' = (a \times b) + c$$

To test for the indirect path $a \times b$, Barron and Kenny suggested the Sobel z-test as illustrated in Equation 4:

$$z = \frac{a \times b}{\sqrt{b^2 s_a^2 + a^2 s_b^2}} \tag{4}$$

Later Zhao et al. (2010) disputed the three conditions stated earlier, appealing that, firstly, the strongest mediation is highly evident when there is an indirect effect but without any direct effect. However, the strength of the mediation is determined by the level of indirect effect and not by the absence of the direct effect. The presence of direct effect means that other mediators are hypothesized. Secondly, to establish mediation, indirect effect $a \times b$ should be significant, and lastly, the Sobel z-test is perceived less
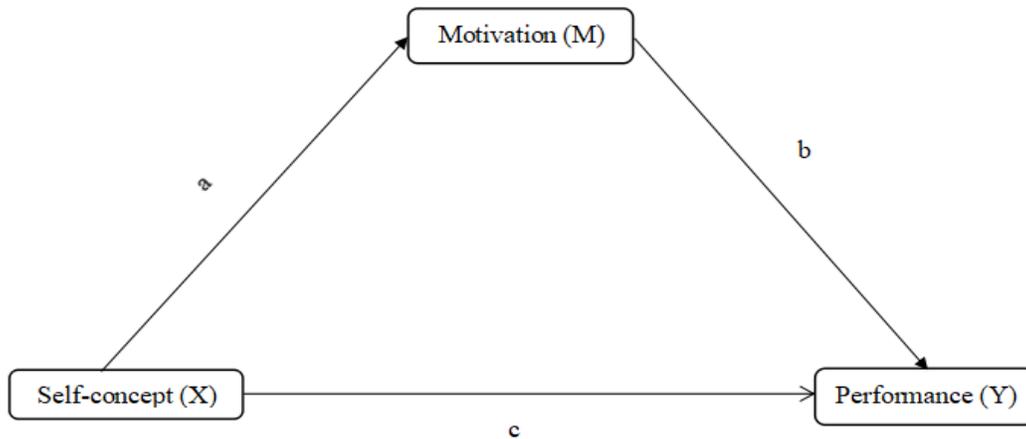
Figure 1. Simple Model showing path a, b and c.

Table 1. Pearson correlation of factors influencing student academic performance.

Correlation	Self-concept	Motivation	Academic performance
Self-concept	1	0.181**	0.093
Motivation		1	0.333**
Academic performance			1

, *, denote significant at the 0.01 and 0.001, respectively.

Table 2. Model summary.

Model	R	R^2	Adjusted R^2	Std. Error of the estimate
1	0.335	0.112	0.107	0.35166

superior than the bootstrap test introduced by Preacher and Hayes (2004). Hence, both the Sobel z-test and bootstrap test were performed to confirm the mediating effect.

RESULTS

Table 1 shows that academic performance significantly correlated only with motivation variable (r = 0.333, $P <$ 0.01), meanwhile self-concept correlated with motivation (r = 0.181, $P = 0.01$).

The regression output examines how much of the total variance in students' academic performance will be explained by the path model's study variables. The output indicates that the independent variables and dependent variables' relationship was 0.335, while the coefficient of determination (R^2) was 0.112. According to regression analysis, 11.2% of the variation in student's academic performance is accounted for by self-concept and motivation (Table 2).

Composite regression analysis indicated highly significant positive influence of motivation on student's academic performance (β = 0.197, $P <$ 0.001; Table 3). Self-concept had no significant relationship with academic performance, while motivation contributed directly to academic performance.

Next, the mediation effect was examined. Figure 2 illustrates the standardized coefficients and their respective standard errors as well as the significance level of each variable regarding self-concept, motivation and academic performance.

Mediation was first verified by evaluating the three regression equation, as stated earlier. Mediation is classified into competitive, complementary, and indirect-only mediation (Zhao et al., 2010). The present model identified indirect-only mediation, which overlaps with full mediation by Baron and Kenny. Both Sobel z-test and bootstrap results indicated a significant indirect effect (a ×b = 0.049, P < 0.01) while the direct effect C is not significant, thus signaling the presence of indirect-only mediation. Motivation (β = 0.197, P < 0.001) mediated the effect of self-concept on academic performance. In summary, the present model provides evidence for the

Table 3. Multiple regression of self-concept and motivation.

Variable	Unstandardized coefficients		Standardized coefficients	T
	B	Std. error	Beta	
Constant	1.740	.160		10.866
Self-concept	0.028	0.041	0.034	0.687
Motivation	0.197***	0.030	0.327	6.593

Dependent variable: academic performance, ***significant at 0.001.
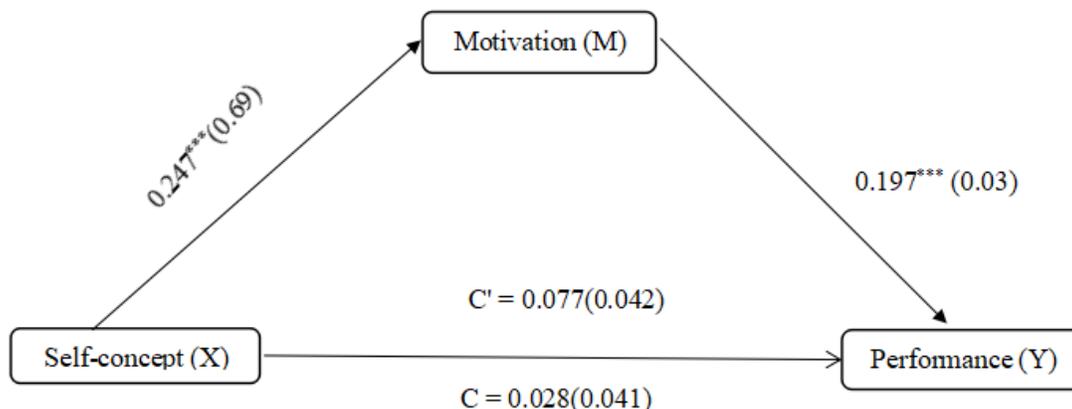
Figure 2. Final path analysis of three factors model showing path coefficients (p) and standard errors (in brackets). C' represents the total effect.

presence of both hypothesized and the unlikelihood of an omitted mediator. This implies that the mediator is identified and is consistent with the hypothesized theoretical framework.

DISCUSSION

This study aimed to analyze the relationship between the independent variable (self-concept) and independent variable (academic performance) by assessing the possible mediating role of the motivation factor. The results of this study showed that academic performance is positively correlated to motivation (r = 0.333, $P < 0.01$), meanwhile self-concept correlated with motivation (r = 0.181, $P < 0.01$) (Table 1). Moreover, regression output shows strong significant positive influence of motivation on student's academic performance ($\beta = 0.97$, $P < 0.001$) (Table 3). The aforementioned data revealed that motivation, as a factor, strongly contributed to students' academic performance. A mediation analysis was further conducted to test the relationship between independent and dependent variables through the mediator. Both the Sobel z-test and a newly recommended bootstrap test method presented by Preacher and Hayes (2004) were employed. Using the two approaches, the present model revealed similar result leading to a significant indirect-only mediation ($a \times b = 0.049$, P < 0.01), meanwhile, both the direct effect C (0.028) and total effect C' (0.077) were not significant.

Based on Baron and Kenny's opinions, the first step before conducting mediation analysis is establishing a significant zero-order effect of the independent variable on a dependent variable. According to Zhao et al. (2010), their idea was incorrect because the zero-order effect is equal to the total effect. Baron and Kenny (1986) proposed three conditions to be considered in establishing mediation; first, the independent variable must affect the mediator. Second, the independent variable must affect the dependent variable and, lastly, the mediator is required to bear an effect on the dependent variable. This is contrary to Zhao et al. (2010), who argued that mediation is only established when there is a significant indirect effect but without direct effect. Findings of the present study met two of Baron and Kenny's (1986) conditions; self-concept directly affects motivation, and motivation influenced performance. Importantly, there was a significant indirect effect suggested by Zhao et al. (2010), thus signifying the mediating role of motivation.

Baron and Kenny (1986) classified mediation into three types full, partial and no mediation, which was later

reviewed by Zhao and categorized as indirect only mediation, complementary, competitive, and non-mediation. Where the direct effect C is significant and the product $a \times b \times c$ is positive, there is evidence of complementary mediation. However, when the direct effect C is significant but the result of the product of $a \times b \times c$ is not positive, we have a competitive type of mediation. In both cases, the data supports a hypothesized mediation and the significant direct effect C shows the possibility of some omitted mediator. This suggests that a mediator is identified, which corresponds to the hypothesized theoretical framework considering the likelihood of an omitted mediator in the direct effect. Our findings show the significant indirect effect $a \times b$ while the direct effect C is not significant, thus signaling the presence of indirect-only mediation, and it is unlikely that the mediator has been omitted.

The study findings show that self-concept positively influences motivation and that academic performance is also positively predicted indirectly by self-concept through motivation. These results fall in line with studies of Awan et al. (2011), reporting that positive self-concept contributes to academic performance by increasing motivation to achieve. Further, the present finding agrees with other study findings that noted a significant and positive relationship between academic self-concept and performance (Yara, 2010; Liu, 2010; Tang, 2011; Lawrence and Vimala, 2013; Sikhwari, 2014; Izuchi and Onyekuru, 2017). This could be due to the perception that academic motivation results in an excellent performance, which instills self-confidence among students to achieve success in learning. While several studies obtained a significant positive relationship between self-concept, motivation and academic performance, other studies have reported differing results; some have reported a negative or moderate correlation among these variables (Naderi et al., 2009; Yahaya and Ramli, 2009; Othman and Leng, 2011). Current findings reinforced that self-concept and motivation predict students' achievement in universities.

Students' constant success results in a higher degree of self-confidence that increases motivation for a better performance later. Kim and Sax (2014) claimed that academic self-concept is a highly valued college student outcome because of its perceived effect on academic performance. This variable is influenced by a host of demographic factors such as gender, age and race (Cokley, 2000; Prince and Nurius, 2014). Various studies have shown that self-concept has either a direct or indirect effect on a wide range of learning outcomes (Liu et al., 2009; Marsh and O'Mara, 2008; Valentine et al., 2004; Wouters et al., 2011). Several scholars consent to the idea that self-concept is a critical subject that determines relationships, performances, and achievements either positively or negatively. Individual success or failure likely depends on personal knowledge about oneself measured by mental capacity. It may be influenced by comparing ourselves with the individuals surrounding us and others' judgment towards us. Individuals with favourable self-concept quickly develop internal motivation, which improves their performance.

It is clear from the present finding that motivation played a mediating role between self-confidence and academic performance. This result corresponds to those of Areepattamannil (2012) and Guay et al. (2010), who established that intrinsic motivation mediated the relationship between academic self-concept and academic performance. Furthermore, Liu and Hou (2017) hold that motivation is significantly associated with academic performance. Several other studies done by various scholars have also reported similar findings (Awan et al., 2011; Arbabisarjou et al., 2016; Amrai et al., 2011). Korantwi-Barimah et al. (2017) also obtained a significant positive correlation between self-concept, motivation and academic performance. It is believed that students who consider themselves academically able to earn good grades because their self-concept drives them more to academic excellence. Motivation has also been essential in contributing to a broad range of academic factors indirectly linked to academic performance. For instance, students who highly valued school, including the low achievers, recorded a higher degree of motivation and were actively engaged in a classroom setting at the final stage of their tenth grade (Crumpton and Gregory, 2011). Among students in various educational levels, motivation not only contributes to their academic success but more interest in learning and a solution to their multiple obstacles (Bui, 2002; Cavazos et al., 2010). Students who are internally stirred display positive behaviors such as being attentive, concentrating, and participating in class activities. They also avoid misconduct, such as absenteeism, early dropout, and disengagement, which usually diminishes their academic excellence chances. Among the freshers nursing students, a higher degree of motivation greatly influenced the importance attached to their courses related to their future goals and their general development (Simons et al., 2004; Trevino and DeFreitas, 2014). These students are quickly adapted to cognitive approaches, improved study habits and persisted throughout their studies strongly related to intrinsic motivation.

Motivation drives and directs people into actions; hence there is a powerful association between learning and motivation. Highly motivated individuals are willing to engage in their learning activities towards their future goals, strive to take more challenging tasks, have a better mastery of the concept, and develop learning strategies that contribute to their greater performance, as indicated in present findings.

CONCLUSION AND IMPLICATIONS

Regarding these study finding, it was concluded that,

first, academic performance is positively correlated with motivation. Second, motivation mediated the effect of self-concept on academic performance. Therefore, it is essential for the university and educators to cultivate a free and supportive learning atmosphere that promotes the formation and development of self-motivation that boost learning engagement, enhance self-concept, lessen attrition, and eventually improve students' performance. All these factors should be reinforced in schools, homes and society, in general, to improve academic excellence in universities and contribute to the country's economic growth. Despite the significance made by this study, there were few limitations. First, the study sample involved only final year students at their undergraduate level; subsequent studies should consider representatives from other educational levels. Second, the study was mainly conducted in major public universities in Kenya; hence future research should consider private universities to determine whether similar results will be replicated.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Examination of prospective psychological counselors' therapeutic alliance skills with their attachment styles and self-regulation skills

Kandemir Mehmet

Department of Psychological Counseling, Faculty of Education, Kirikkale University, Turkey.

This study aimed to examine the relationship between the therapeutic alliance developed by prospective psychological counselors with clients in their psychological counseling practices and their attachment styles and self-regulation skills. The study used a correlational survey model and was carried out on 460 prospective psychological counselors. Data were collected using the Psychological Counseling Form of the Therapeutic Alliance Scale, the Interpersonal Attachment Styles Scale, and the Self-Regulation Dimension of the Emotional Literacy Scale. After the normality analyses, the data collected in the study were analyzed with hierarchical regression. It was found that the attachment styles involved in the regression model in the first stage to predict the therapeutic alliance skills of psychological counselors had a significant contribution to the model (R = 0.42, R2 = 0.21, p<0.01). It was found that avoidant attachment style predicted therapeutic alliance more strongly than other attachment styles but that this predictive effect was negative (β= -0.30, t = 7.50, p<0.01). The self-regulation skill involved in the model in the second stage of the regression analysis had a significant contribution to the model (R = 0.43, R2 = 0.22, p<0.01). In addition, it was found that self- regulation skills positively predicted therapeutic alliance (β = 0.17, t = 3.17, p<0.05). According to the results of the study, it was found that awareness studies about attachment styles and self-regulation in the education of prospective psychological counselors affected their therapeutic alliance skills.

Key words: Therapeutic alliance, attachment styles, self-regulation, prospective psychological counselors, hierarchical regression.

INTRODUCTION

In the profession of psychological counseling, the nature and quality of the relationship between the counselor and the client has attracted the attention of researchers and theorists in every period. This interest has become the main research topic of especially process-outcome researchers who have tried to determine the methods, approaches, and variables that make significant contributions to the change of the client (Whiston and Sexton, 1993). According to Lambert et al. (2004), in these studies, practitioners were provided with evidence-based information to increase the effectiveness of the therapeutic process. While outcome research investigates

E-mail: mkandemir.tr@gmail.com.

the momentary or permanent changes in the field of psychological counseling (counseling, therapy) emerging as a result of the psychological counseling and psychotherapy process, process studies focus on factors that are effective in counseling or psychotherapy sessions (Hill and Lambert, 2004).

In recent years, the interest of process-outcome researchers has focused on common factors affecting psychological counseling behaviors (Barber et al., 2000; Martin et al., 2000). According to the common factors approach, the basic principles and methods of psychological counseling theories have an effect similar to the well-being of the client when applied in the counseling process (Wampold, 2010). Shadish and Baldwin (2002) similarly stated that there was very limited evidence to support the superiority of any counseling approach over any other counseling approach. In this context, meta-analysis studies conducted by Lambert (1992) and Wampold (2001) pioneered the above-mentioned explanations. In the common factors meta-analysis study developed by Lambert (1992), factors affecting the results of the psychological counseling process were determined as four factors, namely, client factor, therapeutic relationship factor, therapeutic model or approach factor, and positive expectation (hope)/placebo factor. It was revealed that the social support perceived by the client and the client factors covering the experiences of the client affected the client's motivation, desire for change, and problem-solving resources by 40%, the therapeutic relationship factor including the quality of therapeutic relationship affected therapeutic alliance by 30%, and that the approach factor including the therapeutic principles and methods and the expectation factor that included the positive belief that the problem would be solved affected the counseling outcomes by 15% each (Lambert, 1992). The results of the meta-analysis study conducted by Wampold (2001) and Cuijpers et al. (2019) were found to support the meta-analysis results of the study conducted by Lambert.

Wampold (2001) stated that the most important part of common factors was the therapeutic alliance between the client and the counselor. Similarly, Wexler (2006) stated that therapeutic alliance, which is among the common factors that are known to strongly affect the well-being of clients, became the focal point. Known as part of a therapeutic relationship, the therapeutic alliance (Barber et al., 2000; Horvath and Luborsky, 1993) is defined as an understanding between the client and the psychological counselor about the goals of development and the tasks that must be fulfilled to achieve these goals (Bordin, 1979). Bordin (1979) thought that the therapeutic alliance consisted of three interrelated and integral components: goals, tasks, and emotional bonds. The collaboration established by developing an alliance between the counselor and the client about the aims of the psychological counseling process constitutes the goal component of the alliance. The collaboration established

by developing an alliance by the counselor and the client about the necessary tasks and responsibilities to reach the goals of the counseling constitutes the task component of the alliance. The formation of a trust bond between the psychological counselor and the client by developing respect and acceptance in the psychological counselor and the client relationship constitutes the emotional bond component (Bordin, 1994). Significant research findings regarding the effect of the therapeutic alliance on the psychological help process have been reached in literature (Buchholz and Abramowitz, 2020; Gobin and Freyd, 2009; Martin et al., 2000). In a study conducted by Fernández et al. (2016), a strong relationship was found between the therapeutic alliance and therapeutic outcomes in psychological counseling for adults and adolescents. In a study conducted by Martin et al. (2000), a moderate, significant positive relationship was found between the therapeutic alliance and the outcomes of the counseling. Given the explanations made, it is seen that the therapeutic alliance variable in the counseling process is a powerful variable that affects the counseling outcomes.

Identifying the factors that affect the alliance, as well as the therapeutic alliance itself, appears to be of interest for process and outcome research (Horvath and Symonds, 1991; Miller-Bottome et al. 2019). According to Hackney and Cormier (2008), the characteristics of the psychological counselor are very important factors affecting the change in the client during the qualified counseling process. Kivlighan et al. (1998) stated that the psychological counselor's attachment and attachment styles were a powerful factor affecting the therapeutic alliance in the counseling process. The basis of the attachment behavior, which is defined as the strong emotional bonds developed by a person towards others, is based on the relationship between the baby and the caregiver (Bowlby, 1980). Bowlby (1979, 1980) stated that there were three types of attachment styles namely, secure, insecure-anxious and insecure-avoidant. According to Bowlby (1980), for babies to have a fully secure attachment in their relationship with the caregiver, it is necessary to meet their need for protection and discovering environmental stimuli. Babies develop insecure attachment styles if the caregiver shows inadequate, inconsistent, uncertain, or insecure attitudes towards meeting these needs. Bowlby (1980) argued that attachment styles guided one's thoughts, feelings, and behaviors in later relationships. Meyer and Pilkonis (2001) suggested that therapists with a secure attachment style would cope more easily with the therapeutic interruptions than the therapists with other attachment styles.

McEvoy et al. (2014) stated that the self-regulation skills of psychological counselors were also an important determinant in the counseling process. Zimmerman (2000) defined self-regulation as planned behaviors that are cyclically adapted to achieve spontaneous emotions,

thoughts, and goals, and stated that it included behavioral, environmental, and latent regulation processes to achieve goals. Baumeister and Vohs (2007) strengthened the interpersonal acceptability of self-regulation skills by improving individuals' social adaptation skills. According to these explanations, psychological counseling requires structured plans, selection of methods and techniques appropriate for the plans, and their implementation. When the self-regulation literature is examined, it can be seen that there is a relationship with attachment styles, one of the variables of this study (Baysal and Özgenel, 2019; Bazzazian and Besharat, 2011; Blalock et al., 2015). In a study conducted by Bazzazian and Besharat (2011), it was found that there was a positive relationship between the secure attachment style and self-regulation skills and that there was a negative relationship between the anxious and avoidant attachment style and self-regulation skill.

According to the findings in the literature mentioned above, the therapeutic alliance skill of psychological counselors is an important part of the therapeutic process and a powerful factor affecting therapeutic outcomes. Therefore, knowledge of the variables that are correlated with this factor is of significance in terms of the therapeutic alliance. In particular, it is necessary to investigate which characteristics of the psychological counselors, who initiate, structure, and direct the therapeutic process, affect the therapeutic alliance. Carrying out therapeutic alliance studies on psychological counselors is a valuable stage in terms of guiding psychological counselors, revising knowledge and skills, and developing professional attitudes. Considering these requirements regarding the therapeutic alliance, this study aimed to examine the relationship between the therapeutic alliance skills of prospective psychological counselors and their attachment styles and self-regulation skills. On the other hand, this research will present new evidence on how the personal characteristics of the psychological counselor affect the therapeutic alliance established with the client. These pieces of evidence are thought to be important in increasing the knowledge and skills of prospective psychological counselors and other mental health professionals. When considered in this context, this study investigated the predictive effects of the gender, attachment styles, and self-regulation skills of the psychological counselors on therapeutic alliance.

METHODOLOGY

The method section of the research presents information about the study model, study group, data collection tools, data collection process, and data analysis.

The study model

This study, which investigated the relationship of psychological counselors' therapeutic alliance skills with different variables, used the relational survey model, which is evaluated within the scope of the survey models. This model can be used in research to determine the covariance levels between multiple variables (Cohen et al., 2000). The study used a correlational model because it aimed to determine the variance that the therapeutic alliance variable went through depending on attachment styles and self-regulation skills. In the study, we tried to determine the change that the therapeutic alliance skills of prospective psychological counselor went through based on their attachment styles and self-regulation skills. For this reason, it can be said that the research model is the correlational survey model.

The study group

The study group consisted of a total of 460 4th-year Guidance and Psychological Counseling undergraduate students, including 110 (23.9%) males and 350 (76.1%) females. In the study group, the students had already completed the 4th-year course, "Psychological Counseling Applications", successfully and therefore fulfilled 10 individual counseling practice sessions in total within a 14- week period in the presence of a supervisor. According to this explanation, it can be said that the research group was formed using the "purposive sampling" method. The study group was determined using the purposive sampling method. According to Büyüköztürk et al. (2013), the purposive sampling method should be used when the research is carried out on a study group created under certain criteria. It can be said that the group of this study was determined using the "purposive sampling" method since the group involved prospective psychological counselors who held at least 10 counseling sessions for at least 14 weeks accompanied by a supervisor.

Data collection tools

The therapeutic alliance scale-psychological counselor form

This scale was developed by Kandemir (2020) based on Bordin's (1979) theory to measure the therapeutic alliance skills of mental health professionals who provided psychological assistance. In the validity study, a 20-item and three-factor scale was obtained after the exploratory factor analysis, and the reliability of the obtained structure was calculated based on Cronbach's alpha internal consistency coefficients. In addition, the factor structure of the scale was examined with confirmatory factor analysis, and adequate goodness of fit coefficients were obtained (x2 /sd = 3.48; RMSEA 0.07; CFI 0.93; IFI 0.93; NFI.91; TLI 0.92; and RFI 0.88). In this study, Cronbach's alpha internal consistency coefficient of the scale was found to be 0.86 for the overall scale.

The Interpersonal Attachment Styles Scale: The scale was developed by Kandemir and İlhan (2017) considering Bowlby's (1980) theory of the theoretical foundations of the attachment concept. During the development of the scale, data were collected from university students for exploratory and confirmatory factor analyses. As a result of the exploratory factor analysis, a three-factor structure was obtained. The factors were named as "secure attachment", "anxious/obsessive attachment", and "avoidant attachment", respectively. Cronbach's alpha internal consistency coefficients of the scale were found as 0.80 for the first factor, 0.74 for the second factor, and 0.72 for the third factor. As a result of the confirmatory factor analysis applied to the interpersonal attachment styles scale, adequate goodness of fit coefficients were obtained (x2 / sd = 3.15; RMSEA 0.06; CFI 0.91; IFI .90; NFI 0.90; TLI 0.91; GFI 0.92; and AGFI). In this study, Cronbach's alpha internal consistency coefficients of the scale were found to be 0.87 for the secure attachment factor, 0.83 for the anxious attachment factor,

Table 1. The correlation analysis between variables.

Variable	Mean	Sd	1	2	3	4	5
Therapeutic alliance (1)	4.92	0.52	1				
Secure attachment (2)	5.58	0.80	0.29**	1			
Anxious attachment (3)	3.70	1.15	-0.26**	-0.11*	1		
Avoidant attachment (4)	3.26	0.98	-0.37**	-0.21**	0.12*	1	
Self-regulation (5)	4.11	0.59	0.24**	0.61**	-0.17**	-0.11*	1

*p<.05; **p<.01.

and 0.80 for the avoidant attachment factor.

The emotional literacy scale - self-regulation sub-dimension (ELS):

The emotional literacy scale was developed by Palancı et al. (2014) to determine the emotional literacy skills of young people and adults. To determine the construct validity of the scale, exploratory factor analysis was applied to the collected data. Then, confirmatory factor analysis was performed on the determined structure. Firstly, as a result of CFA, the goodness of fit values of the emotional literacy scale were found to be X2, 3.47; RMSEA, 0.06; CFI, 0.98; GFI, 0.95; NFI, 0.97; IFI, 0.99; RFI 0.96; and AGFI 0.93. In this study, which investigated the therapeutic alliance skills of prospective psychological counselors, the self-regulation sub-dimension of the emotional literacy scale was used. For this study, the internal consistency score of the "self-regulation" sub-dimension of the scale was recalculated and was found as 0.93.

Data collection and preparation for analysis

The data of the study, which examined the relationship between the therapeutic skills of prospective psychological counselors and their attachment styles and self-regulation skills, were collected in the last week of the Psychological Counseling Practices course in the 2019-2020 academic year. The scales were administered after obtaining necessary permissions, and data were collected from students in the classroom environment using the scales.

The scale forms were distributed to the students to collect the data of the study, which investigated the relationship between the therapeutic skills of psychological counselors and their attachment styles and self-regulation skills. In addition, a sample application related to each scale was performed by the researcher. The data were collected from the study group by providing them with information about the purpose of the research, scales, and how to fill out the scales. After the collected data were entered into a file of the SPSS software package, some preliminary evaluations were made before the analysis. Extreme values were examined through the frequency distributions and Z values of the study data, and as a result of the examination, the extreme values of 6 data that were outside the range of +3 and -3 were removed from the data set. Another prerequisite of regression analyses is the absence of collinearity and multicollinearity (Çokluk et al., 2012). To ensure this, correlation analysis results were examined, and it was observed that there was no problem of collinearity and multicollinearity between variables. At the same time, the normality of variables was examined with the Kolmogorov-Smirnow test. The results of the Kolmogorov-Smirnow test indicated that therapeutic alliance scores showed a normal distribution (D (454) =. 26, p>0.05). At the same time, the skewness and kurtosis values of the variables were examined, and it was found that these values were in the range of ± 1.96 and that they were acceptable (Tabachnick and Fidell, 2001). According to these results, it is possible to say that therapeutic alliance and other research variables did not create any problems related to normality for path analysis, which is a regression model.

FINDINGS

The findings section of the research presents the descriptive analysis of the variables, correlation analysis between variables, and the analysis results of the tested conceptual model. First of all, the descriptive results obtained from the therapeutic alliance, attachment styles and self-regulation scales and the correlations between variables were examined. The results are shown in Table 1.

As seen in Table 1, the mean score of the therapeutic alliance, which is the dependent variable of the study, is 4.92. The mean scores of the secure attachment style obtained as a result of the analysis are higher than the mean scores of the anxious and avoidant styles. As can be seen, the score obtained from the avoidant attachment style is lower compared to that of other attachment styles. Besides, the mean self-regulation score of the research group is 4.11. When correlation values are examined, it can be seen that there are significant relationships between variables related to the therapeutic alliance. Accordingly, a moderate, significant positive relationship was found between the therapeutic alliance of psychological counselors and their secure attachment (r = 0.29); also a significant negative relationship was found between the therapeutic alliance of psychological counselors and their anxious attachment (r = - 0.26) and avoidant attachment (r = - 0.37). Additionally, there were moderate level, significant positive relationships between the therapeutic alliance and self-regulation (r =0 .24). After that, hierarchical regression analysis was carried out to test whether the therapeutic alliance was predicted by the relevant variables. In the hierarchical regression analysis, a two-step model was tested. Accordingly, attachment styles in the first step and self-regulation skills in the second step were included in the model. The analysis results of the model created with these steps are presented in Table 2.

As seen in Table 2, in the first step of the step-by-step

Table 2. The hierarchical regression analysis related to the prediction of therapeutic alliance skills of psychological counselors.

Model	Variable	B	Standard error	β	t	p	Paired r	Partial R	VIF
	Constant	6.26	0.44		14.22	0.00			
	Secure attachment	0.16	0.06	0.15	2.80	0.1	0.22	0.12	1.18
1	Anxious attachment	-0.22	0.04	-0.23	-5.41	-0.00	-0.26	-0.25	1.11
	Avoidant attachment	-0.36	0.05	-0.30	-7.50	-0.00	-0.37	-0.33	1.08
$R=0.42; R^2= 0.21 F= 39.04$									
	Constant	5.78	0.46	0.11	12.53	-0.00	0.22	0.10	1.38
	Secure attachment	0.01	0.07		2.01	-0.04			
2	Anxious attachment	-0.21	0.04	--0.21	-5.10	-0.00	-0.26	-0.23	1.15
	Avoidant attachment	-0.38	0.05	-0.29	-7.79	0.00	-0.37	-0.34	1.09
	Self-regulation	0.31	0.09	0.17	3.17	0.01	0.24	0.15	1.63
$R=0.43 R^2=0 .22 F= 32.38$									

conducted hierarchical analysis, the attachment styles of the prospective psychological counselors wereadded into the regression model, and the total contribution of the first step to the model was significant ($R = 0.42$, $R^2 = 0.21$, $p<0.01$). In other words, it can be said that the attachment styles added into the model in the first step of the model had specific and significant effects on the model. When the standardized regression coefficients are examined, it can be seen that the secure attachment style of the prospective psychological counselors in this step had a significant and positive effect on therapeutic alliance ($β = 0.15$, $t = 2.80$, $p<0.05$). Accordingly, the secure attachment style of psychological counselors positively predicted the levels of the therapeutic alliance to be established with their clients. In other words, people who offer professional psychological counseling can easily develop an alliance with their clients about the goals, duties, and communication styles of the therapy. In the first step, it was found that the anxious attachment style included in the model negatively and significantly predicted the therapeutic alliance levels of the psychological counselors ($β = -0.23$, $t = -5.41$, $p<0.01$). At the same time, it was found after the analysis that avoidant attachment style negatively and significantly predicted the therapeutic alliance levels of the prospective psychological counselors ($β = -0.30$, $t = 7.50$, $p<0.01$). Accordingly, anxious and avoidant attachment styles, known as insecure attachment styles, were found to be an important negative predictor of the therapeutic alliance. According to the results of the study, the insecure attachment styles (anxious and avoidant) of the individuals who provide psychological counseling negatively affect the development of alliance/cooperation with their clients in terms of the goals, duties, and communication styles of the therapy.

In the second step of the hierarchical analysis, the self-regulation skills of the prospective psychological counselors were added into the regression model, and it was determined that that the total contribution of the second step to the model was significant ($R = 0.43$, $R^2 = 0.22$, $p<0.01$). When the standardized regression coefficients are examined, it can be seen that self-regulation skills of the prospective psychological counselors in this step had a significant and positive effect on their therapeutic alliance ($β = 0.17$, $t = 3.17$, $p<0.05$). Accordingly, the high level of self-regulation skills of psychological counselors positively predicted the therapeutic alliance to be established with their clients. In the second step, with the addition of the self-regulation skill into the model, the values regarding the predictive effects of the attachment styles that were added into the model in the first step changed partially. Table 2 presents the values for these variances. In addition, it is possible to say that the concurrence of the attachment styles and self-regulation skills of the psychological counselors in the same regression model has a significant effect on the psychological counselors' ability to establish a therapeutic alliance. According to the results of the study, it can be said that two factors that affect the therapeutic alliance that prospective psychological counselors develop with their clients are attachment styles and self-regulation skills.

DISCUSSION

The findings of the research were evaluated by comparing them with related research findings and theoretical information.

As a result of the research, it was found that attachment styles had a predictive effect on therapeutic alliance. According to these predictive relationships, the secure attachment was found to have a positive effect, while anxious and avoidant attachment had a negative effect. Some studies in the literature were found to support these findings (Bruck et al., 2006; Kandemir and İlhan, 2020; Yusof and Carpenter, 2016). In a study conducted by Bruck et al. (2006) on 46 therapists, it was found that therapists with a secure attachment style

developed strong therapeutic alliances with their clients. In the same study, it was found that therapists with insecure attachment styles (anxious, avoidant) had difficulties in developing therapeutic alliances with their patients. In a study conducted on psychological counselors, Kandemir and İlhan (2020) found that psychological counselors with a secure attachment style established a very strong therapeutic alliance with their clients, whereas the therapeutic alliance establishment skills of counselors with anxious and avoidant attachment styles decreased. Bowlby (1979) thought that the relationship between a baby and a caregiver was important in the development and maintenance of internal representations or internal models. According to Bowlby (1979), internal representations that are created affect the relationships that the individual will later develop with others. Similarly, Henderson et al. (1997) stated that the internal representations formed in the attachment relationship tended to be self-managing and that these representations would guide the formation of relationships that would develop outside the family. Accordingly, psychological counselors can strengthen the therapeutic alliance by directing the internal representations, such as feeling valued, establishing closeness, and a safe base, which they gained in the secure attachment in their healthy relationships with their mother, to the client. On the other hand, the therapeutic bond can be weakened when psychological counselors reflect the internal representations that involve insecure attachment features that they developed in childhood to the relationship established during the counseling process. According to the literature, people with secure attachment characteristics have better interpersonal communication skills, such as empathy, sincerity and emotional intelligence (Zaynab and Baghmalek, 2017). Accordingly, psychological counselors who have a secure attachment style can make natural and positive contributions to the counseling process with their skills, such as emotional awareness, empathy, and sincerity. On the other hand, according to Collins and Read (1990), individuals who have a secure attachment style do not pose a threat to the self of others at the same time. Individuals with secure attachment care about others' as well as valuing their own selves (Bartholomew and Horowitz, 1991). According to Hazan and Shaver (1987), individuals who acquire an anxious attachment style have low perceived self-worth and have concerns about rejection in interpersonal relationships, while those who develop avoidant attachment styles regard their own self as valuable and have a very low awareness of others' self-values. According to these explanations, psychological counselors with a secure attachment style also care about the self of clients, and therefore the counselor tries to establish a therapeutic alliance where the client does not need to protect their self. Since counselors with insecure attachment style feel their self-worth is under threat, the level of alliance developed with the client is likely to decrease. This situation explains to a certain extent why prospective psychological counselors who have a secure attachment style develop better therapeutic alliances/cooperation with their clients compared to other attachment styles.

In the study, it was found that the self-regulation skills of the prospective psychological counselors had a positive effect on their therapeutic alliance levels. Studies supporting this result of the research in the related literature have not been found. On the other hand, evaluations emphasizing the importance of self-regulation skills in the therapeutic process have been reached (McEvoy et al., 2014). McEvoy et al. (2014) stated that the self-regulation skills of psychological counselors were an important variable in the therapeutic process. Self-regulation requires the individual to make choices with conscious awareness, to make plans and organizations, and to control and implement the plans and organizations (Baumeister et al., 1998). According to these explanations, psychological counseling requires structured goals, plans, selection of methods and techniques appropriate to the plans, the configuration of tasks/responsibilities, and their implementation. These responsibilities and skills can be fulfilled by psychological counselors with self-regulation skills.

In the counseling process, the attachment styles of the counselors are an important variable affecting the therapeutic alliance they develop with their clients. Harris (2004) stated that anxious and avoidant attachment style could be transformed into trust gained with insight-based methods and approaches in the therapeutic relationship. Accordingly, in the education and supervising process of psychological counselors, developing awareness of attachment styles and their effects on the therapeutic process may be important in terms of the therapeutic alliance. In the current study, it was found that self-regulation skills positively affected the therapeutic alliance process. Therefore, during psychological counseling education, studies can be carried out to develop skills, such as making counseling plans and preparations, preparing a formulation, creating a treatment plan appropriate for the client, working on the goals of the counseling, or making preparations for counseling in terms of cognitive and emotional aspects, which can be evaluated within the scope of self-regulation. The therapeutic alliance is a two-sided concept. On one side of the therapeutic alliance is the psychological counselor and the client on the other side. This study focuses on the psychological counselor side of the process. Studies that collect data from clients are also needed to contribute to a better understanding of the therapeutic alliance. Moreover, it is thought that whether the therapeutic alliance skill of the prospective psychological counselors and the alliance skills they develop with their supervisors have an effect on the level of the alliance they have established with their clients is

considered to be a topic that is worth investigating to define the nature of the alliance. Finally, determining the basic counseling skills, competencies, and related self-efficacy beliefs of prospective psychological counselors with various studies may make significant contributions to the understanding of the concept of the therapeutic alliance.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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The effect of school-family collaboration and parent's behavior on students' ethical behavior

Özlem Gülgez, Reyhan Sekerci*, Afsin Ülker, Yunus Yagci, Alper Güven, Recep Emre Öztürk

Ministry of Education in Turkey, Turkey.

The aim of this study is to provide opinions on the evaluation of parents' attitudes and behaviors in developing cooperation in ethical education. Although the research is a qualitative study, the study group consists of 10 participants, 5 principals and 5 teachers. A semi-structured interview form was prepared and interview technique was used to collect data. The data were analyzed using the content analysis technique. According to the results of the research, to increase children's awareness of ethical principles and moral virtues, to support each other between family and school so that children can become good people, to transform the understanding of school-family cooperation to contribute to moral education, to the moral maturation of children in order to cooperate with the child and school, effective and new ways should be developed and various and different measures should be taken to carry out these actions. To be positive, desirable and morally mature for children, the school and family must be able to collaborate with the child and find effective and new ways to do this. In the field of moral education, it is essential to provide the measures that families and all collaborators should take, by revealing the need and understanding of cooperation. It is necessary to provide follow-up and support that can ensure very carefully school-family-child cooperation for maximum implementation.

Key words: School-family cooperation, moral education, ethics, opinions.

INTRODUCTION

The factors that increase children's indifference and alienation of moral virtues are increasingly complex, uncontrolled and noticeable. School and families need each other's support to raise children as good people. Therefore, there is a need for the transformation of school-family cooperation understanding in a way that contributes to moral education (Kesgin, 2019). For example, in a study that attempts to illuminate the general structure of parental behavior, three basic and several secondary syndromes have been revealed with a situation analysis of parental behavior scales. These syndromes have been found to be associated with other aspects of home as well as parental behavior. More importantly, these parental behavioral patterns have been found to be associated with meaningful and explicable trends in the development of child personality. In addition, to provide this basis for the conceptualization of parental behavior, the study contributed to understanding the three isolated aspects of the parental-child relationship. The first is the analysis of democracy at home. A second

contribution was the definition of parental behavior in a farm culture. A third contribution was findings regarding the model of the home environment to changes in the child's IQ. Although no preliminary conceptualization, like now, can be completed, it has been observed that a better understanding of parental behavior can be achieved without causing excessive simplification of complaints (Baldwin et al., 1945). For this reason, it is thought that the current situation needs a change and this change is possible by educating children and instilling ethics and values along with the academic curriculum (Nirupama and D'Souza, 2021).

Reports of the discrete components of parental behavior were collected on the scale of the Parental Behavior Inventory Reports of Children and Acceptance-Rejection, Psychological Autonomy-Psychological Control and Firm Control-Lax Control were defined in 4 correlation matrices of mother and father behavior reports by children and adults. The conceptual planes created by a couple of factors have differentiated the Separation of Individualization from Loving Participation and Enemy Participation from Enemy detachment. This configuration analysis made it easier to compare these results with other analyses of the parental behavior structure. A different global conceptual model has been tried to be proposed for parental behavior (Schaefer, 1965). An objective assessment of the strengths and needs of the family is the logical starting place to provide support to families in the most useful and cost-effective way possible. The Parental Behavior Checklist (PBC) was developed to contribute to this family assessment process. PBC is an empirically derived tool specially developed for parents of children from 1 to 4 years old. It was normed in a representative example of 1,140 mothers and tried to measure three dimensions of parenting: Expectations, Discipline and Rearing. The data obtained is expected to lead to the identification of parenting powers and needs that can be transformed into simple, understandable and practical intervention strategies (Fox, 1994). In another study, the behavior patterns of 46 mothers for their first and second born children were compared. The data are interpreted as follows: (1) mothers' first behavior unlike second children is "emotionally less warm and more restrictive and challenging", (2) mothers' behavior towards second children does not change, (3) their are mothers who often tend to be consistent in their method of raising their first and second children, (4) first and second born siblings are an important determinant of the mother's behavior towards two children (Lasko, 1954). In another study, the factors responsible for instilling ethical and child rearing values were analyzed and the roles, duties and responsibilities of the family in this process were mentioned (Ojakorotu and Obah-Akpowoghaha, 2020).

The need for research in parental behavior for quantitative measurement that allows comparison of homes using the Fels Parental Behavior Rating Scales in the Fels Research Institute program has led to the development of a scale to support the usual clinical summary. Such ratings, when properly designed and used, provide valuable information in the form of reliable measurements that are not normally obtained by home visitors. The usefulness of these scales is based on the belief that the rating method can be precise and scientific. The relevant dimensions of parental behavior were defined, and these dimensions represented the factors obtained by the factor analysis method. It was then seen that the factors were the result of comparing the factor analysis of different evaluators. When the Fels Master Behavior Rating Scale was conducted by trained evaluators, it was structured and defined in such a way that the ratings in one house were consistent and that two evaluators who made independent decisions accepted their views on each house. In addition, two independent graders interpreted the scales in the same way as shown by their similarity in the correlation patterns (Baldwin et al., 1949). In another study, the direct relationships between the classroom and family context and the life satisfaction of adolescent students and the indirect relationships between these variables through adolescents' academic, familial and social self-concepts were analyzed from a gender perspective, and the quality of parent-child relationship was analyzed both directly and indirectly. It was thought to affect through self-concepts. The results revealed that there is a direct positive relationship between family environment and behaviors (Povedano-Diaz et al., 2020).

Parental Behavior Inventories (PBI), frequently used in literature, can be considered as a short measure of parenting behavior for use with preschool and young school age parents. A parent self-report measure can be used as a report measure or an observational rating scale for those familiar with the parent. Its parallel forms offer clinicians and researchers a single measure capable of multimethod, multi-informant and multisetting evaluation. PRI's two independent scales, supportive/interactive and enemy/challenging, have sufficient content validity, show adequate internal consistency and test-retest reliability, and are related to measurement of parental impact, parental stress and child behavior problems. Evidence of its usefulness is provided as a rating scale. The results provide support for the reliability and construct validity of PBI and demonstrate its versatility as a measure of parental behavior (Lovejoy et al., 1999). Again, during a medical procedure necessary for the treatment of pediatric cancer, the effect of demographic, medical and psychological factors on general pediatric diseases and (2) to provide explanations about the procedures in a study where the relationship of individual parental behaviors were measured during the stages of the procedure, what is most obviously related to the diseases behavior was found. The effect of the parental explanation was dependent on when the explanation was given and the level of discomfort at the

time of the child (Jacobsen et al., 1990). The implementation of the education adopted in this regard for family life can positively affect the well-being of the individual and the family by helping families help themselves. Family life is a visual example that combines the foundations and basic principles of the education model to be given with changes in culture, context, content, practice, and family well-being over time (Darling et al., 2020).

As can be seen from this point of view, first of all, to raise healthy children physically and spiritually, to increase the sensitivity of children about moral virtues, to support the school and families in order to raise children as good people, and to transform the understanding of school-family cooperation in a way that contributes to moral education, effective and new ways need to be developed in order to cooperate with the child and school together for maturity. In this study, the answer to the following question was sought in order to take measures that can provide school-family-child cooperation in the field of moral education by revealing the need and understanding of cooperation: (1) What are the opinions of school principals and teachers in evaluating parents' attitudes and behaviors in terms of developing cooperation in moral education?

METHODS

Research design

According to Karasar (2009), this study was a case study which was conducted using descriptive scanning model, in which a case or subject is described separately. Descriptive scans are studies conducted on large groups, in which the opinions and attitudes of the individuals in the group about a case are taken and these cases are tried to be described. In order to do that description profoundly, the qualitative research technique was used in the study (Turgut, 2009). Thus, interview technique was used in the study to collect data and for that purpose, a semi-structured interview form was prepared.

Study group

The sample group consists of administrators and teachers working in primary and independent kindergartens in Konyaaltı district of Antalya province. In addition, convenience sampling which is among purposeful sampling methods was used in the study. The participants were coded as: P1, P2, P3, P4, P5, T1, T2, T3, T4, and T5 according to the order of interviews (Kus, 2007; Mason, 2002; Patton, 1990; Rubin and Rubin, 1995; Yildirim and Simsek, 2006).

Data collection tools

Interview questions were prepared on the basis of a literature review and were examined by a field expert on qualitative researches. The questions were finalized based upon the feedback received from these interviews. There were ten interview questions. The questions are as follows: What is the effect of parents' attitudes and behaviors on developing cooperation in moral education? What are the problems you experience in classroom management related

to the topic? When there is a problem, is there the behavior of complaining to senior managers? If yes, how and in what way? What are the unethical behaviors you encounter on the subject? What are your solution strategies for the moments you have trouble? What exactly are the behaviors and supports you expect from parents in developing cooperation in moral education? What kind of path do you prefer to follow with the parents you have problems within the next process? What are the behaviors you find unethical in your problems with parents? What other points would you like to add? The participants who were considered for the interview were informed about the purpose of the study and those wanting to participate in the study were determined on voluntary basis. The researcher took notes synchronously with the interviews. The interviews lasted about 30 to 50 min. It was held in the relevant school directorates between January and February 2021.

Data analysis

In the study, the qualitative data acquired from the interviews were analyzed using content analysis, which is composed of the stages of coding, finding themes, organizing the data according to codes and themes (Balci, 2004; Yildirim and Simsek, 2011). The interviews recorded were put in writing by the researchers in computer environment. Then, all the data acquired in the study were read many times and coded. While coding, various dimensions were determined in accordance with the purpose of the study and themes were determined for these dimensions. Another researcher recoded the interview texts to provide reliability of the analyses. In order for validity and reliability to provide objectivity in a good qualitative study (Morse et al., 2002), a consensus was considerably achieved between codings of the researcher and another expert to a large extent and it was concluded that the process of coding was performed in a reliable way. Also, reliability of the comparative agreement between codings was determined by two independent researchers by calculating the Cohen's Kappa consistency coefficient in the SPSS 21.00 packaged software. The coefficient found was 0.71 meaning consistency between raters is 71.0%. According to Cohen's coefficient classification, Kappa result can be interpreted as follows: < 0, No agreement; 0.01 - 0.20, Slight agreement; 0.21 - 0.40, Fair agreement; 0.41 - 0.60, Moderate agreement; 0.61 - 0.80, Substantial agreement; 0.81 - 1.00, Perfect Agreement (McHugh, 2012). According to the scale, it can be seen that agreement between researchers is in a substantial level.

RESULTS

The findings obtained from the views regarding the evaluation of parents' attitudes and behaviors in developing cooperation in moral education and their comments are given.

The distribution of the participants by age, gender, marital status, educational status, professional service period, management period, task, staff status and class variables are shown in Table 1.

As shown in Table 1, majority of the participants are above 42. Their genders are equally distributed and most of them are married. Majority of the principals and teachers working in courses have a seniority for 20 years and more and have bachelor's degree. Most of them are working with secondment, whereas, principals are staffed.

Regarding the demand for class and school change in the first problem given in Table 2, P1 said,

Table 1. Distribution of participants by demographic features.

Variable	Code	P1	P2	P3	P4	P5	T1	T2	T3	T4	T5	f	%
Age	22-42		√									1	10
	42-60			√	√	√						3	30
	60+	√					√	√	√	√	√	6	60
Gender	F			√	√	√	√	√			√	6	60
	M	√	√						√	√		4	40
Marital status	S			√	√							2	20
	M	√	√			√	√	√	√	√	√	8	80
Educational background	Primary Education											0	0
	High School						√	√	√	√	√	5	50
	Undergraduate and above	√	√	√	√	√						5	50
Duration of professional service	1-5											0	0
	6-10		√									1	10
	11-15											0	0
	16-20											0	0
	20+	√		√	√	√	√	√	√	√	√	9	90
Staff condition	Staffed	√	√									2	20
	Secondment			√	√	√	√	√	√	√	√	8	80

Table 2. School principals "views on evaluating parents" attitudes and behaviors in developing cooperation in moral education.

Theme	P1	P2	P3	P4	P5	f	%
Requesting a change of class and school in the first problem	√					1	20
Complain to top managers when there is a problem		√				1	20
Expect discrimination due to social status			√	√		2	40
Threats and aggression to other students who have problems	√			√		2	40

"If we put aside the parents not wanting to come to school, the first reaction is to ask for the change of class or school. Parent obviously does not even want to fully understand what the problem is, we really have a hard time cooperating on this issue. At this stage, we cannot even talk about the virtues that parents should have, because most of the parents cannot approach the events unfortunately fairly with the simplest sense of motherhood and paternity. "

Regarding complaints to top managers when there is a problem, P2 said,

"Do you believe in many issues related to school? They think that the higher it can reach, the more the problem will be solved in their favor. On the contrary, timely and correct intervention has more impact. For this reason, the measured and wise approach of parents is very important to us."

He expressed his sensitivity about the subject. Regarding waiting for privilege due to his social status, P3 said,

"Unfortunately, many parents are waiting for discrimination due to their social status. However, in such an approach, they do the biggest evil to themselves. The more you protect and discriminate a child, the more damage you can cause to that child's development. Then how will the child learn to be patient, equity, and persistence? "

Regarding threatening and aggression of the other student who had problems, P4 contributed by saying,

"This is very interesting, something I have observed in some parents, when two children have problems, the

Table 3. Teachers views on the evaluation of parents attitudes and behaviors in developing cooperation in moral education.

Theme	T1	T2	T3	T4	T5	f	%
Parents who have problems usually do not want to go to school / Insensitivity to problems	√			√		2	40
Justifying and defending your own child	√	√				2	40
Threat of complaining to top managers when there is a problem			√			1	20
Asking special attention to your child / Asking him to sit close to the teacher		√		√		2	40

parent wants to see the other student himself and wants to warn and warn himself. I forget that the other person is also a child and that someone else is a child, so frankly, I am careful not to confront the parents or their children who have problems. Because families cannot be objective, equitable and fair, they always look for the crime in the child and family. I believe that every family and child should be interviewed one by one. But in some cases, for example, parent meeting, school playground, canteen, etc,. they come together in places. Then you can analyze how tolerant and understanding people are, principals and teachers should be very careful and sensitive in this regard."

His words are examples.

The themes determined regarding the opinions of the teachers regarding the evaluation of parents' attitudes and behaviors in developing cooperation in moral education are shown in Table 3.

Regarding the problem given in Table 3, parents usually do not want to come to school/Insensitivity to problems, T1 said,

"*The thing I feel most uncomfortable about is that the parents are insensitive to the problem and do not want to come to school, and when they come, they show discomfort, parents do not want to hear a problem or a problem for some reason. They are looking on the other side, however, it is extremely important for us to develop cooperation.*"

Regarding justifying and defending his own child, T2 said,

"*We have weaknesses in empathy, when the parent tends to justify his own child under all circumstances and when he goes to defense, he is unfair to his own child". In a small problem, they prefer to go to the manager or deputy manager first, which actually enlarges the problem and leaves it unresolved.*"

Regarding asking special attention to the child/asking him to sit close to the teacher, T4 said,

"*Every parent wants his/her child to sit close to the teacher in the front, in fact, my teacher calls the child in front of him, calling every minute by phone by phone, if there is a problem, call every minute information, picture. There are parents who want photos. Every minute we*

devote to them means stealing other children, this is not considered at all. I pay attention to some of my parents, they do not knowingly come to the parent meeting, and then they want to meet privately and get information".

His words are examples.

DISCUSSION

Ethical values with education are important at every stage of life. These are fundamental processes for human life. Education develops knowledge, helps to develop judgment and judgment, and also teaches ethics to identify the difference between right and wrong, while values help shape an individual's personality. The existence of these three and their contribution to the development of the individual and society is quite high. With these qualities, a good education must contain strong values, because values as well as education are needed to create excellent values. And ethics and values determine how we live our lives and how we treat each other; therefore, ethics should be instilled in formal or informal ways. Building students through the educational framework is very important, as students are part of society and part of tomorrow. Therefore, it plays an important role in explaining the meaning and importance of ethics and values in education, developing the personality of students and making them responsible citizens (Nirupama and D'Souza, 2021).

The number of studies addressing the importance of school-family cooperation in moral education is rapidly increasing (Yaşaroğlu, 2016; Li, 2017; Flyak, 2019; Maxwell, 2019; Jinga and Kimb, 2020; Botiraliyevna, 2019). For example according to a study examining the impact of parental involvement in the treatment of children's destructive behavior and its relationship with parental involvement in child psychotherapy, the in-session use of therapist's psychoeducation strategies (eg, discussing the causes of misbehavior, defining and providing logic for treatment, etc.) and other participation strategies (e.g. It is stated that determining collaborative goals, managing expectations, etc.) has a special importance. The findings revealed that modular therapy therapists provide more psychoeducation and other engagement strategies than normal care therapists. In addition, the application of psychoeducation strategies

after the introduction of psychoeducation strategies by therapists, on the use of other parent strategies in the early period and on the subsequent involvement of uniquely envisaged treatment, mediated by the effect of psychoeducation on parent involvement in the therapy of their children in the case of treatment (Martinez et al., 2017).

For example, in a study conducted in Africa, the factors responsible for instilling ethical and child-rearing values were analyzed, and ways of building on values and cultures aimed at reviving the general understanding of ethics and morality in the continent were presented. It is suggested that families and communities use the science of ethics and ethics more effectively in order to recall the forgotten cultural areas and values that will constitute ethics and child rearing norms (Ojakorotu and Obah-Akpowoghaha, 2020).

On the other hand, excessive use of parent digital technology, one of the most important issues of our time, has been associated with inadequate parent-child interactions, but no study examines relationships with child behavior. One study investigates whether the use of technology with parental problems is associated with technology-based disruptions called "technology" in parent-child interactions and whether technology is associated with child behavior problems. Parental reports from 170 US families and actor-joint interdependence modeling suggest that the use of digital technology with mother and father problems predicts more technology in mother-child and father-child interactions. Later, maternal technology reports were made that both externalize and internalize the behavior of mothers and fathers. The results show that technological interruptions are associated with child problem behavior, but future longitudinal studies require directionality and operational processes (McDaniel and Radesky, 2018).

In the studies of Piquero et al. (2016) who updated their meta-analyses in early family/parent education programs, appropriate studies were screened between January 2008 and August 2015. Twenty-three more studies were added to the original database of 55 studies that collected 78 appropriate study samples. The random effects model was used to obtain an overall average effect size estimate. Additional analyses were conducted to evaluate publication bias and control. In general, the average, positive and significant effect size was calculated as 0.37; this corresponds to 32 out of 100 people in a treated group, compared to 50 out of 100 people in a broken control group. Some evidence of publication bias and auditing has been identified. Early family/parent education programs have been evaluated as an evidence-based effective strategy to prevent antisocial behavior and guilt.

On the other hand, there is growing interest in mindful parenting and how deliberate or compassionate interactions with young people are associated with developmental outcomes. In a study that investigates

how parenting has changed naturally over time or in response to interventions, and how this change is related to other proximal developmental changes, data from a longitudinal, randomized controlled study design (N = 432 family) was used to investigate the relationship between careful parenting changes and 3 outcomes: positive parenting, quality of parent-youth relationship and youth aggression, differences between 3 intervention conditions and between mothers and fathers were tested. Results among the conditions, changes in careful parenting were strongly associated with changes in all 3 outcomes for both fathers and mothers. Changes in careful parenting varied considerably within and between conditions. For fathers, differences in careful parenting change primarily resulted from changes in the basic careful parenting dimension of emotional awareness. Mothers showed comparable changes in terms of careful parenting between conditions. The findings show how changes in careful parenting are associated with proximal changes that can lead to reduced youth behavioral problems (eg aggression or substance use), and provide additional evidence for the contribution that awareness activities can make to standard parent education (Coatsworth et al., 2018). As a result, the school and the family should be able to cooperate with the child and find effective and new ways for them to be able to act positively in a positive, desired manner and morally mature. It should be emphasized that the center of cooperation is the child. In the field of moral education, by revealing the need and understanding of cooperation, it is essential to take the precautions that can ensure school-family-child cooperation very carefully, to be taken by families and all collaborators and to be implemented to the maximum extent, to follow up and provide support.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Difficulties encountered by students during distance education in times of confinement in Turkey

Yaprak Türkân Yücelsin-Taş

French Language Teaching Department, Atatürk Education Faculty, Marmara University, Turkey.

This article presents the issue of distance education in times of confinement. In particular, it points out the difficulties encountered by masters and doctoral students at French Language Teaching Department (FLT) of Marmara University during distance education. In this research, a semi-structured interview form, one of the qualitative research methods, was applied to 20 students. The data was collected from May to November, 2020. The main objective of this research is to make a general assessment of the data collected in the university context, more particularly in the masters and doctoral programs. With regard to the results of this research, it has been found that overwork, some technical problems, physical, psychological and financial problems are among the most pronounced problems.

Key words: Distance education, French language teaching, difficulties, students, master, PhD, higher education, lockdown.

INTRODUCTION

This study focuses on the emergent transition from face-to-face to distance education due to the COVID-19 health crisis. According to data published by UNESCO (2020), "191 countries have closed all their schools and more than 1.5 billion students from pre-school to tertiary level have been affected". This study also assesses the encountered problems only in higher education context.

As point out, Karsenti et al. (2020), "[…] the emergent transition from face-to-face to distance education, has become a central concern for universities around the world which seem to have transformed in a matter of months, thanks to Herculean efforts over the past summer, to prepare their trainers". As well as teachers, the emergent transition has influenced students around the world. This research will only be covering the difficulties encountered by students in distance education.

The research problem covers Covid-19 pandemic, which is a global health crisis, that forced schools to immediately switch to distance education. The compulsory and immediate transition to distance education poses several problems such as overwork, technical, physical, psychological and economic problems. This period has negative effects on teachers as well as students.

The main purpose of this study is to make a general assessment of the situation regarding distance education by defining the difficulties encountered by masters and doctoral students during distance education in the university context. The research was carried out from

E-mail: tyucelsin@marmara.edu.tr. Tel: 00 90 535 8804183.

May 2, 2020 to November 1, 2020 at French Language Teaching Department (FLT) of Marmara University with 20 masters and doctoral students enrolled in the Institute of Educational Sciences.

As regards to distance education, with the emergent transition from face-to-face to distance education due to the Covid-19 health crisis, it was discovered that new terms were used: "[…] to name this educational crisis (pedagogical continuity, alternative measures, teaching or learning at home, etc.)" (Karsenti et al., 2020). This definition shows that distance education has many names such as distance education, online teaching.

Distance education "[…] is certainly not just an "uploading" of content, but the conception of a new form of learning using innovative tools. Of course, it also requires a new conception of interactions among trainers, learners, tools, and content […]" (Merle and Yerlès, 2003). In the present study, this quote shows the importance of interactions between teachers, students, technical tools and training content.

METHODOLOGY

Qualitative research method was used in the study. "Most of the qualitative studies carried out in education can be considered as case studies because the qualitative studies aim to shed new light on particular educational phenomena" (Poisson, 1992). The sampling consists of 20 masters and doctoral students enrolled in the Institute of Educational Sciences at Marmara University. As the data collection tool, an online semi-structured interview was conducted with 20 students and their responses were collected. Blanchet and Gotman (2013) define the interview "as an investigative technique, which emerged from the need to establish a sufficient egalitarian relationship between the investigator and the participants so that the latter does not feel like being interrogated. Instead, they are only being asked for their opinions on the subject". Eight questions, three of which are open-ended questions, were developed for the semi-structured interview. After developing the interview questions, a pilot study was conducted and validated by the experts. According to the opinions of experts, necessary changes were made. Then, the interview was conducted with 20 students. All the participants gave their full consent to be interviewed. The data was collected and held anonymously. It consists of three main questions in addition to the demographic information of the participants:

1. Age:
2. Gender:
3. Nationality:
4. Civil status:
5. Do you work? If so, where do you work?
6. What platforms did you use during distance education?
7. What difficulties have you encountered during distance education?
8. What are the advantages of distance education?

RESULTS

According to interviews, the data was collected on the difficulties encountered during the distance education period for analysis. During the interview, 20 students were asked eight questions and their answers were noted. The length of the interviews was approximately ten minutes.

Demographic information

Regarding the data relating to demographic information, there are five variables such as age, sex, nationality, marital status and work. While for the age of the students, it ranges from 22 to 49 years old and the average age is 29.5 years old. The demographic information of the participants is shown in Table 1.

Regarding the gender of the students, the sampling consists of sixteen women and four men shown in Table 1.

Sixteen participants are Turkish citizens. The other participants consist of one French, one Cameroonian along with two French-Turkish dual citizenship holders. Considering the marital status of the participants, nine participants are single and 11 are married.

When the participants were asked about whether they were working, it was learnt that 14 of the participants were employed and all of them were working in the field of education. The remaining six participants continue only their education. When the occupation of the masters and doctoral students was examined separately, it was observed that all doctoral students were working. It was determined that all of the doctoral students, except one student, work in different public universities, and only one student was teaching at a private school. As for the master students, it was observed that six participants were working as French teachers in different private schools, from kindergarten to high school. It was found out that only one student gave private lessons, and another was working as a lecturer at a public university.

Considering the programs used in the department of French Language Teaching during the distance education period, all masters and doctoral students have only used Zoom and Skype without exception.

Difficulties encountered by students during distance education period

The problems encountered by the students in distance education period are shown in Table 2. All of the participants in the study pointed out that the workload has increased in terms of both education and chores. While everyone, except for one participant, mentioned that the workload has increased in this process, all female participants (16) highlighted that the workload at home was higher than in the past. During this period, all participants encountered some technical problems, while the most important problem was seen as the internet connection failure and its efficiency. Only one participant complained that she could not attend classes regularly due to the power failure. Most of the participants

Table 1. Demographic information.

Variable	n
Sex	
Female	16
Male	4
Nationality	
Turkish	16
Franco-Turkish	2
French	1
Cameroonian	1
Marital status	
Married	9
Single	11
Occupation	
Working	14
Not working	6

Table 2. Problems encountered by the students during distance education period.

Types of problem	n
Overwork	**20**
Education	19
Chores	16
Technical problems	**20**
Internet connection	16
Weak network	14
Power failure	1
Physical complaints	**17**
Back pain, neck pain and headache	15
Eye disorders	14
Physical fatigue	11
Psychological difficulties	**11**
Concentration problem at home	8
Mental fatigue	8
Lack of motivation	5
Isolation and loneliness	2
Financial difficulties	**3**
Lack of materials	3

mentioned that their physical problems such as back pain, neck pain, headache, and eye disorders are among the most common problems. Intense physical fatigue is stated by more than half of the participants (11). Another problem is grouped under the title of "psychological problems". Half of the participants experienced psychological problems arising from this period. Concentration difficulty, lack of motivation and mental

fatigue is among the most common psychological problems. Only two participants complained of isolation and loneliness. Economic difficulties are another problem and only three participants expressed this problem.

DISCUSSION

In this research, which was conducted in the context of this model and centers on the university students, it is aimed to determine how distance education has affected students and its positive and negative sides. As a result of the study, it was observed that there were more problems and difficulties, as well as various advantages. Our findings are supported by other researchers (Kaddouri and Bouamri, 2010).

After analyzing the data, the following problems were found: overwork, technical, physical, psychological and financial difficulties.

Overwork

Regarding the workload that all students complained about, Hélou and Lantheaume (2008) also described this period as «endless work». It has been stated that distance education takes more time than face-to-face education and requires more energy. Therefore, distance education is more tiring. In line with the data collected from female participants, it has been observed in many studies that women's workload both at home and at work has increased more compared to the past (Alon et al., 2020; Cin, 2020; Fabre, 2020). All these studies, as in almost every subject, draw attention to gender inequality even in higher education. While it was observed that both women's mental and physical workload increased (Fabre, 2020); in another study, inequality between men and women in terms of workload was also emphasized (Alon et al., 2020).

However, as Fabre (2020) mentions, "confinement is particularly a difficult time for women, in that, the burden of their mental load is increasing which can also be observed through comments shared on social media. It is particularly difficult to manage the teleworking, children's education, cooking and cleaning together.

The findings of this study are in agreement with previous studies. Additionally, Bautier (2020) stated that teachers also complained about the same problems.

Technical problems

One of the important problems encountered in the period is the technical problems relating to the internet connection. These problems were observed in all participants. Similarly, this observation complies with other studies. In a study conducted with 3300 university students in Morocco, it was found that "78% of the participants had problems with internet connection" (El

Marhum et al., 2020). Technical problems encountered in distance education have also been discussed in many studies and their findings support the present research (Bautier, 2020; Karsenti et al., 2020; Kaddouri and Bouamri, 2010).

Physical problems

Physical problems are also among the important issues mentioned by the participants. It has been observed that the vast majority of participants suffer from back pain, neck pain, headache, and various eye problems, caused by sitting for too long in front of a computer. A study conducted by "Association Paritaire Pour la Santé et la Sécurité du Travail, Secteur Affaires Municipales (2020)" indicates that physical fatigue and headache were among the most common complaints. So, this association found also similar disorders.

Psychological difficulties

Psychological problems are also important side effects of this period. Half of the participants in the study complained of some problems such as lack of concentration, lack of motivation, mental fatigue and loneliness. Béché and Schneider (2019) also mentioned isolation and emphasized that the students felt lonely in this period. While psychological problems were found in half of the students in this study, the rate was one in four in our previous research on teachers (Yücelsin-Taş and Le Lièvre, 2020). In our previous study, it was observed that teachers also encountered the same problems. In another research, the problem of isolation and concentration difficulty was observed (APSAM, 2020).

Financial difficulties

Economic difficulties are also among the problems most commonly stated by the participants. In the present study, a small number of students (three) pointed out that there was only one computer at home and they shared it with other family members. In addition, it was stated that there were problems in attendance to the lessons and preparing homework, especially if there is more than one student at home. Similarly, there are publications that mention the necessity of using the computer with family members: "I share my personal computer with my daughter[…]" (Bautier, 2020).

In addition to the problem of the financial difficulties, our study also mentions inequality among students. "The most worrying point is inequality among learners. Already existing inequality in our education system will grow because families are neither on economic equality nor especially social and cultural to help their children and guide them" (Bouvier, 2020). Also, another study points out that "[…] the pandemic has further exacerbated

existing social inequities, both in educational institutions and in digital use. More specifically, learners from the most disadvantaged backgrounds seem to have encountered particular difficulties, especially with regard to access to digital devices and the Internet"

Benefits of distance education

Besides the disadvantages mentioned earlier, it has been observed that this period has some positive aspects. Many of the participants mentioned not going to work as an advantage. Therefore, it was pointed out that not wasting time on the road and having a free environment at home are some positive aspects for the participants.

The following examples are cited on the subject: fifteen students mention some advantages such as "there is no more travel to do" and "distance learning has more freedom". Université Laval (2020) has been offering distance education courses since 1984 and today the university highlights several advantages of distance education. Another example is "greater flexibility in the organization of travel and work schedule for students and teachers". In other words, it is possible to say that we can talk about autonomy in terms of time management.

Conclusion

Distance education has become a way of communication and teaching/learning required by the Covid-19 pandemic today (International Association of Universities, 2020). Although advancing technology will necessitate distance education in the future, the existence of the pandemic today has exposed us to the reality of distance education. Distance education, which was not used often before, has become very important today. It will not be easy for teachers and students to adapt to this type of education in a short time. Teacher training is also an indispensable reality for successful and effective distance education (Vachon, 2013). Although distance education has some advantages, it is a fact that it also carries more problems. In the present study, similar results were found in accordance with the literature review. This study had to be conducted on a small sample due to the low quota of the current masters and doctoral programs; this situation is the most criticized part of the study. Therefore, it is believed that conducting studies with broader participation and more detailed inquiries will reveal the realities of distance education.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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