

ANNOTATION

For the thesis **"Increasing students' interest in mathematics on the basis of the method of peer instruction of the topic " Trigonometry " by Serkan Kaymak** to obtain the degree of Doctor of Philosophy (PhD) on specialty "6D010900 – Mathematics"

The relevance of the research

Rapid developments in science and technology have led to significant results in society's economic, social, and cultural life as the qualifications that people need to carry their educational understanding changes accordingly.

It is seen that there is no production and structuring of new information in the past with the current and innovative methods. The traditional teaching method is increasingly losing its importance. Now the education system has not only been to inform the students of the education system, but also to obtain and deliver information to them. The students direct their own learning by asking questions, estimating, finding, developing experiments, collecting data, and analyzing them. The more the training and teaching activity is addressed to the sensory organ, the more so that the learning event is permanent, the longer the information is remembered. In recent years, most of the studies on education are focused towards this. Rather than presenting the ready-made information to the student, the learning process is based on teaching students to learn and active participation of the learners. In the center of traditional teaching, the teacher is active, and the learner is the listener. Instead of assimilating and learning the information transmitted by teachers, students tend to memorize the information as it is transmitted directly.

Modern psychological and pedagogical science states that students learn more accurately and consistently than traditional teaching in courses taught on active learning strategies. According to the research of the Çelik, S., Şenocak, E., Bayrakçeken, S., Taşkesenligil, Y., & Doymuş, K., Bağcı Kılıç, Açıkgöz, K.Ü., Nurzhanova R.M, Simbaeva S. the problem of mastering the concepts of this topic in the courses taught to students using active learning strategies. It is expressed in various researches that the lessons taught with active learning, from the instructional strategy suggested by the researchers in terms of moving the constructivist theory to educational environments, provide conceptual learning and the skills that can be used in all areas of life. Due to the Allison, 2012 [12]; Kampit and Garin, in 2017 [13]; Crouch and Mazur, 2001 [6]; Demirel, 2013 [14]; Eryilmaz, 2004 [15]; Cuckoo, 2013 [16]; Lim, J.2014 [17]; Mazur, 1997 [5]; Miller, Santana-Vega and Terrell, 2006 [18]; Tokgez, 2007 [19], KB Zharykbayev and other scientists when a student actively participates in the learning process, motivation increases, learning skills increase, attitudes to the lesson are formed and a deeper understanding emerges. Many researchers who have seen the insufficiency of traditional teaching methods have started to develop alternative teaching methods and techniques in recent years. One of the developed alternative active learning teaching techniques is the peer teaching technique. The age of secondary school learners is the age of participation in groups. Participation of a secondary school student in a peer or playgroup is a necessity for both the child

and the socialization. This natural process is an opportunity for teachers to be used in education. Therefore, new approaches to education have been adopted. Peer instruction is one of the approaches based on group studies and learning by a discussion with peers, which gives a new perspective to mathematics. This approach is an active and cooperative learning method, and students are actively involved in learning processes.

The research Al-Zoubi and Bani Younes argue that low achievement in mathematics is a global problem. An analysis of the above works shows that this issue is still insufficiently studied. That is, to increase students' interest in learning mathematics, the issue of peer instruction is not considered in practice and requires special research based on active learning strategies.

The teaching of trigonometry in algebra focuses not only on informing students with learning materials, but also on the contradictions between the lack of self-management of knowledge through the transition to the format of feedback, assessment, research, experimentation, data collection and analysis. In the implementation of the requirements for the updated content of education there is a contradiction between the lack of clarity of the psychological and pedagogical basis for increasing interest in mathematics through the use of peer instruction in the teaching of trigonometry in algebra.

The search for solutions to these contradictions led us to identify the research problem and set the topic of the research as "Increasing students' interest in mathematics on the basis of the method of peer instruction of Trigonometry branch.

The purpose of the research: The goal of the research: to establish the interest of students theoretically in mathematics on the basis of the method of peer teaching of the section "Trigonometry" , to develop a methodology and to conduct experiments on its effectiveness.

Object of research: The process of teaching trigonometry in algebra

Subject of research: The use of peer instruction method in the teaching of trigonometry.

Scientific Prognosis of Study:

The effect of peer teaching on 9th grade mathematics achievement and attitudes towards mathematics;

1- The necessity of using active teaching methods in Trigonometry branch was determined.

2- It was determined that the use of peer teaching in Trigonometry branch increased the success of students and positively affected their attitudes towards mathematics.

The Research Responsibilities:

- To determine the psychological and pedagogical basis for increasing interest in mathematics through the use of peer instruction in the teaching of trigonometry in algebra;

- Development of a model for the effective use of the method of peer teaching in the study of trigonometry;
- Experimental proof of the growing interest in mathematics using the method of peer teaching in the teaching of trigonometry

The main idea of the research: The introduction of a method of peer teaching in the teaching of "Trigonometry" provides an increase in the level of progress in mathematical knowledge based on increasing students' interest in mathematics.

Sources of the Research

Constitution of the Republic of Kazakhstan, Law of the Republic of Kazakhstan "On Education", State Program of Education Development in the Republic of Kazakhstan for 2011-2021, works of philosophers, psychologists, teachers, methodologists, official documents in the field of education, compulsory educational standards, plans and programs.

Research methods

1. Peer instruction has a significant impact on the mathematics achievement of 9th class students.
2. Peer instruction has a significant impact on the attitude towards mathematics of 9th class students.
3. Gender differences have no significant impact on 9th class students' mathematics achievement and their attitude towards mathematics.

Research stages:

Stages I (2018-2019) - The research topic has been determined and the relevant literature has been analyzed. Studies have been done on the tests to be used in the research. A pilot study was conducted to create an achievement test in 9th-grade trigonometry. After the pilot study, analyzes were made and an achievement test was created. The attitude mathematics test and the evaluation form were determined.

Stages II (2019-2020) - The schools where the study will be conducted were interviewed and a presentation was made to the teachers who will participate in the research on peer education and how to pass the lessons. Implementation started in the third ninety of the school year. The first part of the thesis was created during the implementation.

Stages III (2020-2021) - Findings obtained during the study were analyzed. In the light of the results obtained, the second part of the thesis, the method part, was written and prepared as a source. Finally, the thesis has been prepared in accordance with the conditions.

Scientific novelty

- To improve student academic performance and to form a positive attitude to the method of teaching mathematics to students of the same age.
- The psychological and pedagogical basis of increasing interest in mathematics is determined by using peer teaching method in the teaching of trigonometry in algebra;
- Effective use of the method of peer teaching is demanded in the teaching of trigonometry;

- The proposed method is proved by an experimental practice.

Theoretical significance of the research consists in acquiring skills in the organization and technique of using peer instruction method.

The practical significance of the research is to study the features of using the peer instruction method in teaching Trigonometry, the results of the study can be used by teachers in working with secondary students.

The reliability of the research (accuracy, reliability)

This theoretical part of this research was conducted using both local and international articles as part of the literary sources. The practical and methodological bulk of the study was done by the author in collaboration with several volunteers who took part in the experimental research.

Approbation and implementation of the main results

The findings of this research have been confirmed both in theory and in practice in several schools and universities in Kazakhstan. Several articles have also been published both locally and internationally in the light of the findings of this study.

In the conclusion of the dissertation the hypotheses of the research were confirmed and their validity proven using both theoretical arguments from literary sources and from practical experimentation in classrooms. The results were collected and carefully analyzed using credible tests and final arguments put forward giving room for the likelihood of future research.

The methods used in the work are the analysis of educational and methodical literature, comparison, generalization of pedagogical experience on the use of computer algebra systems in school.

The theoretical and methodological basis of the dissertation was the work of scientists, mathematicians, physicists, economists, domestic and foreign authors on the issues under study.

Structure and content of the thesis:

The thesis consists of normative references, definitions, introduction, two chapters and conclusions, suggestions, reference list and appendices.

In the first section

1- Problems encountered in mathematics lessons taught with the traditional teaching method

2- Psychological and Pedagogical Problems Experienced by High School Students as a result of traditional education's failure to respond to students' achievements and attitudes towards mathematics.

3- The development of the peer instruction teaching method in the psychological and pedagogical context in mathematics teaching and methodological approaches to the problems of teaching mathematics and didactic principles of mathematics lesson using Peer Instruction were analyzed.

In the second section

1- The use of peer teaching in the mathematics lesson, its application in the lesson and the reaction of the students in the lesson where the peer teaching is applied were got.

2- The result of the Peer Teaching application in Experimental Study and the interpretation of the results together with the analysis of the results were obtained.

In conclusion section

The positive effect of using the peer teaching method in mathematics lessons on the academic success of the students was determined and the peer teaching created a nice atmosphere among the students in the lessons, as well as, the students' attitudes towards mathematics changed positively. There is a conclusion that mathematicians can apply the peer teaching method in their lessons