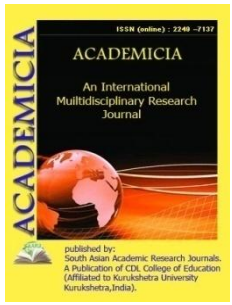
ACADEMICIA

ISSN: 2249-7137 Vol. 10 Issue 9, Sept 2020 Impact Factor: SJIF 2020 = 7.13

ACADEMICIA
An International Multidisciplinary Research Journal
(Double Blind Refereed & Reviewed International Journal)



DOI: 10.5958/2249-7137.2020.01064.2

INNOVATIVE TEACHING OF TECHNICAL SCIENCES IN HIGHER EDUCATION

Kholikov Kamoliddin Abdiganiyevich*; Sapaev Ibrokhim Bayramdurdiyevich**

*Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Tashkent, UZBEKISTAN

******Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Tashkent, UZBEKISTAN

ABSTRACT

The article presents the experience of implementing innovative teaching methods used in the teaching of technical sciences. It also reflects innovative forms of teaching that allow teachers to activate students 'cognitive activity. This article provides information on the use of innovative technologies in the teaching of technical sciences in universities.

KEYWORDS: *Interactive Form Of Teaching, Innovative Form Of Teaching Technical Sciences, Technical Textbooks, Multimedia Systems, Interactive Whiteboard , Increase Of Knowledge Activity, Efficiency Of Educational Process*

INTRODUCTION

Nowadays, at the current stage of modern student development , the ability to ensure the correct reception of information by the student , the study and mastery of technical sciences, is very important for the formation of motivation. Article 14 of the Law of the Republic of Uzbekistan "On Education" states that "higher education provides training for highly qualified specialists." Training of specialists with higher education is carried out in higher education institutions (universities, academies, institutes and other higher education institutions) on the basis of secondary special, vocational education. [1]

Education plays an important and critical role in shaping the skilled workforce on a global scale . For decades, the use of textbooks has been a traditional teaching method; however, the emergence and introduction of methods for assessing teaching effectiveness have found that most students do not master the course content to the expected level. As a result, many researchers are focusing on improving and developing existing teaching methods , as well as

introducing and experimenting with new teaching methods. Unfortunately, researchers have not been able to agree on the effectiveness of the new teaching methods ; so they require additional verification. To solve this problem, five innovative and effective methods of teaching in all technical sciences were selected (fracture room, game plan, design thinking / practical training, self-study research and social media) and in-depth analysis of their content. The advantages associated with each new teaching method were explored and information relevant to the teaching methods was identified and evaluated. The results showed that in 2000 and 2017, the self-study method and Social Media were written more in magazine articles than other teaching methods. Most of the researchers distributed questionnaires to gather the data needed to evaluate the accepted teaching methods. It was concluded that the use of independent teaching method improves students ' ability to research and think. In addition, the use of social media enhances effective communication between students. The results of this study can significantly help teachers, educators, and professors apply the most effective teaching methods based on their lesson goals.

Education is an important part of any society and it can make a great contribution to a country's economic growth. At a time when technology improvement and innovation are a priority, there are many opportunities for innovative teaching and learning methodologies. Traditional methods of teaching were mainly based on explaining the subject of the textbook to the teacher; the students were not active participants in the class. New teaching methods encourage students to take an active part in the lesson to stimulate curiosity and creativity. Mc Carthy and Anderson (2000) conducted research to study, analyze, and compare the results of students taught in traditional methods with students taught on the basis of active learning methodology. The results of the quizzes showed that students who were actively involved in reading had higher scores than students who were taught in the traditional way. More research is being conducted and several new methods are being experimentally introduced and applied to increase the efficiency and effectiveness of students. In this regard, several methods have been introduced and used to measure the effectiveness of the training methods implemented.

Over the past two decades, many researchers have tried to find a unique teaching method that can help all students learn effectively. However, most researchers agree that there is no one-size-fits-all teaching method suitable for all types of students of all ages and races . Several researchers also used different methods to evaluate the effectiveness of different teaching methods.5 The researchers introduced five new teaching methods: fracture room, design, thinking, self-study, and social media. . The aim of this study was to comprehensively review five new teaching methods published based on the existing literature between 2000 and 2017 and to provide an in-depth analysis of their approaches. Three steps have been taken to achieve these goals : the distribution of teaching methods used from 2000 to 2017 has been determined, and the methods of assessing the effectiveness of the five teaching methods identified in the last 17 years have been identified, and each of the indicated teaching methods identify learning objectives related to. The results of this research will significantly address student-related issues and help teachers and professors select the most effective teaching methods based on the learning objectives for their courses.

RESEARCH METHODOLOGY

These five new teaching methods to achieve the objectives of the research journal dedicated to articles, conference, materials, insurance licks and research reports identified and collected enough and that the number of journals to publish more seriously than other sources since it had to be removed, the authors decided to focus only on them.

Scientific and technological progress and the external environment are transforming modern enterprises into increasingly complex systems that require professionals. The solution to these problems largely depends on the content and technology of training future professionals in the higher education system , in particular, the teaching of technical sciences. The use of innovative technologies in technical sciences allows the selection of the necessary content and training manuals for the program, modern production requirements and the chosen specialty. A modern teacher needs to be competent, aware of the latest advances in education and technology, as well as motivate students. Shape the direction of the students with the necessary psychological and pedagogical aspects should be taken into consideration. Recent advances in technology and science have made a significant contribution to the understanding of the role and methods of using information and communication technologies, which should be used to successfully engage young people in the learning process and effectively and truly expand their interest in the technical discipline being studied causing changes. Technical science, technical manuals and taught (DARK) will speed up the transfer of information and interactive forms of education material, illustrations expands, creates a problematic situation, student research activities, Reader contributions improves the foundation, forms learning motivation, individualizes and differentiates the learning process - the whole course of lectures and serves as a top-level audience that will ensure the integrity and completeness of it by the method of providing large amounts of theoretical material. When giving a lecture, it is recommended to conduct binary or web binary lectures with the participation of a teacher and a highly qualified production specialist . Lectures with planned errors are very effective. This form of lesson organization attracts the attention of students throughout the lesson because they have to look for the teacher’s mistakes. It is also very important to use animation and video materials in the lectures; it will be easier to master the material visually. However, the lecture teaches passive perception of the material being studied. To prevent this, direct communication between students and teachers is effectively used, for example, in the form of a press conference. When reading lectures on technical sciences, an innovative method of teaching using a multimedia system - an interactive whiteboard (ID) is used to increase interest and learn new materials. - The most common form of practical training is to work in small groups of 5-7 people. The groups are given tasks to solve. Tasks are designed for 5-10 minutes, and each student should have a deep understanding of the solution to this problem. Students who complete the work first will be able to help the rest of their peers using the peer-to-peer approach. As well as executing a virtual model of the task to create a detachable, LAB VIEW, Logic or Crocodile virtual environment, such as l If you can use. [2] - Make effective use of Internet resources, brainstorming technologies, and invention problem-solving theory when implementing design. While completing the assignment, students learn to look for material for work, express their opinions intelligently, listen to the interlocutor, find several types of solutions to the assignment, use technical manuals, and go outside the classroom ; identify

what cannot be seen with the naked eye, simulate any situation, discuss y solution options, and select the most optimal y solution.

When conducting laboratory work on the subject "Electronics and Circuit Engineering " students are given the following tasks: TTL and CMOS circuits are set to LE 2I-NOT, in small groups students should study the methodical material, colleague on physical models, measurement get the results, build. I - V character graphs and transfer properties of elements, perform virtual laboratory work, lead to corrosion of contacts and compare the parameters of graphs. To complete the work, students are formed, small groups work in a team: 1st student - collects circuits for TTL , 2nd student - assembles the chain of contacts in CMOS No. 3 - 4th student deletes the results of both periods - 5th student Creates a CVC graph in the TTL circuit. 6 - students - CMOS schemes I - V form characteristic graphics , 7 students - virtual labs working with the Internet looking for this circuit materials . The team works together because if it doesn't work, the result of the work won't be at least one reference. The essence of the education debate is to exchange ideas on how to solve a particular problem. An important task of discussion is to constantly stimulate and support the student's learning and cognitive activity, which helps to acquire new skills as students are offered several ways to achieve the result. [4] The advantages of TSM in the technical field are: 1) it has a strong emotional impact; 2) allows to reflect a process or event in its development, dynamics; 3) evokes different sensations (world of sounds and colors); 4) provides a high emotional tone and, as a rule, increases efficiency; 5) reduce the time required by the teacher. The use of innovative teaching methods provides effective results in the learning process. Innovative technologies in science and technology can be combined with each other. Each teacher of the university has more than 20-25 interactive methods of working with students. It is not necessary to know all the available interactive methods. It is very important for the teacher to use the methods that TSM uses. The use of TSM in technical sciences activates the transmission of information, expands illustrative material, creates problem situations, organizes the student's search activities, improves the emotional basis of learning, forms learning motivation, individualizes the learning process and differs. [5] The advantages of TSM in the technical fields are: 1) it has a strong emotional impact; 2) allows to reflect a process or event in its development, dynamics; 3) evokes different sensations (world of sounds and colors); 4) provides a high emotional tone and, as a rule, increases efficiency; 5) reduce the cost of time required by the teacher.

Didactic requirements for the preparation of the lesson using modern technical manuals: 1) analysis of the objectives of the lesson, its content and the logic of studying the material; 2) highlight the key elements that the student needs to learn; 3) determines at what stage and for what purposes the technical training manuals should be used; 4) choose the best technical training manuals; 5) identification of methods and techniques that provide students' cognitive activity, the formation of tasks. Modern computers allow you to achieve a variety of didactic goals - to organize demonstrations of the studied topic, event or process, to test the knowledge of the audience using tests, to simulate the operation of the device in different situations (including emergencies) , etc. [6]. Analysis of the results of lessons conducted using innovative technologies shows that: - the student's interest in science; - activation of students; - teamwork skills; The use of innovative technologies in the educational process is a necessary part of modern student education. The teacher achieves the effectiveness of mastering the teaching material when working with interactive and innovative technologies. It should be borne in mind

that ultra-modern TSS, if they do not develop the necessary methodological training and didactic materials, violate ergonomic and psychological-pedagogical requirements, unreasonably expand the scope of application, they will not give the desired effect if used accidentally. Innovative teaching methods help to train quality professionals who can apply the acquired knowledge in enterprises.

CONCLUSION

Many researchers are working to maximize learning outcomes while benefiting students from learning and learning outcomes. In journal articles, this study selected five new and effective teaching methods (Fliled Classroom, Gamification, Design Thinking / Case Study, Independent Learning, and Social Media) that can be applied in all engineering sciences . The distribution of data collection types was determined and compared with five teaching methods. The results showed that many studies on independent teaching methods have been conducted because free information is open and accessible to all . It was also concluded that many researchers prefer to use questionnaires / questionnaires as a means of gathering information from many respondents. The results showed that the use of independent teaching method improves students 'research ability and thinking ability. This study also concluded that the use of teaching methods on social media enhances effective communication between students. Choosing the most effective and appropriate teaching method requires a lot of knowledge and involves many factors. This research will help teachers choose teaching methods that are appropriate to the learning objectives of the lessons to meet the needs and wants of the students while benefiting the students and teachers.

REFERENCES

1. Usmonov, B. Sh. Innovative methods of teaching technical sciences / B. Sh. Usmonov, G.X.Jurayeva, A.A. Yadgarova. - Text: direct // Tech . Technology. Engineering. - 2017. - № 2 (4). - PP 10-13. - URL: https://moluch.ru/th/8/archive/57/2067/ (access date: 16.07.2020).
2. Aripov X K., Abdullaev AM, Alimova NB, Bustanov X., Obedkov E., Toshmatov Sh. Electronics - T .: Science and Technology, 2011.
3. Muslimova NA, and b. Educational-methodical manual "Innovative educational technologies". -T .: TSPU named after Nizami, 2015
4. Rizieva D., Usmonbaeva M., Goligova Z. "Alpha methods: magic and location" -methods.-T .: TSPU named after Nizami, 2015
5. Arsenyeva ES, Kogosova Yu. P., Metzler AA, Tomilina ME "Experience in the use of interactive forms of teaching in the teaching of technical sciences" Concept-2016.-№ 02-ART16037
6. Juraeva GX Innovative methods of teaching radio engineering // Young scientist. - 2016. - № 20. PP 151-153.