



CREATIVE ASPECTS OF THE EDUCATOR IN THE PROCESS OF TEACHING THE SUBJECT OF ALTERNATIVE ENERGY SOURCES

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ABSTRACT

The article under discussion presents the results of experimental research and a presentation of scientific research carried out to increase the creativity of teachers working in higher educational and professional educational institutions. Influence on improving the quality of education; a high degree of teacher's creativity.

KEY WORDS: *technique, teacher, technology, education, creativity, skills, energy, solar cells, academic performance, student.*

INTRODUCTION

Despite the fact that in technical higher and vocational secondary special educational institutions, classes are organized, the level of knowledge of students is not at the required level, which has attracted the attention of education officials and authority of our country [1-3]. The fact that the level of knowledge does not keep pace with the times, most of the old materials are studied and the level of mastery is maintained in extremely dangerous situations, which requires the development of measures to address these shortcomings, therefore it is a serious approach to the educational system. The urgency of this issue can be explained by the following reasons. First of all, the role of each

country on the world stage is determined by its energy independence. Many years of observation and analysis show that the wars and political games taking place on the planet are mainly due to the fact that countries with abundant natural energy resources do not agree to share among the major developed countries. These conclusions are confirmed by armed majorities in countries such as Iran, Syria and Afghanistan. In addition, in a country with a high share of scientific personnel, the development of techniques and technologies is accelerating, they are among the largest countries with megacities, their prestige is growing. Finally, the poor quality of education leads to disruptions in the most important energy systems (gas, electricity) as a result of



ignorant management of the operation of existing technical and technological equipment in the country, leading to public discontent and lack of support for public policy. The most unfortunate thing is that the living standards of the population are deteriorating and their health is deteriorating.

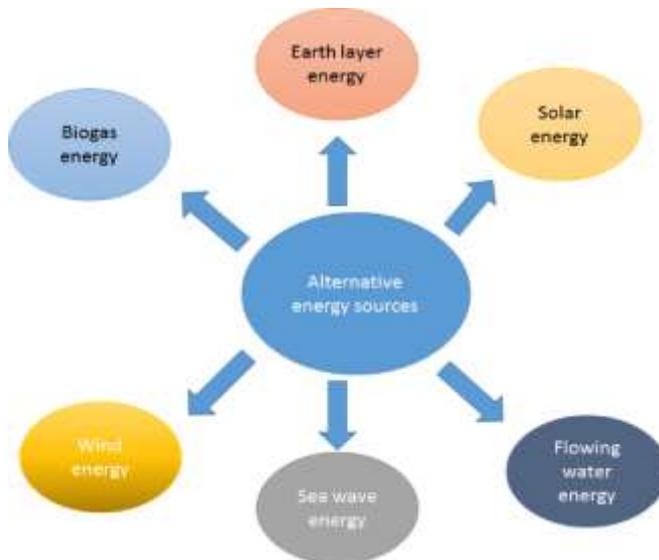
However, there are many challenges in achieving results that eliminate such negative consequences. The main of them is the problem in the field of education. Because there are almost no methods of teaching technical sciences to young people with an interactive and innovative character of teaching. Even if there are, they constitute a small amount. This is due to the fact that the majority of teaching staff are teachers of pedagogical courses, which modernize the teaching process and provide in-service training courses for teachers. This suggests that they cannot recommend any practical good-performing methods for conducting lessons, ranging from the use of technical literature. If we also take into account the large number of technical and natural sciences, then the idea that a separate method should be developed for each science is also valid. No matter how much these conclusions are debated and challenged, no matter how much they are challenged, they will still be useful.

Based on the above ideas and considerations, this article shows that the focus is on key aspects of teaching the science of alternative energy sources in technical universities and vocational education institutions. It is advisable for educators consisting of engineers and technicians to get acquainted with the results of the research, which is written as a guide, when students are admitted to the auditorium without any pedagogical and teaching skills.

FUNDAMENTALS OF TEACHING THE SCIENCE OF ALTERNATIVE ENERGY SOURCES

Before embarking on the study and teaching of science on alternative energy sources, the essence of the content of science should not only be understood by the educator, but, of course, analyzed and taught step by step [4] as there are types and classes of alternative energy sources. If the work begins by explaining the differences between them, and then is taught by taking some kind of one of these species, it will help the students to define and organize their imaginations. Alternative energy sources are divided into species in Figure 1, and each species class has its own characteristics. For example, solar energy is the strongest and most powerful source, and the main structure in obtaining electricity from it is solar cells (SC) made of semiconductor material. The student will not be able to master the structure of SCs until he or she knows the rules of operation. The rule of operation of SC is based on the laws of physics. This is where a science teacher should be able to demonstrate his creativity as correct understanding is about imagination. In imagining correctly, the teacher must act as an artist with skillful creative development. [5,6]. The authors of the work presented a new method of teaching and learning, the "Electronic Swimming Method" (ESM), which is used to study the process of converting SC from light energy into electrical energy, where the student converts an imaginary small particle into an electron. It is recommended to dive into a solid body volume. It explains which electrons "travel" through the energy levels that represent the working motion of electrons, which electrons contribute to the formation of an electric current, and which electrons cannot do so. The result can be good if the physical processes are also explained by the objects in action, or by other actions.

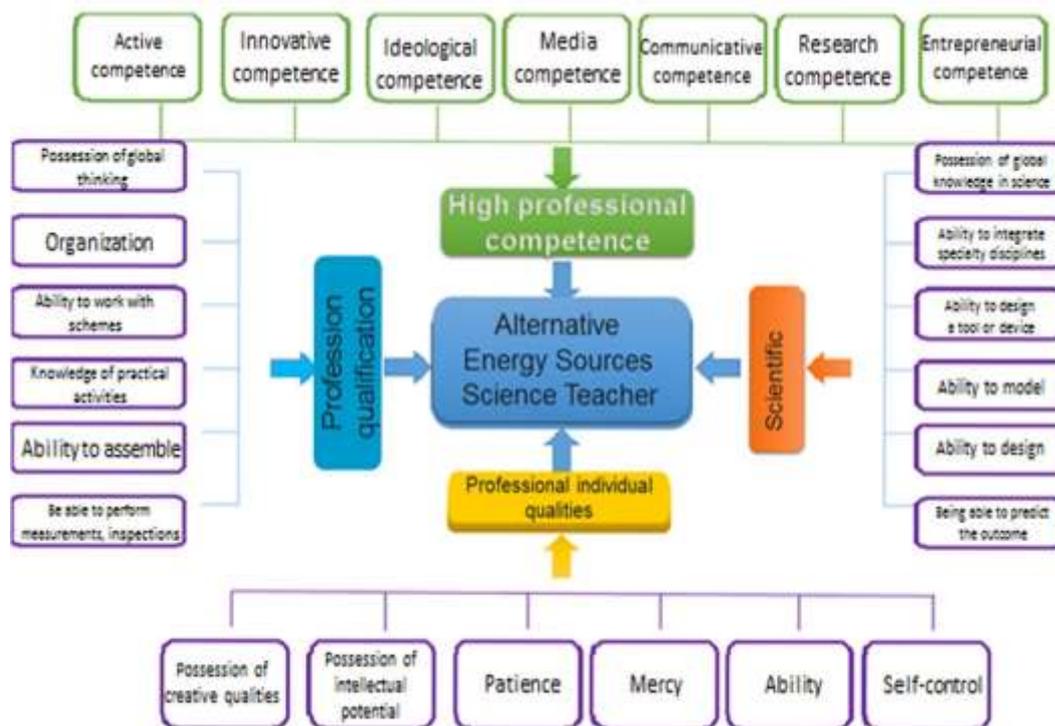
Figure 1. Types of alternative energy sources.



In the subsequent stages, the structure, materials, geometric shapes of solar elements and, of course, their strength in the transition to auxiliary

equipment, their long-term positive characteristics retention factors should be explained. In this case, the scientificity of the teacher is important (Figure 2).

Figure 2. Aspects showing the creativity of a subject teacher.





Because when using the source, which is the basis of the subject under study, explaining what solutions the scientists of which country have found, the concept of "cause and effect" is introduced, and the character of the researcher is formed. This, in turn, creates the ability to rationalize (AR). The advantage of the formation of AR in the student is that he can also overcome the continuity of work due to his ingenuity, when in the process of working with technical tools and equipment in production, they are likely to encounter many situations, such as breakdowns and failures.

The subject of solar energy, in addition to teaching the structure and working principle of solar cells, considers it permissible to acquaint them with additional equipment. For example, solar concentrators, cooling systems, measuring and control devices, inverters that convert alternating current into alternating current, energy distribution devices, and so on.

Unlike teachers of humanities, or educators, it is necessary to organize the teaching process in the training of engineering specialists in such a way that the quality of the results of the lesson allows the learner not only to understand theoretical knowledge at the end of the lesson, but also to work with tools. collection and experimentation skills should also be assessed as they emerge. This does not give the same result for all students. It is for these moments that the kindness and patience of the educator guarantees that the result will be good. Another important aspect is that the educator must be a good psychologist. However, in technical universities, pedagogy and psychology are sometimes taught for a few hours, and sometimes not at all. But it is not possible without taking into account the mental state of the learner. This is where the teacher is required to be skilled at sensing the student's mental state. Another quality not listed in Figure 2 above is a necessary quality for a teacher in a technical educational

institution. This is a precaution. Because most of the training involves studying machines and mechanisms that are dangerous to human life, such as electricity, heavy equipment, rotary gears, multiton presses. The student who attends the first session does not realize or understand that he or she is in danger. Therefore, the educator should not be limited to writing and explaining absolute theoretical formulas, it should become a basic law. It is worthwhile to link the nature of caution with media competence [7,8]. This is because the internet, which is considered a social network, has many multimedia movies, pictures, and instructions based on safety rules. In this way, moving ahead of their students shows that the teacher is highly competent. After all, today's young people are more likely to interact with information that is useless from the internet. Media competence is essential in finding training materials that are very useful for learning from this network, teaching and searching for ways to use them, and teaching them how to apply.

EXPERIMENTAL VERIFICATION AND ANALYSIS OF RESULTS

In order to conduct experimental research to study how the teacher's response to the above requirements affects the level of mastery in the educational process, the subject "Alternative energy sources and devices based on them" was taken for students "Electronics and Microelectronics" majoring in Fergana Polytechnic Institute. Students in two parallel groups were assigned a teacher with two different experiences. The first teacher is a young specialist with three years of pedagogical experience, and the second is one of the authors of this article, a researcher who conducts research on pedagogical activities in technical schools. The results of the training and supervision are presented in Table 1.

Table 1. The results of the experiment.

No	Indicators	1-group	2- group
1.	The number of students	25	27
2.	Attendance after the first five sessions	17	27
3.	Attendance after the second five sessions	15	26
4.	Attendance after the third five sessions	13	27
5.	Assimilation rate in the current assessment (%)	13	25
6.	Assimilation rate in the mid-term assessment (%)	16	24
7.	Assimilation rate in the final assessment (%)	15	24
8.	The number of students who have developed a practical skill	1	19
9.	Number of students who have fully mastered (at an "excellent" grade)	1	12
	Total mastery index (%)	60	88,8



From the data in the table 1, it can be seen that conducting a lesson without enriching it creatively leads to a loss of interest in the student, or pupil, and a lack of enthusiasm for the lesson. As a result, mastery decreases sharply. It was found that another quality must be present in the teacher when conducting experiments. It is principle character of the teacher. It is important for the teacher to take a principled approach both in preparation for the lesson and in making lesson plans and passing them in the allotted hours. Because the result of this is directly visible in the attendance of students. Observations have found that the only practical skill is present in a student who has been interested in technology since childhood. So growth is almost non-existent. In fact, the current situation in some technical educational institutions has been confirmed. There was no decrease in attendance in group 2 students. When students' opinions are studied, it is explained that they had information about the teacher's qualities and level of knowledge before the lesson, and that the students were expecting and interested at the lesson. A student who was once unable to attend class explained the reason for being absent because of a family problem.

The most effective way to determine a student's level of knowledge of a topic covered is to ask him or her to share his or her understanding. Recently, in connection with the introduction of the transition to credit-modular education in educational institutions, a second experiment was conducted in a small master's group. The topics were distributed to 15 students in order to increase the level of independent preparation of master's students and the possibility of conducting classes in educational institutions. Then they were asked to prepare a report using the literature. They were asked to prepare a material in the form of a presentation and demonstrate their knowledge.

Figure 3. A graph showing that the description of students' independent work is related to the database (level of knowledge).

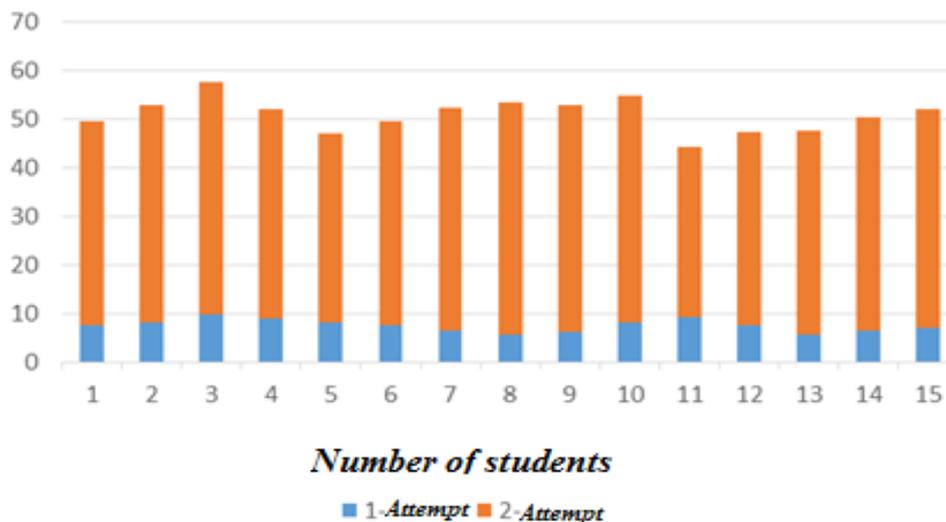




Figure 3 shows a graph of the duration of the lectures given by these 15 students as a result of their independent preparation. The blue columns 1 in Figure 3 (located at the bottom of the drawing) show the duration of the lectures they had prepared for the first time. Apparently, the duration of the lecture was on average 7-10 minutes, which was short, the information was incomplete and showed that the student did not know what else he could talk about. The teacher explained and pointed out the shortcomings. At the same time, the lack of use of the text of the lecture, the need to use not only Uzbek, but also literature in foreign languages (Russian and English), methods of using videos and pictures, diagrams posted on the Internet were taught.

During the speech, it was explained that there should not be unnecessary words in the speech, some words should not be repeated unreasonably several times, diction, intonation and emotional statements, the importance of designs in the presentation material. The second orange columns of Figure 3 (which form the upper part of the drawing) show the duration of the lectures prepared by these students on the basis of the teacher's instructions on the second topic. Apparently, the result shows a dramatic change for the better. This option evoked confidence in the speaker, a desire to throw new information into the audience's discussion, and a desire and aspiration to demonstrate that he was self-seeking.

CONCLUSION

Research work on the level of creativity of teachers working in the system of professional education has confirmed the importance of this indicator in the training of young professionals. It was confirmed that the teacher's inquisitiveness, creative approach to their profession leads to the deepening of students' knowledge, and the ability to work with technical means, the formation of practical skills in them. According to the results of scientific research, the most important method: the development of teaching methods of special importance for students in technical institutions proved that new pedagogical technologies must be taught in ways that correspond to the nature of specific sciences. To do this, it is advisable to apply the methods of qualified and experienced professors, analyze their results and apply in practice which showed effective results. As a result of the individual approach to the student, it was found that they are able to increase their performance, express their opinions and explain to another listener, even through independent training.

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