

THE ROLE OF THE EDUCATOR TO PROVOKE COGNITIVE ACTIVITY AND CREATIVITY IN STUDENTS IN THE PROCESS OF TECHNOLOGICAL TRAINING

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Abstract: Certain standards and expected results for the mastering of particular knowledge and skills for each class are set in the curricula. Appropriate teaching strategies are recommended as well. Basic guidelines to achieve the expected results are set out within the content of textbooks. However, the didactic tools with which teachers can provoke and develop cognitive and practical activity of students are not specified and this often makes it difficult for them. The provision of "practical and workable conditions for selection of activity" is set as a priority in the current curricula for technological training, but only the pedagogical competence of the teacher can tell them how to make the student "to show initiative," "to understand the need for organization and control of the activities," "to propose and discuss ideas and solutions in practical work," "to encourage 'discovery learning'."

The activity of the individual is a key driver of human progress. Therefore it is necessary to create conditions for its manifestation and development at a very early age. The textbook is one basis for implementation of the curriculum, consistent with the average intellectual level of the students. The role of the teacher is to select the correct ratio between reproductive and productive activities in compliance with the level of their class, as well as the type of teaching tools. In this regard, it is necessary first to increase the proportion of inciting information in the learning process at the expense of the ascertaining one, to ensure the active role of the student in the mastering of knowledge and skills. The role of the interactive teaching methods that provoke students mental activity is indisputable. Interest and motivation are of utmost importance to the activity of the children. The specifics of age suggests offering of curious, up-to-date information on the latest technical developments, as well as its adequate visualization. Solving problems from reality, the experimental work, the IT environment are all factors that promote the activity and creativity of students. It is therefore necessary to find a place in teaching methodology. The project training as a form of implementation of educational activities in the course of which knowledge is rationalized, applied in practice and materialized in a significant product, is an opportunity for teachers to put students in an active position as the degree of interest and motivation increases in these conditions. The scale of the project involves interdisciplinary interaction.

Keywords: cognitive activity, creativity, technological training, forms of organization, learning process.

1. INTRODUCTION

Certain standards and expected results for the mastering of particular knowledge and skills for each class are set in the curricula. Appropriate teaching strategies are recommended as well. Basic guidelines to achieve the expected results are set out within the content of textbooks. However, the didactic tools with which teachers can provoke and develop cognitive and practical activity of students are not specified and this often makes it difficult for them.

The provision of "practical and workable conditions for selection of activity" is set as a priority in the current curricula for technological training, but only the pedagogical competence of the teacher can tell them how to make the student "show initiative," "understand the need for organization and control of the activities," "propose and discuss ideas and solutions in practical work," "encourage 'discovery learning'" ²⁵⁹¹.

¹ Ministry of Education and Science, Curricula of Technology and Entrepreneurship for 1st, 2nd, and 3rd grades. Sofia, 2016.

The activity of the individual is a key driver of human progress. Therefore it is necessary to create conditions for its manifestation and development at a very early age. The initial stage of the primary school level is very important for the personal development in this direction because:

- During this age children are being educated and are able to use written information sources, including the Internet, which is associated with learning the basics of information technology;
- The mental processes are being developed – mainly knowledge and skills are accumulated during the first two years, then conditions are created for perceptible manifestation and development of mental operations - analysis, synthesis, generalization and others. This enables better implementation of the productive strategies of training and development of logical thinking.
- The interest in learning activities and exploring the world, especially towards the achievements in the field of engineering and technology are relatively high during this period of personal development.
- There are conditions for implementing the project training on interdisciplinary base, where knowledge from different fields make sense and can be applied in practical and applied aspects.

The textbook is one basis for implementation of the curriculum, consistent with the average intellectual level of the students. The role of the teacher is to assess the level of their class and to select the correct ratio between reproductive and productive activities, as well as the possibility to offer tasks with cognitive nature. It is particularly important for them to be aware of a variety of teaching tools for implementing the productive strategies in training.

2. THESIS STATEMENT

In this regard, it is necessary first to increase the proportion of inciting information in the learning process at the expense of the ascertaining one, to ensure the active role of the student in the mastering of new knowledge. It is usually associated with the presentation of material in which there is a shortage of certain information or missing logical links underlying a concept. As a result of activation of mental activity of students, the missing components are determined and a solution of the problem is found. Usually the information block in textbooks presents new knowledge rather concisely and in finished form. In rare cases, there are questions related to photographs for comparison and analysis of situations. Therefore when preparing lessons, the educator should consider how and to what extent the educational content can be enriched with current and curious information or “mix” the elements of the information puzzle so that students can participate in finding out the basic properties, regularities and special features of the objects considered. I believe that a need for a new model of teaching has arisen, which focuses on proactive-practical training, which is based on interaction and problem solving and case studies from real life. Extremely effective in this direction are the interactive methods that are associated with cognitive actions: analysis, synthesis, generalization, classification, modeling, and others.

87.5% of the surveyed 32 teachers in the initial stage of the primary school level admit to using mainly traditional methods in the process of technological training: a narrative, explanation, demonstration. Interactive methods are used only by four of them who have collaborated with professors from the University of Shumen.

Suitable interactive methods by which creative technical thinking is provoked and developed and namely - skills for modeling and designing, related to innovation, although with subjective nature, are the brainstorming method, the reverse brainstorming method, the method of focal objects, etc. The first method allows each student to participate in solving a particular technical problem. It is very important here to involve those children who feel uneasy and reluctant to share their ideas in front of everybody. Therefore, the teachers are supposed to consider their method implementation strategy well, especially the process of generating ideas. To avoid uncertainty and anxiety among some members of the team, it is appropriate to distribute sheets of paper in the first stage of each session, where the suggestions can be written, sketched or drawn. If the problem at hand is related to improvement, completion, re-construction or design of a technical object, it is desirable that the main graphic image on which students are supposed to work is contained within the sheets of paper distributed among the participant. Thus, each student without worry may write their solving and give it to the teacher. The next stage is to rank the suggested ideas by the teacher bringing them together by similarity. As a result we have several groups made up of similar ideas. During discussing it is good to stimulate positive attitude by seeking not only logical and rational decisions, but paying attention to other unconventional ideas that could lead to interesting results. These may be observations with the reverse brainstorming method where disadvantages of the object in question are sought in order to improve it.

The implementation of these methods can be done at another level as well - in practical and applied aspect related to the preparation of a specific project or model of the object. Projects can be discussed based on pre-specified criteria and testing of the model can demonstrate its applicability, which makes the assessment objective.

The method of focal objects implies an active mental activity in a high degree, personal attitude and act of imagination by setting parameters in a fairly wide range. Borrowing ideas from natural objects to create innovative

technical solutions is faced with interest and enthusiasm by the students. With this method they arm themselves with an unusual approach to design and construct objects, and the results are impressive. The ability of the teacher to select appropriate “focus” and “auxiliary” objects according to the level of knowledge and interests of children plays a key role in the successful implementation of the proposed creative task. The implementation of both the supporting and the preceding cross-curricular links with subjects related to the study of nature is required. The first stage of the method includes marking out of “auxiliary” objects - plants, animals, from which ideas will be borrowed, so the teacher should comply with the level of the class - whether to use the situation to assimilate or build on lessons learned by the students of certain natural objects or if knowledge is at a high enough level - to propose new ones. In all cases the level of knowledge and interest should be assessed in order to maintain students cognitive activity.

Undoubtedly, interest and motivation largely determine the activity of the students. How else can the educator boost their interest and their attention to a desire to explore the world, to discover important things to establish similarities and differences, to offer their ideas? Except through interactive methods, the teacher can make a contribution in this direction by targeted enrichment of educational information with timely, interesting facts about the achievements in the field of engineering and technology. 93.75% of the surveyed teachers agree that students are impressed and excited by new technologies. Educators are clearly aware of this fact. 73.75% of the surveyed believe that the textbooks for 1st – 4th grades in Technology training do not offer sufficient information in content and volume on the latest achievements in science and technology. 43.75% sometimes supplement the basic information in the textbook, 25% - do this often, it is worrying that many of them - 31.25% do not have time for this.

The outlined statistics show the need to enrich information in textbooks. It is obvious that due to time constraints of teachers' training, this cannot be done every class, but it is an opportunity to involve students in active cognitive activity related to finding interesting facts and events in the field of innovative technical achievements of mankind. The product of research can be presented in various forms depending on the skills and interests of students.

Due to the ability of children of this age group to adopt better visualized information it is necessary for teachers to provide rich visualization of the material especially when it comes to modern technical achievements. The diversity of visual means and aesthetic value are paramount. Here, students can participate in school activities as finding and bringing photos, pictures, toys, magazines, albums, collections, presentations and others that illustrate or complement the topic of the particular class.

Information technologies have become an integral part of everyday life of modern man, including children. It is natural for them to be used by the teacher both in the educational process as a means of presenting information, summarizing and displaying, and to create conditions for students to use them in their practical application activity in technological training classes.

The interest of today's young people to computer and Internet technology is indisputable. Unfortunately, yet in many classrooms there are no conditions for the use of modern technology in the learning process. In urban schools there are usually one or two computer labs where upon request to the director or supervisor may be held a lesson in a certain subject, but in practice it almost does not happen. Primary school teachers admit that they have the necessary training to implement a class in Technology and Entrepreneurship in a computer lab. From 32 surveyed, only two have held one class and at that under the guidance of a professor from the University. The experiments held with graduate students to use information technology in the activity of students from third and fourth grades in Technological training classes show that it is possible for them to find a place in the learning process and these lessons are met with interest by them. The presentation of the Paint program proved to be successful among the fourth graders and its implementation in the design. Finding information on given websites is also appropriate if the topic is interesting for the students. For example, preparation for Christmas and New Year, robots, interesting buildings, pets and others.

Teachers recommend using the Internet especially in relation to finding suitable ideas for making products. By the several proposed models or techniques students should choose what they like. This form of active selection is also useful and stimulates their wits and ability to decide, to combine or complement the proposed solutions in technical or technological plan.

An electronic test could be used in the lessons when generalizing, systematizing and knowledge testing ².

2. Peicheva, Y., M. Viyachev, Electronic testing as a means of control and evaluation of knowledge in technological training in bilingual children. Scientific works of students from the Faculty of Education. University Press, Shumen, 2014.

. Visualized to the maximum or in an interactive mode, it is particularly interesting and useful for children who have difficulty with the language, with unstable attention, or whose level of knowledge is at a lower level.

55.93% of the 118 surveyed students share that almost every class they work on ready-made unfolds or paper elements and that they do not like this monotony. They prefer a variety of materials and activities.

Suggesting similar ideas into practical and applied aspect leads to more precise mastering of certain technological operations, but lowers interest. The ability to express their own opinion and to manifest personal attitude is formed when there are prerequisites for this. If during teaching the teacher adheres solely to the textbook, then students get used to this work stereotype and perform tasks verbatim. They are not able to assume that some of the proposed practical tasks can be changed. It is true that there are opportunities for creativity, but generally students take the educational content and tasks for granted and that they should not deviate from them. In this case there is no creative spirit and creative atmosphere that is more appropriate for the classes during which students are expected to reveal and develop creativity, their ability to choose, suggest and discover.

Experimental work has a place in Technological training classes and is met with great interest by children, but requires preparation to provide materials and resources as well as didactic resource held by teachers, so they avoid it. However, when it comes to material properties, strength and stability of the structure, reproduction and development of plants, experimental work is the best opportunity for students to take on the role of researchers and to conduct experiments that are the basis for active transformation of the data obtained in mental plan to make the appropriate findings and conclusions. Teachers recognize that in this field there is less knowledge and stick only to those ideas proposed in textbooks.

Project-based learning can be considered as an organizational form, in the conditions of which students are motivated to a greater degree for the realization of useful, meaningful activity and the final product is important, it can be presented and this increases self-confidence and self-esteem in children³.

3. CONCLUSION

In conclusion, I can summarize that a good teacher has to know the curriculum well and the opportunities for its implementation should be based not only on the selected textbook, but also on the global experience in the field of engineering and technology and last but not least - the possibility of didactic realization. When the teacher uses the textbook as a basis, not as a reference in the learning process more doors for learning could be open to students. They witness the creativity of their teacher who suggests interesting topics and original ideas for practical work other than those in the textbook. When students are enabled to offer or choose the object of their activities, or materials, techniques that they will use, this fact makes them feel relieved, significant, they learn to form their own stand and to defend it, develops their self-esteem. Thus, within them, following the example of their teacher, is formed active attitude towards the learning content, striving for knowledge and creativity.

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³ Peicheva, Y., Sn. Lazarova. The project as a didactic tool for the realization of the key competence "initiative and entrepreneurship" in first grade. 55th scientific conference with international participation RU / SU, 2016.