



Current Trends in the Methodology of Teaching Technical Subjects

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ABSTRACT The article is devoted to training students from Pedagogical Faculty of Technical University- Sliven in professional pedagogical activities. Training of students is conducted on the basis of Educational Program of using specially developed pedagogical models. Students are trained on the basis of different principles of education. The logical structure of the educational process helps students to get professional, social and informational competences to get ready for using their knowledge in future work.

At present one of the most important means of pedagogical sphere modification of our students is the creation and the realization of various social projects aimed at quality improvement of future teachers. Current trends to improve training leave considerable space of self-cognition of learners. In the training of students in technical subjects this method is of particular importance. One of the main objectives in teaching methodology course is for students to learn to work independently with documentation of various software products. Future teachers must learn to group the material meaningful to detect reference points in the material. When working with documentation software is better to do an initial review of the material to separate the main stages and sequence of the studied sites.

The systematic approach is used for their formation.

The realization of systematic approach in this research is based upon the following principles: 1. Integrity and hierarchy of a structure gives opportunity to consider the system as a whole and same time as a subsystem for the previous levels of pedagogical education of our students.

2. Structuralism – allowing the analysis of the elements of the system and their interconnections in organizational structure of their practice.

3. Systematization - the property of the process to have all properties of the system. The given approaches allow to select properties of the future teachers training process. There are many methods of learning. We will mention some of them, but the most important are the new trends that are a compilation of all the knowledge in the area of pedagogical tools:

- **Discovery learning**

This kind of learning used to be associated with searching for information in a library. Students came to the library, searched for literature and discovered solutions to solve an authentic problem. Nowadays, with the use of the Internet, a lot of searching is done on the Web. Discovery learning is also defined as a highly self-directed learning form calls for a multiplicity of perspectives so that learners have a full range of options from which to construct their own knowledge. The instructor provides coaching or scaffolding to assist students in their discovery, but he/she would not overly direct the learning process. This also relates to the choices that the learners make with regards to their learning routes as well as their place and pace of learning. The learners often use a 'self-study' way in combination with discovery learning. This type of learning is mostly designed for individual students and focuses on reading. Assessment can be self-organized

via Web-based tests and communication with other students and instructors.

- **Learning by doing**

Learning by doing is a kind of a 'hands-on experience', so it's a very practical form of learning. This kind of learning is often adopted in science studies where students gain their knowledge in laboratories. They practice their skills and test their knowledge in a very practical setting. With the use of the Web, the practical settings are also offered in online-learning environments. The students can do the simulations in the online environment and write their knowledge, questions and critique and can get feedback from a lot of people. But practicing things on a screen isn't practical enough. The 'learning by doing' pedagogy is the most effective in a traditional setting where students can create their own things. The writing and critiquing part, is of course very effective in an online-learning setting because a lot of students and experts have access to give and get feedback.

- **Learning through discussion and debate**

The effectiveness of this kind of learning depends most on the context factors, like the group size and the role of the instructor. In the past, discussions and debates were organized in real settings with real people. The most effective learning outcomes were gained in a small class with an effective instructor. Nowadays, the discussions and debates are very popular because they are used in online environments. This kind of learning has become very effective because of using Web technology in educational settings. There's a lot of interaction involved in this kind of learning, and this is very effective. Students can use the discussion part to chat with each other, but also to share documents. They can communicate and collaborate with each other in a very flexible way.

Monitoring is an active form of sensory knowledge, with the extensive application. It is held under the guidance of the teacher in monitoring lessons, self-study and preparation of lessons in a real school environment. There are different types of observations: spontaneous, descriptive, systematically organized, self-led by the teacher. Organized monitoring consists of distinct stages:

- Preparation - provides favorable conditions for adopting the characteristics and properties of the observed processes and objects; Approach to signs of external perception and understanding of the essential connections and relationships;
- Requirement for formulating results from the observations;

The training in methodology of observation can be applied

in various forms. Observation in the study of the material that the student will be taught in class, monitoring the lessons taught by leading teachers, monitoring student behavior in class. The importance of training in teaching methodology have direct supervision, school experiments and study of documents.

Communicative ability, the existence of a complex system of communication with students is very important for the realization of engineers-teachers.

The process of preparing future teachers for social activities is a system presented as a system in the structure of higher professional education. This structure in its turn is the sub-structure of many relations system.

Dependence of the future teachers training process upon the structure of schools and the possibility of active practice there. During the research social order analysis was given to the process of future pedagogical training submitted of modern requirements of schools to professional, social and informational competences. Cross-examination showed that future teachers have formed universal professional competences. But market demands of the social order and rapid reorganizing processes in social policy of our state needs specialists who will effectively fulfill positive social activities by means of their profession.

Here of particular importance is the application of active approach in which students set goals for the study of a topic in the specialized press or research documents on the Internet. In this case, the development of terms of reference for a study should include:

- Topic;
- Main issues that need to be answered in the study;
- Sources of information;
- Rules for the description of the documents;
- Search keywords on the internet.

In the process of the training the practical activities increase, students are increasingly studying acting. Acquiring knowledge should be integrated with the master's ability to act. Knowledge must be accompanied by practical skills and habits. This is particularly true for the training in technical subjects.

A certain action is repeated consciously by exercises in the goal to develop skills and habits according to a standard. Exercises are used to reinforce the knowledge, the formation of skills and habits to develop the creativity of students. If we want to prepare good teachers in technical and engineering disciplines it is not enough to introduce them to books teaching methodology. It is not enough to read something to learn how to do it. It is not enough to be able to repeat and reproduce theories and prescriptions of good teaching. We must demonstrate proficiency in a simulated situation in a context that resembles situations that future teachers will face in their practice in school. Before they participate in classes and teaching practice the student is placed in a "situation" even classes in methodology through the use of modern technical disciplines. The concept of creating training sites took seriously advocated by methodologists over the last decade. This method gets into effective technical progress and changes occurring in the development of theories of teaching and learning. Modern learning environment is characterized by the following elements:

- Diversity of teaching styles (Single lesson could be taught in different ways and for different subjects is preferred methods). Diverse sources of learning (experience, supervised by professor studying hypertext, simulation and others. Use of rich interface allowing direct manipulation and more. Use of artificial intelligence techniques to integrate experts and professors that help

solve problems and allow the integration of pedagogical analysis. All the above mentioned trends in the modernization of teaching methods of teaching technical subjects are used in the design of training sites for placement of future teachers or instructors in a simulated environment provoking application of knowledge and skills acquired at university. We distinguish two approaches for training by site:

- Approach focused on the study of specific problems in the educational site.
- Teaching approach - based on material provided by experts, concerns or specific material to absorb or so for pedagogical research.

These two approaches are based on different theories concerning training. In first approach this is constructivism, in teaching - the socio-cultural. Our opinion is that these theories are not mutually exclusive, but clarified, each from a different angle, the complex process of learning. These theories are very mixed, but almost all are helpful in creating such a site of good practice in the training of teachers in technical subjects. Here are some of our key ideas in the field:

- Training in a specialty must take place under optimum conditions (behaviorism); The training is associated with actively solve complex tasks and problems and address the integration and accumulation of new knowledge Training is limited to cognitive human abilities (cognitive psychology);

Here is a summary of what qualities should include the new educational approach:

1. The learner should have an active role in the process;
2. The location methods and tools of the training should create a unified and rich environment for learning;
3. Environment must be tailored to the capabilities of the learner. It should neither under nor over its level. He must not be discouraged or lose interest in the process; The approach must include mentors and experts on the issues that are studied. Otherwise you have to provide support beyond the site, which complicates the achievement of objectives.
- The role of the teacher is to lead and educate the learner. Exercise - Monitoring shall ensure that the process goes smoothly and student progress in learning. This role can be played by the teacher to the learner self-controlled or performed by a computer program that tests and evaluates knowledge.
- Colleagues also contribute to improve the quality and speed of learning . Discussions are of great importance to clarify the concepts, for example.
- The course materials contain all the information which must be made available to students (statistics, practical work). Computer that can be hyper media scientific research, methodological developments and tasks, simulations, interactive problem solving.
- External sources of information affects all who are not directly available to students (libraries, periodicals).
- "Working tools" are all those who support the learning process, but does not match the training material (calculators, pencils, pens, paper). Among the whole set of facilities especially growing and significant role of the computer most - especially in areas which complement the role of the teacher and provide training material for a new type.

Tasks that are beyond the power of memory: all kinds of calculations, scientific information and activities that would not be possible otherwise. This is not specific and unique to the training. This „artificial laboratory“ is used in many areas of life.

"Medium education" - almost identical to the functional plan,

this program can be used for the development of cognitive abilities and knowledge. In this case we use the program as a "intellectual prosthesis."

"Artificial intelligence" is different from the traditional informatics. It helps to look at the computer as a general support unit for carrying out certain activities.

Discussed above, several elements are enough to understand that the placement of students in a learning environment (useful and effective) is not an easy task. Another conclusion is that not every student graduated with good results, is doing well in practice. If we want to prepare students for good teachers in technical subjects must train them well in practice and when it is impossible to „simulate" so that there is an "average" well suited for acquiring practical skills.

In order to improve the quality of training and the readiness of future teachers to deal in a real environment must change some strategies in their preparation. To improve the level of competence with which they leave the university. Trivial and banal, but we can contribute to this new information realities.

It is more than clear that a new teacher can not be competent in all areas. It can be trained to use well all methods and tools to assist in teaching and making pedagogical decisions. Use of programs, websites, information from the Internet will contribute to deal in an uncertain situation and to choose the right approach. We have to do what is necessary in order for students to deal with solving complex issues in the pedagogical reality. For this purpose, purpose-built training sites are crucial. There with the help of interactive exercises, they lose nothing. They can repeat training scenarios to implement different solutions to reach the right approach to looking at the "mirror".

Problems related to the efficiency in higher education are bilateral. On the one hand affect the strategies and approaches of students. On the other hand there are those of the teachers . The balance of the meeting of the participants in the educational process is complex and hotly debated process whose main goal is quality of university education and its continuous updating and upgrading to current technological realities.

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