Training Mechanics In The Preparation of Teachers of Engineering, Technology and Entrepreneurship

Tsvetana Kostadinova Antipesheva

Abstract - In this paper are considered some basic pedagogical issues related to technical training of educators. The suggestion is how much they will study mechanics and how to teach the knowledge. It is displayed a formula and a scheme which illustrates the material.

Keywords – training, mechanics

I. INTRODUCTION

The quality of education is a crucial factor in the qualification of each person. On the other hand the level of education and skills determine the level of productivity and hence determine the subsequent opportunities for the labor market. In this vein, education began to play a key role in society. As a global concept approve the idea of integral education. It could be said that the twentieth century was the century of differentiation of Sciences.

Their development resulted in a large number of new research results and discoveries. Increased influence of science in society and its application for peaceful purposes. The new XXI century seems to be the century of integration of Sciences. So integrate knowledge from different close or not so much science. The relationship between them contributes to the consistency of knowledge, develops thinking, builds scientific worldview of students. When studying the material unity of the world are finding that there are real synergies between knowledge, the subject of various studies. They become the foundation of various disciplines.

An impression of fragmentation is being created and the process of learning becomes difficult. Through the interdisciplinary connections through which this integration is implemented, it aims qualitatively to be changed the level of development of students in the way of depth penetration in the objectively existing natural laws and phenomena. The complex interdisciplinary approach is an indispensable tool for achieving the overall objectives of the educational process - developing young person in scientific, intellectual, motivational, behavioral, etc. plan.

The interdisciplinary synthesis turns out to be the most appropriate form of realization of integrative tendencies. According to M. Andreev thus the slide - structured training cannot be destroyed.

"The Integrative trends are set to slide and knowledge results from them."[1] And more: "The integrated scientific knowledge does not loose its relative autonomy, but continues to exist, but in a new entirety, with new properties caused by the newly identified overall relations."[2]

The creation of the Labor - Pedagogical Faculty (Geology), later Engineering - Pedagogical Faculty (IPF) to the Higher Pedagogical Institute (dug) and now the Southwestern University (SWU) "N. Rilski "Blagoevgrad, Bulgaria, meet the needs of the country for preparation of wide-specialists. These are teachers, whose preparation is well practiced technical training that will teach technique, technology and entrepreneurship. In this paper are considered some basic pedagogical issues related to technical training of educators. This includes the requirements and considerations determining the level of preparation according to realization of the prepared specialists as future teachers in schools for technical disciplines and practical training. Actual proved to be the right system for building up technical knowledge, starting from the technical education and accumulation of knowledge and skills in students, and ending with the creation of highly qualified specialists in various technical fields. Depending on the tasks that the future teachers will solve, the extent of their technical training is determined. For students who will teach "Lifestyle and Technology", textbooks must be sufficiently thorough, logical and built properly dosed. It is crucial that the content of the curriculum, including disciplines, and the proper preparation of curricula for these subjects, determining the level of knowledge in a scientific field. Preparation educators should be able easily, logically and convincingly convey the necessary information to students. Therefore, the knowledge they need must be moved from the simple to the complex, no heavy mathematical conclusions when looking for a logical connection between the phenomena. It is very important the accessible presentation of the scientific facts and the illustration of their relevance and application that shows most convincingly the need to absorb the knowledge presented. Students should be exempted from learning specific formulas and figures /contained in the relevant directories/ and to be able to make the connection between them, to explore their changes.

The knowledge on mechanics can be constructed at different levels, depending on what category of

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[1] Andreev, M., Integrativni tendentsii v obuchenieto, Narodna prosveta, S., 1986, p.149

[2] Andreev, M., Integrativni tendentsii v obuchenieto, Narodna prosveta,S., 1986, p.71

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professionals they have been designed and what will be their professional activity. The universities and faculties train specialists mainly work as engineers - designers, technologists and technical managers or researchers. The engineers must be able to explore research, design and produce, experiment, implement and produce i. e. to materialize their ideas. The engineering design and operate various components - mechanical, construction, furniture, marine and others. They must possess the necessary degree of practice strength, stiffness and durability. The parts of each structure should be sized so that in terms of its operation they are sufficiently durable, tough and resilient, and cost of material - the lowest. For researchers this knowledge must be more thorough. Conversely, non-machine engineers - electrical engineers, engineer - chemists and others are needed only basic knowledge. They should have an applied character.

The educational specialties with technical expertise are tasked to prepare teachers. Unlike the engineers, they will not design and produce, but will train. The course in mechanics must build in students clearly and permanently engineering vision and a sense of logic of the circuit of the external loads - internal efforts - tensions - deformation - strength, stiffness and durability. The teaching material, the method and language of the faces, have been reduced to somewhere very affordable and descriptive form. Elsewhere, the interpretation of important principled positions requires a thorough insight and concentration.

Knowledge of mechanics is built and different methods. In managing the process of solving, the most important step is to build indicative scheme of action. This scheme at the students - educators was formed as algorithm. It obeys the process of solving strictly defined rules. This is a logical causally prescription business model which with an absolute simplicity requires the execution of operations that follow its commands. The algorithmic modeling regulates the behavior, makes it "a behavior according to conducting rules". It must be said that problem solving algorithm is not a mechanical process that does not require thinking. Using the algorithm requires specification of knowledge, transfer them to a similar or new situation, and it teaches students to think. It has somewhere to automate the process of resolving, but the mechanics is not. The combinations of methods offered securing external loads and distances make different all the tasks that still are solved in the same way.

If we try to express the technological description of the process of learning to solve problems through algorithms formula, it could look like this:

$$A = f(B, C, D)$$

Where **B** is the set of resources that provide the learning process. These are both school information and didactic resources and organizational forms. This includes the human factor (trainees and training providers), reviewed in light of the entry level of the students and a suitably qualified assistant.

With a multitude of didactic procedures that convert academic records. These are the operations performed on the means of education, aiming at managing these operations. (Performance in ready algorithm).

D is a multitude of indices numbering elements of **B and C**, and determining the sequence of their involvement in the learning process.

$$D = 1, 2, \ldots, i, \ldots, n$$

In the **i** - the point represents the realization of a given stage of the learning process to solve problems through algorithms another didactic situation is being seen, part of the overall sequence (the proposed algorithm).

So through the so proposed formula for describing the learning process to solve problems through algorithms, two aspects can be traced:

- Static Process - for each phase detailing all kinds of resources, through which it is realized at a certain level, and operations carried out by / on them;
- Dynamics of the process - the set algorithmic procedures are followed one after another. Their sequence is pre-fixed and does not change from step to step.

The natural course of operations is being observed or the one of the proposed numbering. (If such is available)

The stages of the decision process can be represented as follows: (**Fig. 1**)

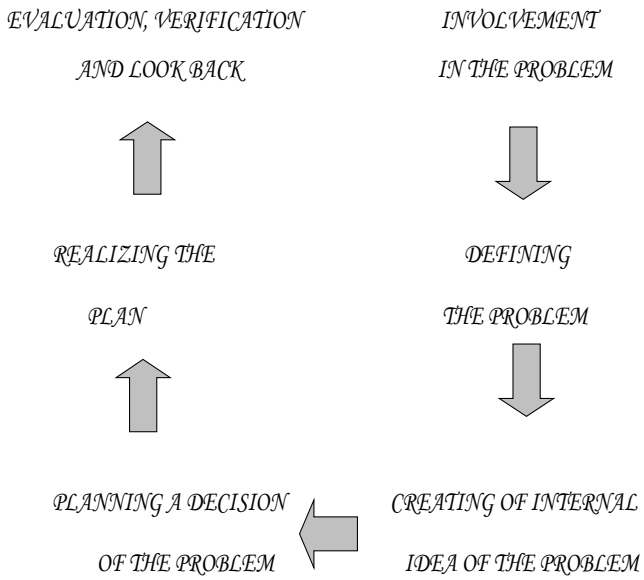

Fig. 1 Stages of the decision process

The eaching methodology for solving problems in mechanics needs to answer the following questions:

a) Who teaches mechanics? (Object of training);
b) What to learn in mechanics? (Strength training);
c) How to study mechanics? (Level of education);
d) How to teach? (Methods of training);
e) When to learn mechanics? (Arrangement in time);
f) Where to be studied? (what kind of school). (**Fig. 2**) (Approach of the six "K")

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Fig. 2 The six "K" approach

- Considering the approach of the six "K", the main tasks of teaching methodology for solving problems in mechanics are:
- To determine the priorities of modern training exercises mechanics in the preparation of teachers of engineering, technology and entrepreneurship;
- To select, sort and systematically updated curricula, based on which problems are solved;
- To establish visual resources, organizational forms, methods and techniques to achieve the best results (need new technological solution).

This paper attempts to contribute to answer the question **"How".** Combining the functions of didactics and algorithm can be said that under didactic algorithm in teaching mechanics we can understand a set of rules for performing elementary operations in a sequence designed to train students in solving problems of a given type and form skills for learning - cognitive activity.

Mechanics is a difficult and complex to study general engineering discipline. Therefore, the theory must be considered thoroughly and creatively, and the tasks to be solved after the most detailed study and understanding.

The simultaneous study of the pedagogical and technical disciplines is a demanding and responsible task. However, the result is good. There have been grown up specialists with extensive training in a wide range of knowledge.

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