

**THE ESSENCE OF THE PRINCIPLES OF EDUCATION IN ENGINEERING PEDAGOGY**

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Abstract

This article focuses on the educational principles of the didactics of engineering pedagogy, considers the principles of education as the main rules that determine the interaction between the teacher and the student in the pedagogical process, describes in detail the rules necessary for the effective organization of the educational process, and explains the basics of the principles of education and their importance in practice, explains the relationship between the educational and production processes. Opinions were expressed on how dependency, in accordance with modern requirements, should be carried out in engineering pedagogy, systematic, grounded, continuity, scientificity, comprehensibility and several other principles of the pedagogical process were discussed.

Keywords: engineering pedagogy, principles of education, didactics, teacher-student collaboration, pedagogical process, systematization, continuity, scientificity, intelligibility, practice and theoretical communication.

Introduction

One of the main issues of the didactics of engineering pedagogy is the principles of education. We use this phrase in our work as an international principle, recognizing the rules, principles and principles of education as synonyms. Principles of education are a system of basic rules that determine the interaction of participants in the pedagogical process. Ignorance of this system of rules, or inconsistency in the application of them, hinders the work of the whole holistic engineering pedagogy – education.

He was the first to develop a system of educational principles, Y.A. Komensky developed it on a scientific basis. He called these principles the rules that would form the basis for the organization of the educational process.

Knowledge of the rules, i.e., the essence of the principles, to which the pedagogical process must be followed is to have a clear knowledge of this process. Therefore, we will briefly dwell on some of them below.



1. The principle of systematism (integrity, unity) of the pedagogical process – the combination of education and upbringing and personal development (maturation) – means that it has a certain system.

2. The principle of groundedness – the essence, essential features, connections, certain relationships with the objective world of the object of study (precedent, event, process, even man as a living being). By interpreting each educational precedent as the foundations of theoretical science, he acquires systematizing information that is considered "core", "core" for himself, and the assimilation of this information by the individual serves as a basis for his/her acquisition of knowledge, skills, qualifications and personal qualities in a specific field. Such an approach to the educational material allows to perfectly master the basic educational material in conditions of a rapid flow of information to optimize the pedagogical process (Yu.K.Babansky, M.M.Potashnik), accelerate (R.Kh.Jo'rayev, F.Yuzlikaev, V.F.Shatalov, N.G.Dayri, M.I.Makhmutov)

3. The principle of humanization is used in conjunction with humanization in pedagogical practice. Although both of these concepts are lexically derived from the Greek word "humanus" for humanity and "humanitas" for humanity, their meaning of different meanings has been recognized by scholars.

Humanization - implies the need to incorporate into the content of educational precedents the ideas of respect for the human factor, its dignity, honor, honor, rights and duties.

The principle of humanization is the idea that all virtues, conditions, human perfection in the objective universe serve for the well-being and peace of human society. This idea, the requirements of the present time and perspective justify the need not to approach the pedagogical process in an authoritarian way, but to organize and implement it on the basis of the participation of its participants.

4. The principle of continuity - the development of science, the application of advanced production technologies to practice on a large scale, implies that in order to independently work creatively in the present time and future, it is not possible to impart to a person the knowledge, methods of action and personal qualities sufficient for his whole life, but will be improved throughout his life. This principle requires the teacher to create the necessary conditions to ensure the independence of students in educational work.

5. The principle of theory in relation to practice (life) – refers to the fact that the knowledge acquired by students is significant only if it is applied or programmed in their indirect life activities. Knowledge that is not applied in practice is groundless and is forgotten for a short time.

6. The scientific principle of education. The process of knowing the universe that surrounds us is complex, contradictory, and involves all sorts of stages, forms, and means. Scientific cognition consists in the transition from an event to the essence, from the external impact of a thing to the description of its internal structure. If the textbook introduces the student to the world of laws, concepts, formulas, and theories, such knowledge is called scientific knowledge. They are essential for mental development. Only such knowledge will allow one to master the scientific content of the educational precedent, and in the future, to take a deeper grasp of the foundations of science and take an active part in the community.

7. The principle of intelligibility. The ease of mastering knowledge, the formation of qualifications and skills indicate their relationship with the level of development of students



and their personal experience. Knowledge is not intelligible if such connections cannot be identified.

Everything in the universe is interconnected, all things are connected between events. That is why all sciences, all educational precedents are interconnected. The knowledge that the student absorbs is a particle of the experience of human society and therefore new knowledge can be combined with existing knowledge.

8. The principle of exhibitionism of education. In the early stages of the development of human society, education was carried out at the expense of children imitating adults, repeating practical actions performed by adults. This simple form of teaching has survived to this day due to its persuasive and effective nature. In the 17th century, Ya.A. Kommensky described the principle of exhibitionism as the basis for the success of teaching in any way. I.G.Pestalotsti made this principle the main tool of teaching.

The current interpretation of the principle of exhibitionism includes the following basic provisions:

- Justifies the need to organize a student's emotional cognition by means of exhibitionism;
- The use of visual aids is one aspect of organizing emotional cognition in the learning process.

9. The principle of awareness and activity of education. This principle, as a rule based on the cognitive activity of students, includes three important aspects: a conscious understanding of the educational material by students, a conscious attitude to educational activities, and the formation of cognitive activity.

10. The principle of thoroughness of education. The thoroughness of mastering the educational material depends on many factors: the scientific and systematic nature of the explanation, the consciousness of understanding, the cognitive activity of students, the reasons for reading, the skill of the teacher, and so on.

The principle of thoroughness of teaching is the main rule in the analysis of aspects of the educational process that allow the achievement of knowledge thoroughness.

11. The principle of individualization of education – each student has not only general qualities but also individual qualities. A student's cognition, will, emotion, and personality traits can have a positive or negative impact on the course of education. Taking into account the individual characteristics of students, the organization of the training (lesson) process, individualization of teaching is carried out.

12. The principle of professional mobility provides for the ability of a person to master new technologies and effective technologies that are being implemented in the shortest possible time. The adaptability, creative description of the work directly depends on the human world, the breadth of the scope of knowledge, the ability to find solutions to problems encountered in professional activities, in the words of psychologist scientist L.S. Vgotsky, "education that goes ahead of practice and paves the way for it is good". That is why it is necessary to pay attention not to what today's student knows, but to what he can do and what he or she can be capable of tomorrow.

13. The principle of modularity of engineering pedagogy – the essence of modular education is that the student independently achieves a didactic goal based on a personal curriculum consisting of a bank of information and methodical instructions. The purpose, content and organizational methodology of modular education allows us to determine:



- ✓ distinguish between the content of education and the specific dynamically variable and invariable knowledge;
- ✓ The program has a variable character;
- ✓ The content changes according to the social order.

The use of modular education makes it possible to structure learning materials, i.e., its constituent parts, in the required manner. This, in turn, makes it possible to modify the content, to add to it, while maintaining its integrity.

The implementation of the principle of modularity ensures:

- To infiltrate all activities to achieve subjective goals and to systematically seek alternative solutions to achieve subjective goals;
- in the future, to orient the subject to improving the level of professional training;
- The modules provide an opportunity to take into account changes in all spheres of life, including science and technology.

14. The principle of creating a comfortable environment - first of all, safety of life and safety, material-technical and educational-methodological, technical, technical, ergonomic, economic, pedagogic, sanitary and hygienic, environmental and similar requirements. The formation of such an environment requires the development and implementation of certain social, psychological, and pedagogical systems. The creation of regulatory conditions determines the system of optimization of pedagogic effects.

15. The political principle is the acquaintance with the general foundations of modern technical and industrial technologies, the formation of systematic knowledge. The implementation of the politicographical principle requires the following conditions:

- compliance of the educational content with the main directions of science and technology;
- organization of educational materials in the form of interrelated holistic knowledge;
- linking the studied material with future professional activities;
- compliance of the educational material with the age and individual characteristics of students;
- Opportunities to meet students' cognitive interests;
- reliance on basic general scientific knowledge and skills;
- stability and dynamic variability of educational materials;
- Consistency;
- compliance of the educational content with the material and technical base;
- taking into account the factors affecting the production facility;

16. The principle of combining education with production. The principle of the relationship between theoretical education and practice. The interconnectedness of theory and practice is a two-fold process. They're organically related to each other. The implementation of this principle depends on the observance of the following conditions:

Theoretical knowledge should be advanced in relation to practice, and its correctness should be checked in practical training. In any process, it is necessary to synthesize knowledge and qualifications in different fields.

To improve the effectiveness of training qualified specialists, knowledge of the field should be tested. In this regard, the integration of the content of education should be carried out in the following two directions: firstly, the integration of professional knowledge and



qualifications within a single framework, and secondly, the implementation in the horizontal direction of the interrelation of special knowledge and qualifications.

17. The principle of economic expediency - the expediency of training specialists in educational institutions, the balance in their needs of the state and society.

18. The principle of interdependence in education - general, special and general educational precedents in educational institutions should be studied in conjunction with other educational precedents. At the same time, the topics in the curriculum are not repetitive, but complement each other.

19. The principle of reduction - provides for the possible compactization of the educational text, that is, the isolation of the most important system-forming part in the conditions of a rapid flow of information, which is directly related to the development of science and technology, the introduction of advanced production technologies into practice. It is imperative that this compactness does not have a negative impact on the adequate and necessary level of content communicated through the State Education Standard.

20. The principle of reflexivity is the subject's assessment of his or her own personal activity, his/her mastered life experience, the opinions of others about him/her, and describes the dialogue and relationships with which he cooperates.

21. The principle of acceptability describes the achievement of effective results at the expense of the convenience of pedagogical conditions, taking into account the available opportunity, spending little time, money and exertion.

22. The principle of natural development and socialization in the educational process - knowledge of the essence of natural processes - provides for the organization of the educational process effectively, taking into account the age characteristics of students, the stages of emotional development, the possibility of transition to the next stages of development. In a word, the socialization of education indicates the assimilation of social experience by students on the basis of individual laws.

23. The principle of socio-economic support - providing for the socio-economic expediency of the pedagogical process, provides for the integration of the activities of all types of educational institutions, taking into account the capabilities of the participants of this process, the requirements of the state and society, the development of science, the needs of production, their harmonization, integration.

The principles of education have been explored by many pedagogical people, but it is an incomplete, system. In conclusion, private principles are applied in engineering pedagogy that take into account the specific characteristics of education. These principles are directly related to the general didactic principles and represent the requirements for the educational process and the laws to which it must be followed.

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