

THE INTEGRATION OF PEDAGOGICAL TECHNOLOGIES AS A CONDITION FOR IMPROVING THE QUALITY OF EDUCATION

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ABSTRACT

The article presents the results of a study of the activities of educational institutions to solve an actual problem - the problem of improving the quality of education. One of the promising ways to improve the quality of education in educational institutions is the integration of pedagogical technologies. The aim of the study is the development and theoretical substantiation of the system of integration of pedagogical technologies, the advantage of which is the sum of the advantages of the constituent technologies and focused on improving the quality of education. The model of flexible integrated technology of project-module training is proposed as an example. The developed models of flexible integral pedagogical technologies were experimentally tested and widely tested in the activities of Kazan Federal University, Kazan State Power Engineering University, Samara National Research University and several schools in Kazan (Republic of Tatarstan). This approbation led to the conclusion about the effectiveness of these models. The results of the study indicate the positive impact of these models on the main parameters characterizing the effectiveness and quality of the pedagogical process in the education system. The study confirmed that one of the important ways to increase the efficiency of the pedagogical process in education is the integration of pedagogical technologies, the implementation of flexible integrated pedagogical technologies capable adapt to different levels of complexity of pedagogical conditions and effectively solve modern problems of education. The integration of pedagogical technologies, the implementation of flexible pedagogical technologies in education allows not only to improve the quality, but also the efficiency of education, ensures the operational regulation of pedagogical technologies and the conditions of the educational process, considering the type and theme of the academic discipline, the level of students' development, availability of material resources, tasks of education.

KEYWORDS

Pedagogical technology, Integration, Improving the quality of education, Flexible technology of project-modular training.

1. INTRODUCTION

The current stage of human civilization development imposes rather high requirements for their professional competence. The effectiveness of the pedagogical process in some educational organizations remains low. Some teachers use traditional methods that are not adapted to the existing conditions of the educational process. Some scientific and pedagogical workers own innovative pedagogical technologies that solve only several educational tasks. Some teachers do not have innovative technologies that comprehensively and effectively solve modern pedagogical tasks as indicated by many researchers (Polat, 2007; Yefimova, 2017; Kozma, 2003; Ahmed, 2012; Kuzmina *et al.*, 2018; Kuzmina *et al.*, 2018; Solnyshkina *et al.*, 2014; Kheirabadi & Mirzaei, 2019; Kashisaz & Mobarak, 2018; Nakhaee & Nasrabadi, 2019; Jasur & Nilufar, 2018).

Due to the low efficiency of the pedagogical technologies implemented by teachers, the quality of education remains low. This is evidenced by the level of the final and intermediate results of the work of some educational organizations.

One of the important ways to improve the efficiency of the pedagogical process in the education system is the integration of pedagogical technologies, implementation of flexible integrated pedagogical technologies which can adapt to different levels of pedagogical conditions and effectively solve modern educational problems (Grudtsina *et al.*, 2017; Kasteyeva, 2018; Eslami & Ahmadi, 2019; Jabbari *et al.*, 2019).

Thus, the scientific novelty of the research is determined by the fact that it was the first at the didactic level to develop a model for the integration of pedagogical technologies, to identify goals, objectives, principles, and conceptual foundations of innovative integrated technology. Also for the first time, a model and concept of an integrated technology of project-module training in a general education and universities were developed.

2. MATERIALS AND METHODS

The experience in implementing integrated learning technologies is described in the works of Vyacheslav Guzeev (1999), “*System bases of integrated educational technology*” and Mouratt Choshanov (1996), “*Theory and technology of problem-module training in a vocational school*”.

Currently, the concept of “technology” is interpreted in different ways. We understand “pedagogical technology” as a holistic pedagogical system focused on the effective achievement of educational and educational tasks and presented in the form of goals, objectives, conceptual foundations, principles, features of building the content, methods and algorithm of organizing the pedagogical process.

The most common educational technologies currently are:

- Project training.
- Technology of student-centered learning.
- Modular training.
- Information technology.

Each of these pedagogical technologies provides an increase in the efficiency of the pedagogical process based on the realization of any achievement of pedagogy. The flexible integrated technology, in turn, includes all the best technologies comprising it, provides a practical orientation of training, activates independent work, motivation of students, implementing differentiation and individualization of learning, provides an opportunity to form students’ individual learning paths and development. In general, under the integration of educational technologies, we understand the process and the result of the union of educational technology in some integrity, followed by sealing connections between its components. The result of this association is an innovative technology (integral).

The connection between pedagogical technologies is determined by the general main goals of education, as well as by a wide range of tasks solved (Galiakhmetova, 2016; Gabitov *et al.*, 2017; Solnyshkina *et al.*, 2016).

After analyzing technologies of project, modular training and information technology, we found it possible to integrate them into a new technology - a flexible technology of project-module training and to determine the goals, objectives, principles and conceptual foundations of this technology.

Currently, the implementation of almost all pedagogical technologies requires computer tools, modern information technologies (Kabirova *et al.*, 2018). In this regard, the term “computer learning” in the name of innovative integrated technology is not necessary to endure. Therefore, we will designate an innovative integrated technology as a flexible integrated technology of project-modular training.

The objectives of the flexible integrated technology of project-module training:

- 1) The development of the individual cognitive abilities of the student.
- 2) Effective training based on a scientifically developed program.
- 3) The formation of skills to work with information, the development of communication skills (Solnyshkina *et al.*, 2014; Yakupov *et al.*, 2018).
- 4) To form the student's maximum educational information (as much as he can learn).
- 5) The formation of research skills, the ability to make optimal decisions.

The main conceptual provisions of the technology of project-modular and computer training:

Individual, personality-oriented independent educational and cognitive activity of students with the assistance of a teacher.

Awareness of the learning problem by the students and an orientation towards the achievement of significant educational goals and the final practical result.

The essence of project-modular and computer-based education is that a student, independently or relatively independently, can work on an educational project based on an individual program of actions offered to him, bank of information, and methodological guidance for achieving the set of educational goals and the final practical product. In this case, teacher's functions can vary from information-controlling to advisory-coordinating.

The key goal of the project-modular and computer-based learning technology is to improve the quality and effectiveness of the learning process based on:

- a) Development of creative thinking, abilities to work with information, development of universal educational actions.
- b) The formation of research skills.
- c) The development of individual cognitive abilities.
- d) Implementation of computer tools.

Principles of project-modular and computer-based training:

- 1) Modularity (considered as a principle of the system approach, development, dynamism and lability of the system functioning). Relying on the principle of modularity in the learning process contributes to the development of knowledge mobility and technology flexibility.

The implementation of this principle allows:

Integrate and differentiate the content of training based on the systematization and differentiation of project modules of educational material, ensuring the development of the course (subject) in full, abbreviated and in-depth versions.

Make an independent choice of a student of the course the appropriate option depending on the level of training, development, and provide individual pace of the work program.

Reduce the training course without prejudice to depth of learning material.

Strengthen the advisory and coordinating functions of the teacher on the students' independent cognitive activity.

2) Problem making principle - the principle provides for the creation of special situations of intellectual difficulties, problem situations and their solutions in the process of learning. Creation and analysis of the problem is the initial stage of the algorithm of the considered technology. This stage ensures the activation of students' mental activity, the use of non-standard approaches to solving problems, the development of students' creative and critical thinking.

The formation of criticality in the process of project-module training is carried out based on purposeful creation of special situations - situations for finding errors.

3) «Compression» of educational information. This principle is based on the main directions of the theory of educational information compression:

- a) The theory of didactic units' integration (Erdniyev, 1986).
- b) The theory of meaningful generalization.
- c) The concept of knowledge engineering.

Orientation to the final practical product - the principle means that the goals in the project-module training should not only be certain knowledge, skills, competencies that must be formed among the students. The main purpose of training based on this innovative technology should be:

- a) The creation (preparation) of the final practical "tangible" product (for example, in the form of a school museum, conference, video, book, sports or literary festival).

- b) Development of a project (model, construct) of the final product (for example, development of a museum project, conference program, sports or literary festival, etc.).

In this context, the final educational goals in relation to the goal (as the final practical product) are only a means of their realization. The logic of the educational process here is: “in order to develop, create a final product (conference, video, literary celebration, etc.) it is necessary for students to master certain knowledge, abilities, skills”. This principle involves the stimulation of students learning activities and motivation rise.

- 4) Computerization of training - the principle of using computer tools in training.

Thus, it can be concluded that the project-modular and computer-based training technology is built on the integration of the “efforts” of five factors: problem making, modular, “information compression”, orientation to the final product, computerization of training.

The efficiency of project-modular training technology is also improved through the implementation of additional principles that derive from the previous four principles.

Additional principles of project-modular training technology:

1. Adaptability (flexibility) or control of the educational process (at any time a teacher can correct the educational process). This principle is an addition to the modularity principle.
2. Motivation (stimulation) of educational and cognitive activity (the principle follows from the principle of orientation to the final practical product).

Flexibility of integrated technology can be defined as the ability to respond quickly and adapt to changing pedagogical conditions.

3. RESULTS AND DISCUSSION

The developed models of flexible integral pedagogical technologies were experimentally tested and widely tested in the activities of Kazan Federal University, Kazan State Power Engineering University, Samara National Research University and several schools in Kazan (Republic of Tatarstan). This approbation led to the conclusion about the effectiveness of these models. The results of the study indicate the positive impact of these models on the main parameters characterizing the effectiveness and quality of the pedagogical process in the education system.

So, there is a positive trend in the experimental groups of universities:

- A) The results in training (the number of students who passed the exam on good and excellent marks increased from 51.2% to 71.6%).
- B) The quality of the educational process (the number of studies in which the students' independent activity was activated increased from 41% to 81%).
- C) The level of teachers' creative self-realization (the number of teachers with a high level of creative self-realization increased from 34% to 62%).

4. SUMMARY

The study confirmed that one of the important ways to increase the efficiency of the pedagogical process in education is the integration of pedagogical technologies, the implementation of flexible integrated pedagogical technologies capable adapt to different levels of complexity of pedagogical conditions and effectively solve modern problems of education.

The integration of pedagogical technologies, the implementation of flexible pedagogical technologies in schools and universities allows not only to improve the quality, but also the efficiency of education, ensures the operational regulation of

pedagogical technologies and the conditions of the educational process in schools and universities, considering the type and theme of the academic discipline, the level of students' material resources, tasks of education.

Thus, we were able to justify the conceptual conditions of the study, consisting of the fact that:

- Integration of pedagogical technologies is an important condition for improving the efficiency and quality of the pedagogical process.
- Design and implementation of managed (flexible) integrated educational technologies to create a mechanism of stable and continuous development of self-managed educational institution.

5. CONCLUSION

The study made it possible to summarize that the actualization of the practice of improving the quality of education based on the integration of pedagogical technologies is caused by the objective trend of the modernization of education. This fact necessitated the mastering of pedagogical workers by the newest pedagogical methods and ideas of modern pedagogy, in mastering the mechanisms of replacing the existing separate scattered pedagogical technologies with complete systems of effective flexible pedagogical technologies. These systems combine the achievements of existing technologies and provide solutions to the key tasks of modern education.

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