

THEORETICAL ASPECTS OF ORGANIZING STUDENTS' INDEPENDENT WORK IN THE INFORMATION TECHNOLOGIES COURSE

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Abstract: This article analyzes the theoretical and methodological foundations of organizing students' independent work in teaching the subject "Information Technologies" within the higher education system. The author elaborates on the role of independent learning in activating students' academic and cognitive activity, as well as issues related to designing this process using modern IT tools. The article provides a theoretical justification for the essence of the concept of independent work, its structural components, and its significance in developing students' professional competencies. Furthermore, effective models for managing students' independent activities in the context of distance learning platforms and digital technologies are proposed.

Keywords: Independent learning, information technologies, competency, theoretical aspect, academic activity, digital education, methodology, credit-module system.

Organizing students' independent work in the Information Technologies course may be interpreted as a type of educational activity built upon the implementation of an increasingly complex system of tasks. Taking into account the psychological characteristics of human thinking, proper preparation of students in technical specializations must be grounded in the development of technical skills for applying descriptive and visual reasoning, as well as software usage.

At present, it is of great importance to teach students to apply information technologies practically — both in their professional activities and in everyday life. Information technologies must be closely integrated with general cultural values and philosophical concepts, as well as with facts and events in history, languages, literature, art, and music. Special attention should be paid to the correct understanding and use of terminology.

A distinctive feature of the goal of teaching information technologies as a discipline in an information society is the necessity of teaching students not only to use a specific set of software, but also to independently master new programs on their own. To achieve the objectives of teaching the Information Technologies course, it is necessary to develop in students an "intuitive sense" for applying it in professional work and in everyday life. Independent work and self-directed learning should be oriented toward engaging students in research activities.

The characteristics of organizing independent work in the Information Technologies course for students enrolled in technical specializations include the following:



- The need to consider the psychological characteristics of technical-specialty students' thinking and their level of preparedness in information technologies;
- Organizing the distinctive features of education (focusing on the intellectual and spiritual development of the individual, cultivating a culture of perceiving new information);
- Teaching Information Technologies to technical-specialty students must be connected to their general cultural values;
- Comprehension of the academic material being studied arises on the basis of descriptive and visual reasoning;
- Satisfying students' need for systematic work (as a foundation for the practical assimilation of academic material);
- Organizing students' individual (personalized) work activities;
- Organizing the independent study of a number of topics within the academic material;
- It is necessary to consult with the instructor in order to carry out independent work outside the classroom.

In addition to the above, it is expedient to employ the following activity methods in organizing students' independent work: role-playing games, heuristic conversations, problem-solving, technological case analysis, the project method, and other similar approaches.

One of the active teaching methods is the use of case technology. Prior to using this method in instruction, a specific example is developed or ready-made materials describing a real professional situation are utilized. At the same time, the description of the situation not only reflects a practical problem but also activates a certain body of knowledge. It should be kept in mind that the presented problematic situation may not have definitive solutions. Since attention is focused on practical problems, case studies allow students to clearly see why, and in what circumstances, a particular piece of academic material may be useful, and how it can be applied in practical daily activities — thereby enhancing learning motivation.

Case technology has been characterized as a teaching method designed to develop skills and experience in the following areas: "identifying, selecting, and resolving problems; working with information; understanding the significance of details described in a situation; analyzing and synthesizing information and evidence; working with assumptions and conclusions; evaluating alternative options; making decisions; listening to and discussing classmates' opinions; and developing skills for working in groups in practical daily life" [65].

The case method was first used in 1869 at Harvard Law School. In 1908, Harvard Business School was established, and a mandatory case-analysis course titled "The Art of Conducting Business" was incorporated into its Master of Business Administration (MBA) program. Private business owners were invited to the course and discussed problems encountered in their own practice. After two days, each student submitted a written report containing an analytical examination of the problem along with a recommended solution, which was then discussed collectively with the group of entrepreneurs.

The new Dean, banker Wallace Donham, proposed that instructors reconsider the lecture-based approach (in 1919) by "building collections of cases." In 1921, the first collections of cases were published in Harvard University's business reports, and by 1922, 85 educational institutions had begun applying them in their work. Wallace Donham also organized a series



of sessions on case-based instruction, and since that period, Harvard has been regarded as the leading proponent of the case method [222].

Today, the application of situational tasks is carried out not only in business education, but across all fields of human knowledge. Educators from various disciplines have used case technologies not as a specialized course on situational analysis, but as an instructional technology within regular classes. "Various organizations in many countries around the world (institutes, universities, etc.) maintain their own case collections. The rights to the majority of these cases belong to the European Case Clearing House (ECCH), established in 1973 on the initiative of 22 higher educational institutions, and it is the leading organization for collecting and distributing cases" [53].

In the Commonwealth of Independent States (CIS) countries, this approach began to be applied primarily in economics-oriented specializations at universities, and foremost as a method for teaching decision-making. The history of case technologies is associated, to a considerable degree, with the support of international educational foundations and programs.

At present, this method has become widespread particularly in the teaching of economics and management disciplines, and likewise in business education. The teaching of the subject has been implemented through the introduction of the revised State Educational Standards of higher education.

The case method is based on the following didactic principles:

1. An individual approach to each student, taking into account his or her characteristics, needs, and learning style.
2. Ensuring maximum freedom in the learning process.
3. Providing a sufficient amount of illustrative materials.
4. Focusing on core principles, taking into account the "overloading" of listeners with large volumes of theoretical material.
5. Ensuring mutual comprehensibility in communication between the instructor and the student.
6. Developing students' skills in self-organization and working with information.
7. Nurturing the student's strengths and positive qualities.

The core functions of a case consist of the following: teaching, instruction, analysis, research, systematization, and forecasting. One of the widely used approaches in classifying cases is their level of complexity [65]. Furthermore, cases are divided into the following categories:

- Illustrative learning situations (teaching students the algorithm for making the correct decision in a given situation through a practical example);
- Educational situations involving problem formulation (a situation over a defined time period; the goal is to teach situational diagnosis and independent decision-making);
- Educational situations without problem formulation (the situation is more complex; the problem is not clearly defined but is only indicated in statistical data, public opinion, assessments of authorities, etc.; the goal is to independently identify the problem and to present alternative ways of resolving it through analysis of financial resources);
- Practical exercises (a developed, specific situation; the goal is to find ways to resolve the problem).



Regarding the principles of constructing a case, the following main stages are recommended:

- Formulating the didactic objectives of the case.
- Defining the problematic situation.
- Drafting a programmatic situation map consisting of the key theses that the text must reflect.
- Constructing or selecting a model of the problematic situation.
- Choosing the genre of the case.
- Writing the case text.
- Diagnosing the correctness and effectiveness of the case.
- Preparing the final version of the case.
- Preparing methodological guidelines for using the case.

The completeness of requirements for a case consists of the presence of the following components: situation, conflict, problem, action, indicators, solutions, and information necessary for completing the task. Organizing the learning process using case technology includes the following stages:

- Preparation (determining the place of the case in the academic course; searching for sources; creating a work model; describing the course of the lesson).
- Introduction (engaging students in the analysis of a real situation; selecting the most appropriate form for presenting the material for familiarization).
- Analytical (group discussion of the situation or individual study of the problem by students; preparing a solution).
- Final (the main task at this stage is to present and justify the solution based on the situation).

The consideration of mini-cases remains relevant today. They are two to three pages in length, concise in content, and include a description of events or problems, as well as data presented in tables or questions. The evaluation criteria for conducting practical research are: understanding the problem, formulating the problem, selecting criteria for problem resolution, generating alternative options, evaluating options and selecting the most correct solution to the problem, developing an implementation strategy, and presenting conclusions.

The effectiveness of using case technology is linked to students possessing a solid foundation of theoretical knowledge, being able to apply methods of analyzing and researching socioeconomic processes and phenomena, having experience in participating in debates, and working in small groups. It is also connected to the instructor's professional readiness for forming interdisciplinary integrated knowledge, using active teaching methods and techniques to stimulate creative thinking, and maintaining constant engagement of learners (strict adherence to discussion rules is of great importance).

The next active teaching method deserving attention is the **project method**. It requires the practical application of theoretical knowledge in solving specific tasks or problems through students' collaborative activity, and is widely used in many countries. The project method was developed by the American philosopher and educator J. Dewey and his student W. H. Kilpatrick. J. Dewey proposes organizing the learning process on an active basis — through the student's goal-directed activity and in accordance with the student's personal interest in the specific knowledge in question. At the same time, this method developed actively and with



great success in foreign schools. In the United States, Great Britain, Belgium, Israel, Finland, Germany, Italy, Brazil, the Netherlands, and many other countries, J. Dewey's ideas of a humanistic approach to education found wide dissemination through his project methodology, earning great renown for the rational integration of theoretical knowledge and its practical application in solving specific real-world problems through students' collaborative activity.

CONCLUSION

– Improving the effectiveness of teaching the Information Technologies course within the higher education system is directly dependent on the systematic organization of students' independent work. Based on the theoretical analyses conducted, the following conclusions can be drawn:

– Systematic approach: In organizing independent work in the Information Technologies course, it is necessary to account for students' psychological characteristics and their level of technical skill development.

– The role of case technology: The case (situational analysis) method not only consolidates theoretical knowledge in students but also develops the skills to identify, analyze, and propose alternative solutions to practical problems.

– Effectiveness of the project method: The use of the project method directs theoretical knowledge toward solving real-life and professional tasks, which in turn enhances students' learning motivation.

– Professional preparation: Independent work must teach the student not merely to use ready-made software, but to independently master new technologies and apply them at an "intuitive" level in professional practice.

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