

IMPROVING THE METHODOLOGICAL MODEL FOR PREPARING STUDENTS FOR RESEARCH ACTIVITIES IN THE CONTEXT OF DIGITAL EDUCATION

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Abstract: This article analyzes the methodological model and its structural components for preparing secondary school students for small-scale research activities in the context of digital education. The study substantiates the purposeful, substantive, procedural, and result-evaluative components of the process of forming students' research competence as an interconnected pedagogical system. The development of the model is based on the principles of systematicity, integrated learning, activity-orientation, creative-scientific approach, unity of theory and practice, and pedagogical modeling. The result-evaluative component substantiates the mechanism for determining students' research readiness based on high, medium, and low levels, as well as adjusting educational strategies based on monitoring results.

Keywords: digital education, research activity, research competence, methodological model, literary education, interactive methods, creative and scientific laboratory, digital educational environment, pedagogical model, assessment criteria.

INTRODUCTION

In the modern educational process, a student is required not only to master

ready-made knowledge but also to possess research skills such as independent searching, sorting, analyzing information, identifying problems, putting forward scientific hypotheses, drawing conclusions based on evidence, and presenting their results. From this perspective, preparing students for minor research activities at the general secondary education level is one of the important tasks of the continuous education system.

The development of the digital educational environment creates new pedagogical opportunities for this process. Electronic resources, virtual platforms, multimedia tools, forms of distance learning, and interactive communication tools allow for the enhancement of a student's independent work with information, the individualization of the educational process, and the practical organization of research activities [1].

The main tasks of the methodology model for preparing students for research activities in the context of digital education are:

- systematic formation of students' scientific thinking;
- sustainable development of students' skills in preparing for research activities;
- ensuring thorough and effective preparation of students for future small-scale research-oriented professional activities.

As a target component of preparing students for small-scale research activities, the formation and development of their research abilities are envisaged, including the effective implementation of teaching, upbringing, and creative professional functions.

In the analyzed source, the methodology for preparing students for research activities in the context of digital education is interpreted as a holistic didactic system linking the goal, educational process, and final result. The main objectives of the model are the systematic formation of students' scientific thinking, the development of skills for preparation for research activities, and their preparation for future small-scale research-oriented activities [2,3].

The relevance of the research lies in the fact that digital educational tools

themselves do not automatically form a student's research competence. To achieve this, it is necessary to integrate digital tools with a specific pedagogical goal, content, method, form of activity, and evaluation criteria.

Based on this, the aim of the research is to identify the components of a methodological model aimed at preparing students for small-scale research activities in digital education, substantiate their interdependence, and improve the methodology for its use in the process of literature education.

The tasks of the research are to structurally describe the methodological model of preparing students for research activities, to determine the target, content, process and result-evaluative components of the model, to systematize effective pedagogical methods and tools used in the context of digital education, to determine the forms of organizing small research activities in literature lessons, and to characterize the criteria and levels of assessment of students' research competence [4,5].

METHODOLOGY

The methodological basis of the study consists of pedagogical modeling, systemic, integrative, and activity-oriented approaches. In the analyzed material, the model is explained by the interconnectedness of all components and their improvement based on a unified scientific, pedagogical, and methodological approach.

In the course of the study, methods of theoretical analysis, pedagogical modeling, analysis of educational and methodological materials, generalization of pedagogical experience, comparative analysis, observation, diagnostic assessment, monitoring, and analysis of activity results were used.

In the development of the methodological model, the integration of the general secondary education literature curriculum with research activities is taken as the main direction. In the model, the principle of systematicity ensures the interconnection of all components, while the principle of integrated learning ensures the harmony of educational content, forms, tools, and methods.

In the research methodology, special attention is paid to combining

individual, group, and collective forms of student activity. This involves the use of activities such as individual small projects, group practical sessions, team conferences, presentations, and the preparation of abstracts and articles [6,7,8].

RESULTS

As a result of the analysis, it was determined that the methodological model for preparing students for research activities in the context of digital education consists of four interconnected components:

1. Target component.

The target component is aimed at forming and developing students' research abilities. It defines the student's independent thinking, interest in scientific research, creative approach, and readiness to carry out research activities as the primary pedagogical outcome.

2. Content component.

The substantive component covers two main areas. The first is a set of knowledge, skills, and abilities that meet the requirements of the state educational standard for general secondary education. The second is the orientation of educational content toward the future professional and personal development of the student in a changing social environment.

In the content of literary education, activities such as analyzing a work of art, determining the author's position, working with evidence, comparing various sources, processing the text, and drawing independent conclusions can serve as a methodological basis for developing research competence.

3. Process component.

The process component includes management and organizational parts. Its main task is the purposeful combination of modern forms, methods, and didactic means of teaching.

In this component, the combination of methods is of particular importance. In particular, the processing of visual and auditory information through thinking can enhance students' scientific and creative perception and activate independent thinking and intellectual activity.

Adabiyot darslarida ta'lim jarayonini optimal olib borish, o'qitish metodlari hamda vositalarini to'g'ri tanlash, ularni maqsadli birlashtirish orqali har tomonlama qo'llashni ta'minlaydi. O'quvchilarni kichik ilmiy-ijodiy tadqiqot jarayonlariga tayyorlash, xususan, ta'lim dasturlarini amalga oshirishda hamda kreativev laboratoriyalar faoliyati asosida ularni tadqiqotchilik kompetensiyalarini rivojlantirishda bir qator samarali pedagogik, didaktik metodlardan foydalanishni taqazo qiladi.

School practice in literature classes:

- 🎨 visual and illustrative methods (demonstration, etc.);
- 🗣 oral presentation (explanation, conversation, discussion, lecture, etc.);
- 📐 practical (individual project, calculation and graphic work, etc.).

Combinational technologies developed as an integrative model for preparing students for small scientific and creative research constitute a complex system of methods, forms, and tools aimed at implementing research activities by increasing the mobility of correctional-pedagogical, practical, and methodological design of educational and graphic tasks that enhance academic and social motivation, as well as the mobility of feedback.

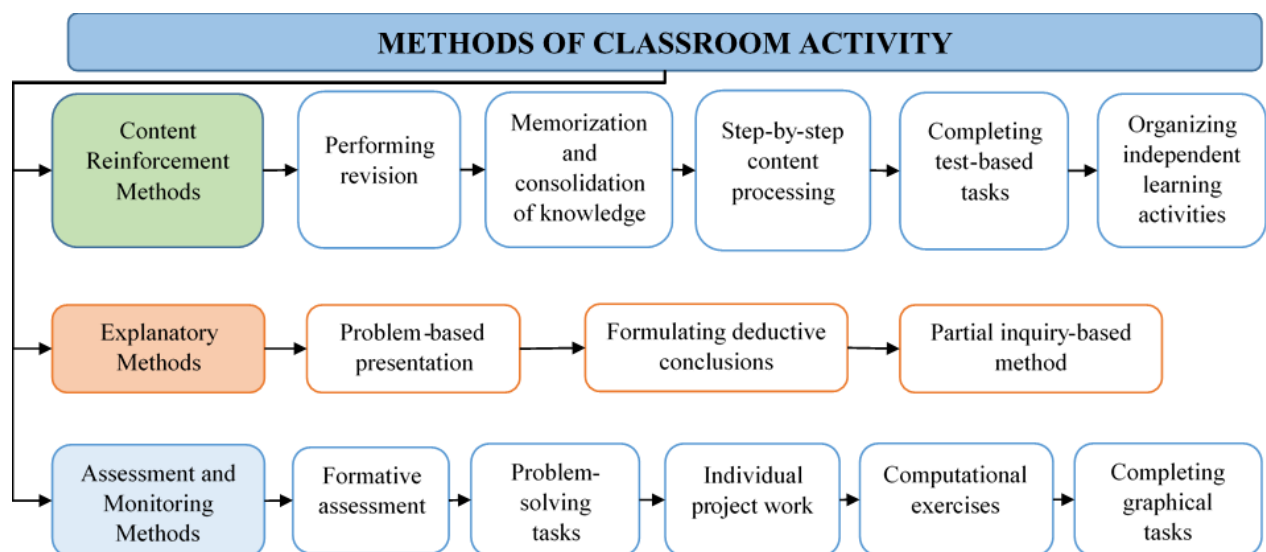


Figure 1. Methods of processing in lesson activities.

This model not only encompasses the main practical and methodological directions organizing the scientific research process but also serves as a tool for

determining the role of information resources in research activities and the attitude toward them. It is also important as a communication platform that creates an environment of effective communication and interactive cooperation between the participants of the pedagogical process.

In this case, methods of problem-based and informative presentation of existing knowledge to achieve the goal, including deductive inference. The formation of logical thinking is achieved through deductive conclusions and heuristic research methods. Furthermore, their systematic use requires significant time from both the teacher and the students. The most important practical research is the heuristic research method, which creates conditions for the logical formation of productive thinking.

The source pays special attention to deductive and heuristic research methods for the development of scientific, creative, and logical abilities.

4. Result-evaluative component.

This component involves determining the level of students' readiness for research activities, monitoring it, and making necessary adjustments to the pedagogical process.

In evaluation, criteria such as working with information, understanding and interpreting scientific context, selecting texts, separating scientific texts, and reformulating them are defined as the main indicators.

This component includes tasks such as evaluating learning outcomes based on all previously defined educational goals of the lesson, analyzing the effectiveness of implemented pedagogical, organizational, and technological resources, studying and analyzing diagnostic results through a monitoring system, and, if necessary, making adjustments to the learning strategy. Through this process, it becomes possible to improve the quality of educational activities and monitor the dynamics of the formation of students' research competence through scientifically grounded criteria. In the study, we identified three levels for determining the criteria for readiness for scientific activity and for forming minor research competence in each discipline: high (exemplary), medium (good), and

high (satisfactory).

The assessment component is aimed at the systematic assessment of pedagogical-psychological experience and testing stages, allowing for the determination and regular monitoring of the level of formation of students' small-scale research competence. These stages are divided into three main levels: high-productive-research, medium-partial-research, and low-reproductive-creative. Each level reflects students' readiness for scientific activity and their potential for independent research [9,10].

The analysis of the results shows that the methodological model is not only a means of final control but also a mechanism for managing the educational process. This is because, based on the diagnostic results, the teacher may make appropriate adjustments to the method, task complexity, digital resource, or learning strategy.

DISCUSSION

The research results show that the formation of students' research competence in the context of digital education is not limited solely to the use of information and communication technologies. The main methodological effectiveness depends on the interconnection of digital tools, pedagogical methods, educational content, and student activity.

From this perspective, an important aspect of the developed model is the sequence and interconnectedness of its components. The research results defined in the target component are concretized through the substantive component, transformed into practical activity through the process component, and the result-evaluative component allows for the diagnosis of the results of this activity and the determination of subsequent pedagogical actions [11,12].

Another important aspect of the model is the combination of individual, group, and collective forms of research activity. Specifically, individual small projects serve to develop students' independent research abilities, group practical sessions develop collaborative skills, and conferences and presentations develop the competence to communicatively express research results.

In the digital educational environment, the use of such forms of activity as the "Literary-Creative Platform" virtual small creative and scientific research laboratory, the "Academy of Young Scientists," "Teacher-Apprentice," "Pyramid of Mastery," "Peer-to-Peer Teacher," and "New Generation Researcher" allows for the connection of research activities with the extracurricular environment.

Furthermore, the gradual integration of educational forms such as Blended Learning, Distance Education, and E-Learning with teacher-apprentice traditions expands methodological opportunities for developing students' research competence.

The result-evaluative component, which occupies a special place in the structure of the model of the methodology for preparing students for research activities in the context of digital education, allows for the effective control, evaluation, and direction of the process of step-by-step preparation through the regulatory filtering of electronic laboratory resources in a differentiated educational environment, the search for new knowledge in a specific field, and scientific work.

In the context of school education, criteria such as working with information, a deep understanding of the scientific context and its interpretation, text selection, and the separation and reformulation of scientific texts are accepted as the main evaluation criteria for developing students' small research skills. These approaches allow for the preparation of students not only for theoretical knowledge but also for practical scientific and creative activity.

Another important aspect is the combination of teaching methods depending on the content and level of complexity of the topic. The constant use of a single method cannot cover all stages of educational activity. For example, the explanatory-illustrative method can be effective in explaining new material, problem-based and heuristic methods in problem analysis, and project and research methods are prioritized in creating practical results [13].

Thus, the methodological logic of the model is expressed in the following sequence:

Goal → Content → Methods and tools → Student's research activity → Monitoring → Assessment → Pedagogical correction → Expected result.

This sequence allows for the organization of the educational process as a closed cycle. The information obtained during the resulting assessment serves as feedback for improving the goals and content of the next educational stage.

At the same time, when evaluating a student's research activity, it is advisable to focus not only on the final product but also on the processes of searching for information, selecting a source, analyzing information, justifying evidence, drawing independent conclusions, and presenting the result.

CONCLUSION

Based on the analysis conducted, the methodological model for preparing students for research activities in the context of digital education was characterized as an integrated pedagogical system. The effectiveness of the model is determined not by its individual elements, but by the interconnection of the goal, content, process, and result-evaluation components.

As a result of the study, the following conclusions were drawn:

In the context of digital education, preparing students for research activities should be considered one of the important methodological directions of general secondary education.

The formation of research competence requires the functioning of the target, substantive, procedural, and result-evaluative components as a unified system.

Literature lessons have important methodological opportunities for developing students' skills in working with text, searching for and sorting information, comparing, analyzing, arguing, and drawing independent conclusions.

An important condition for organizing research activities is the purposeful combination of methods such as explanatory-illustrative, problem-based, deductive, heuristic, project, case study, mental map, SWOT analysis, and graphic organizer.

Individual projects, group practical classes, team conferences, presentations,

creative and scientific laboratories, and virtual platforms allow for the organization of students' research activities in various forms.

When assessing research competence, distinguishing between high-productive-research, medium-partial-research, and low-reproductive-creative levels allows for the observation of student development dynamics.

Using the results of monitoring and diagnostics, pedagogical adjustments to teaching methods, task complexity, and educational strategy increase the practical effectiveness of the model.

In general, the integration of digital educational tools with research-oriented pedagogical methods creates a methodological basis for transforming the student from a subject receiving ready-made knowledge into an active educational subject capable of independent search, information analysis, problem-solving, and justification of their scientific conclusions. The practical effectiveness of the model developed in the study can be determined through pedagogical experimental and diagnostic results; the uploaded material indicates that these results will be covered in detail in the next chapter of the study.

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