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THE ACTIVITY-BASED ASPECT OF TRAINING STUDENTS IN TECHNICAL SPECIALTIES

Abstract

The article examines the activity-based approach to studying the discipline "Methods of Teaching Professional Disciplines" by students majoring in technical specialties. The relevance of shifting the focus from an information-explanatory model of teaching to students' active engagement in learning activities aimed at the practical application of methodological knowledge is substantiated. The purpose of the study is to provide a theoretical justification for the activity-based approach to studying the discipline and to identify the specific features of its implementation in developing future specialists' readiness to organize professionally oriented learning activities.

Based on an analysis of recent studies on the pedagogical training of engineering professionals, the need to combine subject-specific and pedagogical components of professional training is established. The study reveals the specific features of students' active engagement in learning through a combination of mini-lectures and practical tasks, independent development of test items, design and delivery of fragments of learning sessions, peer assessment, and reflection. The process of activity-based learning of the discipline is proposed to be viewed as a sequential cycle: comprehension of theoretical material, performance of a practical

task, creation of an individual learning product, its implementation, peer assessment, reflection, and adjustment of activities. It is established that such an organization of learning facilitates the transition from acquiring methodological knowledge to gaining experience in its practical application and developing future specialists' ability to independently design, implement, and evaluate the learning activities of students in professionally oriented educational contexts. Further research should focus on identifying criteria for assessing the development of such readiness and experimentally verifying the effectiveness of the activity-based organization of learning the discipline.

Keywords: activity-based approach, master's students in technical specialties, methods of teaching professional disciplines, pedagogical activity, active learning, professional training.

Problem Statement

The effectiveness of students' acquisition of academic disciplines largely depends on the extent to which learning activities are personally meaningful to them and on how actively they are engaged in the learning process. The traditional pedagogical model relies to a considerable extent on information-explanatory teaching methods, in which students often remain predominantly passive recipients of ready-made information. Such an organization of the educational process limits opportunities for developing independence, critical thinking, initiative, and the ability to apply acquired knowledge in new situations. In contrast, the implementation of an activity-based approach shifts the focus from the question "What should be taught?" to the question "What activity should students perform in order to acquire the necessary knowledge, skills, and ways of acting?"

A key aspect of such training is the shift from the lecture-and-information-based transmission of educational material toward the organization of students'

activities through which knowledge acquires practical and personal significance. The activity-based approach involves creating conditions for students' active cognitive, practical, research, and communicative engagement. In the context of studying general education disciplines, this means not only acquiring theoretical material but also using it as a tool for analyzing problematic situations, solving cognitive and professionally oriented tasks, designing ways of acting, and evaluating the results obtained.

The activity-based approach is particularly important in the preparation of students at the second (master's) level of higher education in technical specialties. Graduates of higher education institutions may engage not only in their immediate professional activities but also in pedagogical or academic teaching activities in institutions of professional pre-higher and higher education. Therefore, an important component of master's training is the development of the ability to organize the educational process, select appropriate teaching methods and forms, and create conditions for students' active learning.

This situation highlights the importance of the discipline "Methods of Teaching Professional Disciplines," whose content is aimed not only at developing a system of methodological knowledge among future specialists but also at providing them with experience in its practical application when designing and organizing professionally oriented learning activities. In this context, it is essential to align the content of the discipline with the nature of the activities that future teachers are expected to master. A master's student in a technical specialty should not only know teaching methods, forms, and tools but also be able to independently determine appropriate ways of organizing learning activities, design learning tasks, implement them in pedagogical situations, analyze the results, and reflect on their own activities.

Thus, the problem lies in the need to ensure such an approach to studying "Methods of Teaching Professional Disciplines" that future specialists not only

acquire methodological knowledge but also gain the practical experience required to organize the learning of others. The activity-based approach is particularly important in this regard, as its implementation makes it possible to combine the acquisition of methodological knowledge with its practical application, professionally oriented instructional design, and reflective analysis of one's own activities.

Purpose of the Article

The purpose of the article is to provide a theoretical justification for the activity-based approach to studying the discipline "Methods of Teaching Professional Disciplines" by students in technical specialties and to identify the specific features of its implementation in developing future specialists' readiness to organize students' professionally oriented learning activities.

Analysis of Recent Research and Publications

Recent studies demonstrate that a high level of subject-specific competence among teachers of professional disciplines does not, in itself, ensure the effectiveness of the educational process, since teaching professional disciplines also requires pedagogical competence in organizing learning, communicating with students, assessing learning outcomes, and using modern educational technologies.

A systematic review of pedagogical development among educators in higher engineering education conducted by Chen, Du, Jiang, Guerra, and Nørgaard (2024) demonstrates the relevance of purposeful pedagogical development of engineering educators. The authors consider pedagogical development as a comprehensive process associated with the improvement of teaching practices and professional pedagogical competencies.

A separate line of research concerns the pedagogical preparation of graduate teaching assistants in engineering education. Fong, Gilmore, Pinder-Grover, and

Hatcher (2019) examined the impact of teaching development programs for engineering teaching assistants. Research in this area demonstrates the value of specially organized pedagogical preparation for professionals who possess substantial subject-specific knowledge but need to develop practical experience in organizing learning. The authors conclude that pedagogical competence is developed not only through familiarity with theoretical foundations of teaching but also through direct engagement in pedagogical activities.

The importance of a practical orientation in pedagogical preparation is also evident in the study by Shehab et al. (2023), which examined the development of Technological Pedagogical Content Knowledge among graduate teaching assistants in engineering education. The use of the TPACK framework provides grounds for viewing the pedagogical preparation of engineering educators as a process of integrating subject-specific, pedagogical, and technological knowledge. Accordingly, future educators should not only know the content of a professional discipline but also be able to determine appropriate ways of presenting it and organize corresponding learning activities.

A similar issue is addressed by Liu (2022), who focuses on the relationship between subject content, pedagogical approaches to teaching, and educational technologies. This research highlights the need not merely to transmit a body of methodological knowledge to future educators but to develop their ability to independently design learning activities in accordance with the content of a professional discipline and the expected learning outcomes.

In the context of Ukrainian higher education, the pedagogical preparation of master's students in technical fields is addressed in the works of Lysenko (2018, 2020). The researcher focuses on the psychological and pedagogical aspects of professional training of masters in technical fields and on the role of higher education pedagogy within their professional preparation.

Thus, the analysis of the studies reviewed reveals several important trends. First, teaching in engineering education requires specialized pedagogical preparation in addition to strong subject-specific competence. Second, the effectiveness of such preparation is associated with the practical engagement of future educators in pedagogical activities rather than with the acquisition of theoretical knowledge alone. Third, contemporary preparation involves the integration of subject-specific, pedagogical, and technological components.

At the same time, the reviewed studies do not sufficiently specify the organization of activity-based learning for future technical specialists directly within the discipline “Methods of Teaching Professional Disciplines.” Further theoretical elaboration is needed regarding how the study of teaching methodology itself can be organized as a sequence of practically oriented activities, including the analysis of pedagogical situations, identification of learning outcomes, design of learning tasks, selection of teaching methods and forms, microteaching, feedback, and reflection.

Presentation of the Main Material of the Study

The specific nature of the discipline “Methods of Teaching Professional Disciplines” within master’s-level education lies in the dual orientation of its content. On the one hand, students acquire theoretical foundations of teaching, including principles, methods, forms, tools, and technologies for teaching professional disciplines. On the other hand, they need to develop the ability to apply this knowledge in practice when designing and organizing the learning activities of other students. Therefore, the effectiveness of mastering the discipline is determined not so much by the amount of methodological information acquired as by the master’s student’s ability to use this knowledge to solve specific pedagogical tasks.

Under such an organization of learning, the student's role changes. The student is no longer a passive consumer of methodological information but becomes an active subject of learning who independently analyzes pedagogical situations, determines learning objectives and outcomes, selects content and ways of presenting it, designs learning tasks, justifies the choice of teaching methods and forms, and evaluates the results of their own activities.

The professional orientation of learning tasks is particularly important because, within a limited period of study, students need to acquire experience through the simulation of the main types of activities performed by future educators.

For example, when studying teaching methods, students should not merely classify or describe the relevant methods. They should determine which method is appropriate for achieving a specific learning outcome in a professional discipline, justify their choice, and design a fragment of a lesson using the selected method.

In this case, a gradual transition occurs from acquiring methodological knowledge to applying it and subsequently independently constructing ways of pedagogical action. In general, this process can be represented as follows:

methodological knowledge → analysis of a pedagogical situation → design of learning activities → practical implementation → feedback → reflection → adjustment of the mode of action.

This sequence is fundamental to the activity-based organization of learning because it enables students to develop not only knowledge about how teaching can be organized but also the ability to determine what needs to be done to organize effective learning in a specific professionally oriented situation.

An important component of such learning is the creation of situations in which students are required to make independent choices. A ready-made lesson

algorithm or a universal recommendation concerning the use of a particular method does not fully ensure the development of methodological competence. In contrast, a problem-based or variable task requires students to analyze the conditions, identify possible ways of acting, select the most appropriate one, and justify their choice. It is through this process of decision-making that future educators develop the ability to adapt teaching methodology to the content of a professional discipline, the level of students' preparation, and the intended learning outcomes.

Thus, the activity-based approach within the discipline "Methods of Teaching Professional Disciplines" involves organizing an educational process in which master's students gradually move from the position of recipients of methodological knowledge to that of subjects of pedagogical activity. An important outcome of this transition is not the mechanical reproduction of established methodological recommendations but the ability to independently design, implement, evaluate, and improve professionally oriented learning activities.

Active Engagement of Students as a Basis for Implementing the Activity-Based Approach

The implementation of the activity-based approach in studying "Methods of Teaching Professional Disciplines" requires a fundamental change in the role of students in the educational process. Whereas under an information-explanatory model students primarily perceive, record, and reproduce educational information, the activity-based approach involves their active engagement in tasks that require independent understanding of content, decision-making, creation of their own educational products, and evaluation of the results of their activities.

Students' active engagement within this discipline can be understood as the purposeful organization of their activities at different stages of mastering the

educational material. What matters is not merely ensuring activity as an external characteristic of a lesson, but creating situations in which students must perform specific actions necessary to achieve defined learning outcomes. In this case, activity is not an end in itself but a mechanism for acquiring experience in pedagogical activity.

For this purpose, the study of the discipline can combine short information-based presentations or mini-lectures with practical tasks that directly involve students in applying the information obtained. In such an organization of learning, the mini-lecture is not a completed act of knowledge transmission. Instead, it provides the informational basis for subsequent activities: analyzing a pedagogical situation, identifying a problem, formulating learning outcomes, developing tasks, selecting teaching methods and forms, or designing a fragment of a professionally oriented lesson.

An important means of active engagement is students' development of their own tasks for checking their understanding of the material. In particular, while studying individual topics, students can independently formulate test questions and tasks for their peers. This activity has a dual pedagogical effect. First, in order to create a high-quality task, students must understand the content of the material, identify its key elements, and determine what exactly should be assessed. Second, they effectively perform a specific function of a teacher by selecting content and designing an assessment tool.

A further level of active engagement involves students' preparation and delivery of fragments of learning sessions. In this case, students move from the position of those who study teaching methodology to the position of those who apply it in practice. Preparing such a fragment requires defining the expected learning outcome, selecting relevant content, choosing teaching methods and tools, planning the sequence of teacher and student actions, and determining how the achieved results will be assessed.

Of particular importance is the mini-practical session in which one student assumes the role of the teacher while the others act as students. This format creates a learning situation that closely resembles future pedagogical practice while providing a safe environment for experimenting with teaching methods and forms. Students have the opportunity not only to demonstrate the results of their preparation but also to directly test the appropriateness of their chosen approach to organizing learning activities.

Discussion and peer assessment are important components of this process. After a fragment of a learning session has been delivered, peers analyze its content, structure, logical organization, alignment with the intended learning outcomes, appropriateness of the methods used, and the nature of participants' engagement. The object of assessment is not the student's personality but the activity performed and its results. Such an approach contributes to the development of the ability to view the learning process from the teacher's perspective while simultaneously critically analyzing one's own pedagogical decisions.

Reflection is the final element of this activity cycle. Students should not only receive an assessment of the task performed but also independently determine what was successful, what difficulties arose, how well the selected ways of acting corresponded to the intended objective, and what should be changed if the task were performed again. The reflective stage transforms immediate experience into conscious experience of activity and creates the basis for its further improvement.

Conclusions

The study provides grounds for considering the activity-based approach as an important basis for organizing the study of "Methods of Teaching Professional Disciplines" by students in technical specialties. Its essence lies not merely in the use of individual active or interactive teaching methods but in a systematic

transformation of the nature of students' learning activities—from predominantly receiving and reproducing methodological information to independently applying, designing, implementing, evaluating, and improving it.

It has been established that the specificity of the activity-based approach to studying this discipline is determined by the dual position of a master's student in a technical specialty. On the one hand, the student is a learner who must acquire methodological knowledge and professional ways of acting; on the other hand, the student is a future educator capable of organizing the learning activities of other students. Therefore, the content and forms of learning should ensure not only the acquisition of theoretical principles of pedagogy and teaching methodology but also direct experience of pedagogical activity.

The expediency of organizing the learning process as a sequential activity cycle has been substantiated:

Further research should focus on identifying criteria and indicators for assessing the development of technical master's students' readiness to organize students' learning activities and on empirically testing the effectiveness of the proposed activity-based organization of learning the discipline.

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