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Development of Criteria and Indicators for Assessing The Methodological Preparedness of Future Primary School Teachers to Use The “Flipped Learning” Model

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Abstract: In today's higher pedagogical education system, assessing the readiness of prospective teachers to use innovative educational technologies is one of the key factors in ensuring educational quality. In particular, the widespread implementation of the Flipped Learning model necessitates a scientifically-based determination of the level of methodological preparedness for its use. While existing research primarily highlights the advantages of Flipped Learning technology and its application methodology, the issue of developing criteria and indicators to assess the methodological preparedness of future primary school teachers to use this model has not been sufficiently studied. This article develops the criteria, indicators, and levels for assessing the methodological preparedness of future primary school teachers to use the Flipped Learning model. Methodological preparedness is described based on motivational, cognitive, activity-related, and reflective components, and evaluation indicators for each component are systematized. The developed assessment system was applied during experimental work, and its potential for practical application was analyzed. The research results showed that the proposed assessment criteria allow for a comprehensive determination of the level of methodological preparedness, monitoring of students' developmental dynamics, and the making of scientifically-grounded pedagogical decisions to improve methodological training. This assessment system holds practical significance for monitoring and increasing the effectiveness of the training process for using the Flipped Learning model in pedagogical higher education institutions.

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1. Introduction

The reforms being implemented in the higher education system are setting new requirements for the content and quality of pedagogical training. A modern teacher must not only have a perfect command of the subject matter but also be able to appropriately select, design, and effectively apply innovative pedagogical technologies in the educational process. From this perspective, the Flipped Learning model is recognized as one of the promising pedagogical approaches that contributes to the modern organization of the professional activities of future teachers.[1]

The effective application of the Flipped Learning model is directly linked to the methodological preparedness of prospective teachers. Methodological preparedness encompasses not only theoretical knowledge of this technology but also the skills to adapt it to the educational process, design lessons, use digital educational resources, integrate classroom and extracurricular activities, and evaluate learning outcomes. Therefore,

assessing methodological preparedness is a crucial component in determining the quality of professional training for future teachers.[2][3]

An analysis of scientific literature shows that many studies on Flipped Learning technology have examined its didactic potential, impact on the learning process, and effectiveness on learning outcomes. However, the issue of developing criteria, indicators, and assessment levels for a comprehensive evaluation of the methodological preparedness of future primary school teachers to use this model has not been sufficiently addressed. As a result, the assessment of methodological preparedness in pedagogical higher education institutions is conducted based on various approaches, which creates certain difficulties in ensuring the objectivity of the results.[4][5]

Solving this problem requires identifying the structural components of methodological preparedness, developing assessment criteria for them, and scientifically substantiating the practical indicators for each criterion. The scientific validity of the assessment system not only helps in determining the level of development of methodological preparedness but also expands the opportunities for making pedagogical decisions to improve the educational process.[6][7]

The aim of the research is to develop criteria, indicators, and levels for assessing the methodological preparedness of future primary school teachers to use the Flipped Learning model, and to scientifically substantiate their significance in pedagogical diagnostics.[8]

2. Materials and Methods

Theoretical and Methodological Foundations for Assessing Methodological Preparedness. Assessing the professional preparedness of prospective teachers is of particular scientific and practical importance in ensuring the quality of pedagogical education. Assessment is not the final stage of the pedagogical process but rather a continuous diagnostic mechanism that serves to improve educational content, select teaching methods, and manage learning outcomes. For this reason, in modern pedagogical research, the assessment system is interpreted not merely as a tool for recording learning outcomes, but as an essential component of managing educational quality.[9]

Methodological preparedness is a complex, integrative pedagogical phenomenon that embodies a prospective teacher's knowledge, practical skills, professional motivation, and reflective practice in using innovative educational technologies. The assessment of this phenomenon is not limited to verifying theoretical knowledge. On the contrary, a reliable assessment of methodological preparedness requires identifying its constituent components, substantiating their interrelationships, and developing observable indicators that characterize each component.[10]

Although the concepts of "criteria" and "indicators" are inextricably linked in the theory of pedagogical diagnostics, their functional roles are considered distinct. While a criterion expresses the fundamental qualitative characteristic of the pedagogical phenomenon being evaluated, an indicator is a specific sign that describes the practical manifestation of this quality. Therefore, when developing a system for assessing methodological preparedness, it is first necessary to determine its conceptual structure and subsequently develop practical indicators for each criterion.[11]

International research presents various approaches to assessing the professional preparedness of teachers. While some researchers propose assessment based solely on professional competencies, others recognize motivational and reflective factors as an integral part of the assessment system. However, an analysis of studies on assessing methodological preparedness for using the Flipped Learning model reveals that a unified system of assessment criteria has not been established in existing works. Although teachers' digital literacy or skills in using technology are often assessed, methodological decision-making, lesson design, and reflective practice are not sufficiently taken into account.[12]

During this research, an integrative model for assessing methodological preparedness was developed, based on the principles of the competency-based approach, the activity-

oriented approach, and reflective pedagogy. This model characterizes methodological preparedness through four interconnected components: motivational, cognitive, activity-based, and reflective. This approach ensures that methodological preparedness encompasses not only theoretical knowledge but also the ability to organize and analyze professional activity.

The **motivational component** characterizes a prospective teacher's professional interest in using the Flipped Learning model, their readiness to master innovative pedagogical technologies, and their aspiration for professional development. This component serves as the internal driving force of methodological preparedness and directly influences the formation of the other components.

The **cognitive component** forms the theoretical basis of methodological preparedness. It includes a system of knowledge about the didactic principles of the Flipped Learning model, the methodology for designing lessons, the development of educational content, and modern pedagogical technologies. The level of development of this component directly affects the quality of subsequent practical activity.

The **activity-based component** is the practical expression of methodological preparedness. It describes a prospective teacher's professional skills in planning lessons based on Flipped Learning, selecting digital educational resources, organizing independent learning activities, applying interactive methods, and evaluating learning outcomes. It is this component that makes it possible to determine the practical effectiveness of methodological preparedness.

The **reflective component**, in turn, expresses a teacher's readiness to analyze their own methodological activity, identify emergent problems, evaluate the effectiveness of pedagogical decisions, and improve their practice. In modern pedagogical theories, reflection is regarded as one of the key factors in professional development. For this reason, it has been designated as an independent component of the methodological preparedness assessment system.

In this study, the assessment system for methodological preparedness was developed based on the mutual integration of these four components. Observable indicators, assessment criteria, and developmental levels have been established for each component. Such an approach allows methodological preparedness to be assessed as a holistic pedagogical system rather than as separate elements.

Development of Criteria and Indicators for Assessing the Methodological Preparedness of Prospective Primary School Teachers to Use the "Flipped Classroom" Model

One of the most critical tasks in assessing the methodological preparedness of prospective primary school teachers to use the "flipped classroom" model is establishing scientifically-grounded evaluation criteria and indicators. The complexity of pedagogical phenomena does not permit their evaluation based on a single indicator. Therefore, it is necessary to study methodological preparedness as a multi-component system and to characterize each of its components through distinct criteria.[13]

During the research, the content, structure, and characteristics of methodological preparedness in pedagogical activity were analyzed, and four main evaluation criteria were developed. These criteria serve to provide a comprehensive overview of the internal and external aspects of methodological preparedness and align with the principles of systematicity, consistency, and objectivity in pedagogical diagnostics.

The first is the motivational criterion, which characterizes prospective teachers' intrinsic need to use the "flipped classroom" model, their professional interest, and their positive attitude toward innovative pedagogical activities. This criterion forms the psychological foundation of methodological preparedness. Within the framework of the motivational criterion, students' motivation to learn new pedagogical technologies, readiness for professional development, attitude toward independent learning, and the need to improve their professional activities were assessed. The analysis showed that the successful formation of methodological preparedness is, first and foremost, closely linked to the student's internal motivation.

The second is the cognitive criterion, which describes the theoretical foundation of methodological preparedness. This criterion is used to ascertain students' knowledge of the didactic essence of the "flipped classroom" model, its pedagogical principles, the stages of lesson design, the possibilities for using digital educational tools, and assessment methods. In this context, an important indicator is considered to be not only the level of theoretical knowledge but also the readiness to apply it in practical situations. Therefore, the cognitive criterion is one of the primary criteria that characterizes the content component of methodological preparedness.[14]

The third is the activity-based criterion, which reflects the practical application of methodological preparedness. This criterion evaluates students' skills in designing lessons based on the "flipped classroom" model, developing educational content, preparing video lessons and electronic resources, organizing classroom sessions using interactive methods, and managing the educational process. This criterion makes it possible to determine the extent to which theoretical knowledge is demonstrated in actual pedagogical activity. The research results showed that the activity-based criterion is one of the most important diagnostic factors in determining the level of methodological preparedness.

The fourth is the reflective criterion, which signifies prospective teachers' readiness to analyze their methodological activities, evaluate the effectiveness of their pedagogical decisions, and improve their practice. In modern pedagogical approaches, reflection is recognized as a key mechanism for professional development. Therefore, this criterion was evaluated by the student's ability to identify achievements and shortcomings in their work, analyze them, and plan their future pedagogical activities. The inclusion of the reflective criterion in the assessment system made it possible to analyze methodological preparedness not only from the perspective of its current state but also in terms of its developmental prospects.

To clarify the content of each criterion, a system of observable indicators was developed for them. These indicators represent the externally manifested signs of methodological preparedness and serve to ensure the objectivity of the assessment results. Their selection was based on the principles of observability, measurability, practical applicability, and diagnostic significance. As a result, indicators were formulated for each criterion that can be identified through pedagogical observation, tests, practical assignments, project work, micro-teaching results, reflective writing, and electronic portfolios.

The developed criteria and indicators were integrated with a three-level assessment system to determine the level of methodological preparedness. The reproductive level is characterized by performing methodological activities based on examples, limited independence, and a superficial application of theoretical knowledge. The constructive level reflects the ability to independently apply methodological knowledge, plan lessons, and make decisions appropriate for pedagogical situations. The creative level entails the creative application of the "flipped classroom" model, the development of new didactic solutions, and the critical analysis of methodological activities.

Table 1. Criteria and Indicators for Assessing Future Primary School Teachers' Methodological Readiness to Implement the Flipped Learning Model

Assessment Criterion	Key Indicators	Assessment Methods
Motivational	Professional interest; positive attitude toward innovative teaching practices; willingness to engage in self-directed learning	Questionnaire; semi-structured interview
Cognitive	Theoretical knowledge; ability to apply methodological concepts in educational contexts	Knowledge tests; written assignments

Activity-Based	Lesson planning; use of digital educational resources; application of interactive teaching methods	Practical tasks; microteaching sessions
Reflective	Self-analysis of teaching practice; identification of instructional shortcomings; development of improvement strategies	Reflective essays; teaching portfolio; expert evaluation

3. Result and Discussion

To determine the practical significance of the developed evaluation criteria and indicators, pedagogical experiments were conducted in higher education institutions that train future primary school teachers. During the research, the motivational, cognitive, activity-related, and reflective components of methodological preparedness were evaluated using the developed diagnostic tools. The assessment results allowed for an analysis of the students' level of methodological preparedness, not only in its final state but also in terms of its developmental dynamics.

Initial diagnostic results revealed significant disparities among students across all components of methodological preparedness. In particular, a high proportion of students at the reproductive level was observed for the activity-related and reflective components. This indicated that although future teachers possessed theoretical knowledge of innovative pedagogical technologies, their skills in applying this knowledge to design and organize practical sessions were not sufficiently developed. Furthermore, the development level of reflective skills for analyzing and improving their own methodological activities was also found to be relatively low.

The regular use of the evaluation system developed during the experiment made it possible to monitor the developmental dynamics of methodological preparedness. The data obtained for each criterion served as a basis for improving the educational process, providing individual methodological support, and making necessary adjustments to the educational content. The assessment results not only recorded the achievements of the students but also helped identify which components of methodological preparedness required additional pedagogical intervention.

The results of the final diagnostics indicated positive changes across all criteria of methodological preparedness. Specifically, regarding the activity-related criterion, there was a significant improvement in students' skills in designing lessons based on the "flipped classroom" model, developing educational content, and organizing classroom sessions using interactive methods. Positive dynamics were also observed for the reflective criterion, as students began to analyze their methodological activities, identify existing shortcomings, and draw specific conclusions to address them.

The obtained results also demonstrated the interconnectedness of the evaluation criteria and indicators. The development of the motivational component positively influenced the increase in cognitive preparedness, while the consolidation of theoretical knowledge contributed to the development of activity-related skills. In turn, increased practical experience improved the quality of reflective analysis, forming a continuous development cycle among all components of methodological preparedness. This situation confirms the necessity of evaluating methodological preparedness not as a collection of separate elements, but as an integrated pedagogical system.

A comparison of the results with approaches presented in the scientific literature shows that in most foreign studies, the effectiveness of Flipped Learning technology was primarily evaluated through student learning outcomes or academic activity. However, systematic approaches aimed at a comprehensive assessment of methodological preparedness based on motivational, cognitive, activity-related, and reflective components are rare. The distinctive feature of this study is that the assessment process was organized as a unified diagnostic system encompassing all components of methodological preparedness.

The discussion results showed that applying a scientifically-grounded system of evaluation criteria and indicators significantly increases the effectiveness of managing the pedagogical process. By regularly monitoring the students' level of methodological preparedness, the instructor gains the ability to determine individual development trajectories, differentiate methodological support, and adapt the educational content to meet learning needs. This enhances not only the control function of assessment but also its developmental and managerial functions.[15]

Thus, the experimental results confirmed the effectiveness of the developed system of evaluation criteria and indicators in the process of pedagogical diagnostics. The proposed system can be recommended as an effective diagnostic tool for objectively determining the level of development of methodological preparedness, monitoring its dynamics, and improving the educational process on a scientific basis.

Table 2. Practical Functions of the Methodological Readiness Assessment System

Assessment Stage	Information Obtained	Pedagogical Decision
Initial Assessment	Baseline level of students' methodological readiness	Identification of individual professional development needs
Formative Assessment	Dynamics of methodological readiness development	Adjustment of instructional methods and learning support strategies
Summative Assessment	Final level of methodological readiness achieved	Evaluation of instructional effectiveness and formulation of recommendations for further professional development

4. Conclusion

This study developed criteria and indicators for assessing the methodological readiness of prospective primary school teachers to use the Flipped Learning model. The proposed assessment system allows for a comprehensive evaluation of the motivational, cognitive, activity-based, and reflective components of this methodological readiness.

The experimental results demonstrated that the developed criteria and indicators are an effective tool for determining the level of methodological readiness, monitoring its developmental dynamics, and making scientifically-grounded pedagogical decisions to improve the educational process. The application of this assessment system not only enables the objective determination of students' methodological readiness but also facilitates the identification of their individual developmental needs.

The findings of this study hold practical significance for monitoring the quality of training for prospective primary school teachers in pedagogical higher education institutions and for enhancing the system of assessing methodological readiness. A promising future research direction involves integrating this assessment system with artificial intelligence-based educational analytics, e-portfolios, and digital monitoring tools.

REFERENCES

- [1] J. Bergmann and A. Sams, *Flip Your Classroom: Reach Every Student in Every Class Every Day*. Eugene, OR, USA: International Society for Technology in Education, 2012.
- [2] J. Biggs and C. Tang, *Teaching for Quality Learning at University*, 4th ed. Maidenhead, U.K.: Open University Press, 2011.
- [3] R. M. Branch, *Instructional Design: The ADDIE Approach*. New York, NY, USA: Springer, 2009.
- [4] C. J. Brame, *Flipping the Classroom*. Nashville, TN, USA: Vanderbilt University Center for Teaching, 2016.
- [5] C. R. Graham, "Current research in blended learning," in *Handbook of Open, Distance and Digital Education*, 2021.

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- [6] K. F. Hew and C. K. Lo, "Flipped classroom improves student learning in health professions education: A meta-analysis," *BMC Medical Education*, vol. 18, no. 38, pp. 1–12, 2018.
 - [7] C. K. Lo and K. F. Hew, "A critical review of flipped classroom challenges in higher education: The past, present, and future," *Educational Technology Research and Development*, vol. 71, no. 5, pp. 2143–2168, 2023.
 - [8] M. D. Merrill, *First Principles of Instruction*. San Francisco, CA, USA: Pfeiffer, 2018.
 - [9] Organisation for Economic Co-operation and Development (OECD), *Teachers and Teaching in a Changing World*. Paris, France: OECD Publishing, 2023.
 - [10] R. Talbert, *Flipped Learning: A Guide for Higher Education Faculty*. Sterling, VA, USA: Stylus Publishing, 2017.
 - [11] UNESCO, *Global Education Monitoring Report 2023*. Paris, France: UNESCO Publishing, 2023.
 - [12] L. K. Hamidova, *Developing the Methodological Preparation of Prospective Primary School Teachers for Using the "Flipped Learning" Model*, Ph.D. dissertation, Samarkand State University, Samarkand, Uzbekistan, 2026.
 - [13] J. L. Bishop and M. A. Verleger, "The flipped classroom: A survey of the research," in *Proc. 120th ASEE Annual Conference & Exposition*, Atlanta, GA, USA, 2013, pp. 1–18.
 - [14] J. Hattie, *Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement*. London, U.K.: Routledge, 2009.
 - [15] R. E. Mayer, *Multimedia Learning*, 3rd ed. Cambridge, U.K.: Cambridge University Press, 2021.