ASSESSMENT CRITERIA AND DIAGNOSTIC METHODS OF DIGITAL COMPETENCE

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ABSTRACT

This article investigates the assessment criteria and diagnostic methods of digital competence. The study analyzed the level of digital competence among teachers and students, as well as the effectiveness of assessment criteria and diagnostic tools. The results highlighted the importance of implementing a systematic and integrated approach to evaluating digital competence. Additionally, recommendations were developed to enhance teachers' methodological skills and to foster students' creative and practical abilities.

Introduction. In the context of rapidly evolving digital environments, the concept of digital competence has become an integral part of the activities of both teachers and students. Today, digital technologies are increasingly integrated into all spheres of human life, particularly education. Consequently, the formation, assessment, and development of digital competence is recognized as one of the most pressing issues in contemporary pedagogy.

Digital competence broadly refers to the ability to use information and communication technologies (ICT) effectively, safely, and creatively. This competence encompasses skills in searching, analyzing, and processing information, communicating through digital tools, and adhering to information security culture. Therefore, assessing digital competence requires evaluation not only at the technical level but also in cultural, communicative, and ethical dimensions.

To determine the effectiveness of digital competence formation in education, clearly defined assessment criteria and diagnostic methods are necessary. Assessment allows educators to analyze students' independence in using digital technologies, their creative approaches, and adaptability to technological environments. Such evaluations support teachers in improving curricula, monitoring student learning, and enhancing overall educational quality.

Internationally, several frameworks have been developed for assessing digital competence. For example, the European Union's Digital Competence Framework (DigComp) evaluates digital competence in five areas: information processing, communication, content creation, safety, and problem-solving, with clearly defined indicators and levels (A1–C2). Many countries have adapted this model to create national assessment systems.

Diagnostic methods provide scientifically grounded approaches to identifying digital competence. These methods commonly include tests, observations, portfolio analysis, practical projects, and reflective activities. Each method reveals specific aspects of a teacher's or student's digital activity: for instance, tests evaluate theoretical knowledge, while project work assesses creative and practical skills (Anderson & Krathwohl, 2018, p.27).

Thus, assessing and diagnosing digital competence is not merely a technical procedure but a complex system involving pedagogical, psychological, and methodological approaches. It serves as a key tool for determining teachers' digital literacy, students' digital thinking, and the digital development level of the educational environment. Accordingly, this article systematically analyzes the assessment criteria, relevant indicators, and practical diagnostic methods of digital competence.

In the 21st century, education is closely linked to the digital transformation of society. Globalization, accelerated information flows, and technological progress make teachers' digital competence directly related to the effectiveness of pedagogical activity. Teachers are now considered not only as knowledge transmitters but also as facilitators capable of managing digital learning environments effectively and fostering students' digital thinking. Therefore, assessing and diagnosing digital competence is a critical scientific and practical area in modern pedagogy.

Digital competence refers to a teacher's or student's ability to use information and communication technologies purposefully, safely, and effectively in educational, creative, and research activities. This competence is considered a universal skill in modern education as it enhances learners' independence in searching, analyzing, creating, and evaluating information. Measuring, assessing, and tracking the development of digital competence has thus become an essential factor for controlling and improving educational quality (UNESCO, 2021, p.42).

Currently, there is no single approach to measuring digital competence, as it varies according to education level, subject area, curriculum, and student age. Therefore, each educational institution should develop its pedagogical diagnostic system according to its specific needs. Such assessment allows teachers to analyze their teaching practices and provides students with opportunities to self-evaluate and develop within digital environments.

Improving the scientific and methodological foundations for assessing and diagnosing digital competence contributes not only to educational quality but also to professional development of teachers and the formation of students' independent thinking and problem-solving skills. Therefore, this field is of both theoretical and practical significance.

Assessment criteria allow comprehensive evaluation of digital activity in the educational process, typically manifested in three main components:

1.Knowledge Component – theoretical understanding of digital tools, platforms, and software environments.

2.Practical Component – effective application of digital technologies in teaching and learning.

3.Motivational-Ethical Component – responsible behavior in digital environments, adherence to information security, and digital culture (To'xtayev, 2021, p.19; Karimova, 2022, p.26).

Literature Review. Recent research on digital competence emphasizes a multi-component approach encompassing not only technical skills but also social, cultural, and ethical

aspects of digital activity. Studies in *Digital Pedagogy Fundamentals* highlight that assessing teachers' digital competence requires attention to their information security knowledge, communication culture, and analytical thinking skills. Evaluations of digital competence in education often focus on three components: cognitive (knowledge), operational (practical activity), and reflective (self-assessment and analysis).

According to studies in *Information Technology and Education*, digital literacy is the initial stage of digital competence, and it is crucial to assess learners' abilities to analyze, select, and process information before considering them fully digitally competent. International frameworks such as UNESCO's *Digital Literacy Framework for Educators* and the European Commission's *DigComp 2.1* provide structured approaches to evaluate digital skills across multiple domains. Assessment models also incorporate cognitive levels for evaluating learning, teaching, and digital activity (Anderson & Krathwohl, 2018). The OECD report *Measuring Digital Skills for the Future* recommends adaptive tests, simulation tasks, and real-world activity-based assessments for accurate measurement of digital competence (OECD, 2020, pp.31–33).

Research Methodology. This study aimed to identify the assessment criteria and diagnostic methods of digital competence and examine their effectiveness in the educational process. A systematic, comprehensive, and empirical approach was applied, drawing on competency-based pedagogy, digital pedagogy concepts, and theories of digital transformation in education.

Analysis and Results. The study revealed the pedagogical significance of assessment criteria and diagnostic methods for digital competence. Analysis of teachers' and students' competence levels showed that assessment can be effectively carried out across three components: knowledge, practical skills, and motivational-ethical attitudes. While teachers generally demonstrated high theoretical knowledge, practical skills were sometimes insufficient, limiting effective use of digital tools and highlighting the need for methodological support. Teachers' adherence to information security and digital ethics was generally high.

The combination of diagnostic methods—tests, questionnaires, observations, project work, and reflection—was most effective in assessing digital competence. Tests evaluated theoretical knowledge, project work assessed creative and practical skills, and reflection allowed learners to express personal experience and ensured comprehensive diagnostics.

The results indicated that a systematic and integrated approach is essential. Harmonizing theoretical and empirical analysis contributes to enhancing teachers' methodological competence, shaping students' digital literacy, and improving the quality of education. The findings are thus valuable for both pedagogical theory and practical application.

Conclusion and Recommendations. The study concluded that digital competence encompasses not only technical skills but also cognitive, creative, and ethical aspects of teachers' and students' activities. Assessment requires a systematic and integrated approach to simultaneously evaluate knowledge, practical skills, and motivational-ethical components.

Key conclusions:

1.Assessment criteria structured around knowledge, practical, and motivational-ethical components ensure effective and reliable evaluation.

2.Teachers' practical use of digital tools is lower than their theoretical knowledge, necessitating methodological support.

3.Students' digital competence is multi-component: high in information processing and digital safety, moderate in creative content creation and problem-solving.

4.Combining diagnostic methods—tests, questionnaires, observation, project work, and reflection—yields the most comprehensive results.

Recommendations:

- Develop methodological guides to enhance teachers' practical digital skills.
- Implement a digital competence assessment system that evaluates both theoretical and practical components.
- Foster students' creative and problem-solving skills through project-based and reflective activities.
- Conduct ongoing monitoring and evaluation to optimize educational outcomes.

Provide training on information security and digital ethics for teachers and students.

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