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CRITERIA, INDICATORS, AND LEVELS FOR ASSESSING STUDENTS' CRITICAL THINKING COMPETENCE.

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Abstract. This article examines the theoretical and methodological foundations for assessing students' critical thinking competence in contemporary educational environments. Particular attention is paid to identifying assessment criteria, measurable indicators, and developmental levels that reflect students' abilities to analyze information, evaluate evidence, construct logical arguments, identify assumptions, solve problems, and formulate well-reasoned conclusions. The study employs theoretical analysis, comparative analysis, synthesis, classification, and pedagogical modeling to develop a comprehensive framework for evaluating critical thinking competence. Drawing upon contemporary educational approaches and established theories of critical thinking, the article proposes a multidimensional assessment model consisting of cognitive-analytical, evaluative, argumentative, reflective, and practical components. A four-level assessment scale—low, basic, proficient, and advanced—is introduced to describe students' progression from limited analytical performance to independent and evidence-based reasoning.

Keywords: critical thinking competence, assessment criteria, performance indicators, competency levels, higher-order thinking skills, analytical reasoning, evidence evaluation, reflective thinking, educational assessment, competency-based education, pedagogical diagnostics.

Introduction. The rapid development of information technologies, digital communication systems, artificial intelligence, and knowledge-based economies has significantly transformed the competencies required of students in contemporary educational institutions. Modern education is increasingly expected to prepare individuals not only to acquire theoretical knowledge but also to analyze complex information, evaluate competing perspectives, recognize unreliable evidence, and make independent decisions.

Among the essential competencies of the twenty-first century, critical thinking occupies a particularly important position. It enables students to interpret information objectively, identify logical relationships, assess the credibility of sources, formulate reasoned arguments, and solve unfamiliar problems.

Critical thinking is not limited to the ability to criticize information or express disagreement. Rather, it represents a purposeful and reflective intellectual process through which individuals evaluate evidence, examine assumptions, consider alternative explanations, and reach justified conclusions.

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In higher education, critical thinking competence is essential for academic research, professional decision-making, problem-solving, and lifelong learning. Students with well-developed critical thinking skills are better equipped to distinguish facts from opinions, evaluate scientific claims, identify logical inconsistencies, and apply knowledge in unfamiliar contexts.

However, assessing critical thinking competence presents significant methodological challenges. Traditional assessment methods often emphasize factual recall, reproduction of theoretical information, and the completion of routine exercises. Although these methods may measure subject knowledge, they do not necessarily provide sufficient evidence of students' analytical reasoning, evaluative judgment, or reflective abilities.

Consequently, educational institutions require assessment systems that incorporate clearly defined criteria, observable performance indicators, and differentiated competence levels.

A comprehensive assessment framework should answer three fundamental questions: What dimensions of critical thinking should be assessed? Which observable behaviors demonstrate the development of these dimensions? How can different levels of critical thinking performance be distinguished?

The purpose of this study is to theoretically substantiate and develop a structured framework of criteria, indicators, and developmental levels for assessing students' critical thinking competence in higher education.

The study addresses the following objectives:

1. To examine the theoretical foundations and structural components of critical thinking competence.
2. To identify criteria and measurable indicators for evaluating students' critical thinking performance.
3. To establish differentiated developmental levels of critical thinking competence.
4. To propose a criterion-referenced assessment rubric.
5. To formulate pedagogical recommendations for implementing critical thinking assessment in educational practice.

The scientific significance of the study lies in the development of an integrated assessment framework that connects theoretical constructs with observable student performance.

Literature review. Critical thinking has been extensively investigated in educational psychology, philosophy, cognitive science, and pedagogical research. Scholars have proposed various conceptual approaches emphasizing reasoning, judgment, evidence evaluation, reflection, and intellectual independence.

One of the influential theoretical foundations was developed by Robert Ennis, who characterized critical thinking as reasonable and reflective thinking focused on deciding what to believe or do. This approach highlights the relationship between logical reasoning, reflective judgment, and decision-making.

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Peter Facione's Delphi Report (1990) identified interpretation, analysis, evaluation, inference, explanation, and self-regulation as central cognitive skills associated with critical thinking. These dimensions remain influential in the design of educational assessment instruments.

Richard Paul and Linda Elder emphasized the importance of intellectual standards such as clarity, accuracy, relevance, logical consistency, depth, breadth, and fairness. Their framework provides a conceptual foundation for evaluating the quality of students' reasoning.

Recent educational research has expanded the discussion by examining critical thinking within competency-based education, digital learning environments, and contemporary assessment practices.

Van Laar et al. (2020) examined the determinants of twenty-first-century digital skills and highlighted the importance of higher-order cognitive competencies in technology-rich environments. Their findings are relevant to critical thinking assessment because students increasingly evaluate and interpret information through digital platforms.

Howard et al. (2024) discussed artificial intelligence literacy and the competencies required to interact meaningfully with AI-based systems. Their work provides a broader context for assessing students' ability to question and evaluate information generated by intelligent technologies.

The reviewed literature suggests that critical thinking assessment should move beyond isolated knowledge tests toward multidimensional evaluation systems incorporating authentic tasks, transparent rubrics, reflective activities, and evidence-based judgments. Nevertheless, a key methodological challenge remains: translating abstract critical thinking constructs into specific, measurable indicators that can be consistently applied by educators.

Results and discussion. The theoretical analysis supports conceptualizing critical thinking competence as a multidimensional construct involving cognitive, evaluative, argumentative, reflective, and practical processes. These components are interrelated and contribute to students' ability to make reasoned judgments in complex educational situations.

Table 1. Criteria and indicators for assessing students' critical thinking competence

Assessment criteria	**Key indicators**	**Expected performance**
Cognitive-analytical	Identifying problems, distinguishing relevant information, recognizing relationships	Accurate analysis of information and problem structure
Evaluative	Assessing source credibility, identifying bias, examining evidence	Evidence-based evaluation of information
Argumentative	Constructing arguments, identifying assumptions, addressing counterarguments	Logical and well-supported reasoning
Reflective	Recognizing errors, reconsidering assumptions, evaluating one's reasoning	Self-correction and reflective judgment
Practical decision-	Comparing alternatives, anticipating	Reasoned application of critical

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making	consequences, justifying solutions	thinking to real-world problems

The proposed criteria reflect complementary dimensions of critical thinking competence.

The cognitive-analytical criterion concerns students' ability to understand and organize information. The evaluative criterion emphasizes evidence quality and source reliability. The argumentative criterion focuses on reasoning and justification. The reflective criterion addresses self-regulation, while the practical criterion evaluates the application of critical thinking in decision-making situations.

The cognitive-analytical criterion evaluates students' ability to identify the essential components of information, recognize logical relationships, and analyze complex problems. Its indicators include distinguishing relevant from irrelevant information, identifying main ideas, recognizing cause-and-effect relationships, and interpreting data.

For example, students may be presented with a scientific article containing multiple claims and asked to identify its research question, main argument, supporting evidence, and limitations.

A student demonstrating advanced cognitive-analytical competence should be able to distinguish the author's conclusions from the evidence presented and identify possible gaps in the reasoning process. This criterion is especially relevant to research-oriented learning activities, problem-based instruction, and interdisciplinary education.

The evaluative criterion concerns students' ability to assess the accuracy, credibility, relevance, and sufficiency of information. In contemporary digital environments, this dimension is particularly important because students frequently encounter information from websites, social media, artificial intelligence systems, and other sources of varying reliability. The main indicators include evaluating source credibility, identifying unsupported claims, recognizing bias, assessing methodological limitations, and comparing conflicting evidence. For instance, students may compare two articles presenting different conclusions about the effectiveness of online education. They should evaluate the research design, sample characteristics, evidence quality, and limitations of each study before forming a judgment.

An advanced level of evaluative competence involves not only identifying weaknesses but also explaining their implications for the reliability of the conclusions. The argumentative criterion assesses students' ability to construct logical arguments supported by relevant evidence. Argumentation is a fundamental component of critical thinking because it requires students to connect claims, reasons, and evidence coherently.

Its indicators include formulating clear claims, selecting appropriate evidence, explaining the relationship between evidence and conclusions, identifying assumptions, and responding to counterarguments. A practical assessment task may ask students to discuss whether artificial intelligence should be integrated into university examinations.

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Students should formulate a position, provide supporting evidence, consider opposing arguments, and explain the conditions under which their conclusions would remain valid. High-quality argumentation should demonstrate clarity, logical consistency, relevance, and intellectual fairness.

Reflective criterion. The reflective criterion evaluates students' ability to monitor and improve their own reasoning processes. Reflection is essential because critical thinking involves not only evaluating external information but also examining one's assumptions, interpretations, and decisions. Observable indicators include recognizing personal reasoning errors, revising conclusions in response to new evidence, acknowledging uncertainty, and explaining changes in one's viewpoint. Reflective journals, self-assessment reports, peer feedback, and learning portfolios can provide useful evidence of this competence.

For example, after completing a research task, students may be asked to identify which assumptions influenced their initial interpretation and how additional evidence changed their conclusions. Such activities encourage intellectual independence and metacognitive awareness.

Levels of critical thinking competence development. A differentiated assessment system should describe the qualitative characteristics of students' performance at different stages of competence development. The present study proposes four developmental levels: low, basic, proficient, and advanced.

Table 2. Developmental levels of students' critical thinking competence

Level	Description	Observable characteristics
Level 1 — Low	Limited independent reasoning	Difficulty identifying relevant information; reliance on unsupported opinions
Level 2 — Basic	Emerging analytical and evaluative abilities	Identifies basic arguments and evidence but requires guidance
Level 3 — Proficient	Independent and generally consistent reasoning	Evaluates evidence, constructs arguments, and justifies conclusions
Level 4 — Advanced	Systematic, reflective, and sophisticated reasoning	Integrates multiple perspectives, recognizes limitations, and revises judgments

These levels are intended to describe qualitative differences in performance rather than fixed intellectual characteristics of students. Students at the low-level experience difficulties distinguishing facts from opinions, identifying logical relationships, and evaluating the reliability of information. Their conclusions may rely heavily on personal impressions or unverified statements. They typically require substantial instructional support to analyze complex information and construct reasoned arguments.

They can identify main ideas, recognize simple arguments, and distinguish some relevant evidence from irrelevant information. However, their evaluations may remain superficial, and they may have difficulty considering alternative explanations or identifying hidden assumptions. Students

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at the proficient level demonstrate relatively independent analytical and evaluative abilities. They can examine multiple sources, assess the relevance of evidence, formulate coherent arguments, and justify conclusions.

They also recognize some limitations in their reasoning and can revise judgments when presented with convincing evidence. Students at the advanced level demonstrate systematic, flexible, and reflective critical thinking. They can evaluate complex arguments, integrate evidence from different sources, identify methodological limitations, and formulate nuanced conclusions. Their reasoning reflects intellectual independence, openness to alternative perspectives, and awareness of uncertainty.

To support practical implementation, a weighted assessment rubric is proposed. Each criterion is assigned a maximum score according to its relative emphasis within the conceptual model.

Table 3. Proposed scoring rubric for critical thinking competence

Assessment criterion	Maximum score
Cognitive-analytical competence	20
Evaluative competence	25
Argumentative competence	20
Reflective competence	15
Practical decision-making competence	20
Total	100

Research discussion. The proposed framework offers several potential contributions to educational assessment.

First, it provides a structured relationship between abstract critical thinking constructs and observable student performance.

Second, the use of multiple criteria allows educators to identify specific strengths and weaknesses rather than relying exclusively on an overall assessment score.

Third, differentiated performance levels can support individualized feedback and instructional planning.

Fourth, authentic tasks may improve the relevance of assessment by requiring students to apply reasoning skills in meaningful contexts.

Fifth, the integration of reflective activities supports the development of students' metacognitive awareness.

Nevertheless, several methodological limitations should be acknowledged.

Critical thinking is a context-sensitive competence. Students may demonstrate strong reasoning in familiar subject areas but experience difficulties when evaluating unfamiliar or highly specialized information. Assessment results may also be influenced by reading comprehension, language

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proficiency, prior knowledge, and task complexity. Moreover, the use of scoring rubrics does not automatically guarantee assessment reliability. Different evaluators may interpret performance descriptors differently. Therefore, successful implementation requires clear scoring guidelines, evaluator training, moderation procedures, and empirical validation.

Future research should examine the internal structure of the proposed assessment model, inter-rater reliability, criterion validity, and its sensitivity to changes in students' critical thinking performance.

Conclusion. Critical thinking competence represents an essential educational outcome that enables students to analyze information, evaluate evidence, construct logical arguments, reflect on their reasoning, and make informed decisions. The present study developed a theoretical assessment framework consisting of five interconnected criteria: cognitive-analytical, evaluative, argumentative, reflective, and practical decision-making competence. Observable indicators were identified for each criterion, and four developmental levels—low, basic, proficient, and advanced—were proposed to describe differences in student performance.

Ultimately, the systematic assessment of critical thinking should contribute not merely to assigning performance scores but to supporting students' intellectual independence, reflective judgment, and responsible decision-making.

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