проведена диагностическая работа с детьми с особыми потребностями, что позволило собрать информацию об их общем состоянии, истории развития, семейной среде, физическом состоянии и особенностях познавательной деятельности. В результате были составлены кейсы «Алия и ее семья» и «Марат и его семья». На основе бесед и интервью с родителями, а также по методике К.Эттина и Э.Хартмана, для детей были составлены индивидуальные «Эко-карты», которые графически отразили и проанализировали их социальные связи. В статье предложены пути стабилизации эмоционального состояния членов семьи и формирования позитивных взаимоотношений.
Ключевые слова: инклюзивная семья, семейные отношения, ребенок с особыми потребностями, ребенок с ограниченными возможностями, воспитание детей в инклюзивной семье.

Features of relationships in an inclusive family

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Abstract
This article examines the issues of relationships in an inclusive family, the stress factors that arise in families raising a child with special needs, as well as the impact of children with disabilities on their siblings. To study the influence of raising a special child on family members' relationships, their social roles, and overall quality of life, a study was conducted on two families raising children with disabilities. In accordance with the research objectives, a review of scientific articles was conducted, and methods such as observation, conversations, interviews, analysis, and case studies were used. Based on V.Tkacheva's typology of parents raising children with special needs, the types of parents in inclusive families were identified. Using an adapted version of S.D.Zabramnaya's program, a diagnostic study was conducted on children with special needs, which allowed for the collection of information about their general condition, development history, family environment, physical state, and cognitive activity characteristics. As a result, the cases "Aliya and Her Family" and "Marat and His Family" were compiled. Based on conversations and interviews with parents, as well as the methodology of K.Ettin and E.Hartman, individual "Eco-maps" were created for the children, graphically illustrating and analyzing their social connections. The article proposes ways to stabilize the emotional state of family members and foster positive relationships.
Keywords: inclusive family, family relationships, child with special needs, child with disabilities, raising children in an inclusive family.

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MAPPING RESEARCH ON UNIVERSITY STUDENTS' CRITICAL THINKING: A SCOPING REVIEW

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Abstract
Critical thinking is widely recognized as a key psychological and educational construct underlying students' cognitive development, academic success, and readiness to make complex decisions in modern society. In recent years, the increasing digitalization of higher education and the integration of artificial intelligence tools have significantly changed the conditions in which critical thinking is developed, assessed, and demonstrated. This article presents a literature review aimed at mapping current research on critical thinking among university students, focusing on its psychological foundations and interdisciplinary nature. Critical thinking is

conceptualized as an integrative system of cognitive, metacognitive, reflective, and dispositional processes that requires systematic analysis within an interdisciplinary framework, with cognitive science serving as a methodological prototype. Based on an analysis of 27 peer-reviewed studies published in international and regional journals, the review identifies key thematic clusters, including the cognitive and metacognitive components of critical thinking, psychological dispositions and attitudes, linguistic and argumentative processes, assessment approaches, and the impact of digital educational environments. The study's findings highlight prevailing research trends, methodological diversity, and existing gaps, particularly the limited integration of psychological perspectives in digitally mediated contexts. The study highlights the need for interdisciplinary and psychologically informed approaches to understanding and developing critical thinking in higher education.
Keywords: critical thinking, higher education students, cognitive processes, metacognition, interdisciplinary approach, educational psychology, digital educational environment, literature review.

Introduction

Critical thinking has become a central concept in contemporary psychology and higher education research, reflecting the growing need for individuals capable of analytical thinking, reflective judgment, and informed decision-making in the face of complexity, uncertainty, and information overload. In higher education, critical thinking is increasingly viewed not only as a learning outcome but also as a multidimensional psychological phenomenon integrating cognitive processes, metacognitive regulation, dispositional characteristics, and individual value orientations. This shift underscores the relevance of psychological perspectives in understanding how critical thinking develops and functions in the academic context.

The relevance of this study is further reinforced by the rapid digitalization of higher education and the active integration of digital and artificial intelligence-enabled learning environments. These transformations significantly alter the psychological conditions of learning, information processing, and meaning-making, placing new demands on students' cognitive flexibility, self-regulation, evaluative judgment, and reflective awareness. Under these conditions, critical thinking can no longer be adequately studied within isolated disciplinary or purely pedagogical approaches. Instead, it requires a systematic, interdisciplinary analysis that integrates educational psychology, cognitive science, logic, linguistics, and the methodology of scientific knowledge.

From a psychological perspective, critical thinking is typically conceptualized as an integrative system of cognitive and metacognitive processes - such as analysis, synthesis, evaluation, inference, and reflection-supported by relatively stable personality traits, including openness to experience, intellectual responsibility, and a willingness to question assumptions. Contemporary models in cognitive and educational psychology emphasize the role of self-regulation, metacognitive awareness, and argumentation skills as the primary mechanisms underlying higher - order thinking. At the same time, research findings in cognitive science emphasize the close relationship between critical thinking, language, conceptual structures, reasoning models, and the mental representations involved in forming judgments. Despite the significant body of research devoted to critical thinking, the existing literature remains theoretically and methodologically fragmented. Research is scattered across multiple disciplines and often focuses on individual teaching methods, assessment tools, or contextual variables. Relatively less attention has been paid to the psychological foundations of critical thinking development, especially in the context of digital educational environments that increasingly shape contemporary higher education. This fragmentation limits the development of a coherent theoretical framework and hinders the integration of psychological knowledge into educational practice.

This is where the scientific significance of this study lies in its use of a holistic research approach.

The purpose of this study is to systematize and conceptually analyze existing research on critical thinking among university students. Review studies are particularly suitable for complex interdisciplinary phenomena, as they allow for the identification of dominant research trends, conceptual approaches, methodological orientations, and understudied areas. By structuring the

existing research landscape, this study contributes to the theoretical consolidation of critical thinking as a psychological and interdisciplinary construct in higher education.

The purpose of this study is to systematize and analyze contemporary research on critical thinking among university students, focusing on its psychological foundations and interdisciplinary nature. Specifically, the review aims to identify key thematic clusters, conceptual models, and methodological approaches presented in recent studies, as well as to identify gaps related to the integration of psychological perspectives into the educational context mediated by digital technologies. The obtained results are intended to contribute to the development of psychologically grounded and interdisciplinary approaches to critical thinking in higher education.

Main Body

1. Conceptual and Psychological Foundations of Critical Thinking

Contemporary research views critical thinking as a complex psychological construct that extends beyond isolated cognitive skills. Within educational and cognitive psychology, critical thinking is increasingly viewed as an integrative system that integrates cognitive processes, metacognitive regulation, reflective judgment, and dispositional characteristics. This multidimensional understanding reflects a shift from procedural interpretations of critical thinking to models that emphasize internal psychological mechanisms and personal reflection.

From a cognitive perspective, critical thinking involves higher-order mental processes such as analysis, synthesis, evaluation, inference, and abstraction. These processes enable people to critically process information, identifying assumptions, evaluating evidence, constructing arguments, and drawing justified conclusions. However, cognitive processes alone are insufficient to explain individual differences in critical thinking effectiveness. Psychological research consistently demonstrates the importance of metacognitive awareness, including the ability to monitor one's own thought processes, regulate cognitive strategies, and reflect on the validity of judgments.

Dispositional and motivational factors also play a crucial role in the development of critical thinking. Intellectual curiosity, openness to experience, tolerance for ambiguity, and a willingness to question established beliefs are identified as psychological predispositions that support sustained engagement in critical thinking. Without these predispositions, cognitive skills may remain inert and fail to transfer across contexts. Thus, critical thinking emerges as a psychologically grounded construct that integrates skills, awareness, and personal attitudes toward knowledge and reasoning.

2. Interdisciplinary Perspectives on Critical Thinking Research

A review of the existing literature reveals that critical thinking research is inherently interdisciplinary. Psychological research provides insight into cognitive and metacognitive mechanisms, while educational research focuses on learning conditions and the learning environment. Contributions from cognitive science, linguistics, logic, and philosophy further enrich understanding by examining reasoning structures, argumentation patterns, and language-mediated thought processes.

Language plays a particularly important role in critical thinking, as reasoning is often externalized and structured through oral and written language. Research in cognitive linguistics and educational psychology demonstrates how conceptual structuring, narrative structures, and argumentative language influence the formation and evaluation of judgments. Logical models of reasoning provide a formal framework for analyzing the validity of arguments, while philosophical perspectives examine the epistemological aspects of knowledge justification and belief evaluation.

Interdisciplinary approaches allow critical thinking to be viewed as a unified phenomenon rather than a set of disparate skills. However, the studies reviewed show that interdisciplinary integration is often implicit rather than systematically theorized. Many studies draw on concepts from different disciplines without providing a coherent conceptual framework that explains the interaction of cognitive, Psychological and pedagogical components. This fragmentation highlights the need for integrative models that can capture the complexity of developing critical thinking in higher education.

3. Critical Thinking in Digital Learning Environments

The rapid expansion of digital and AI-enabled learning environments has significantly altered the psychological context. Digital platforms are changing the way that students access, process, and evaluate information, increasing cognitive demands related to information overload, source validity, and rapid decision-making. As a result, critical thinking in a digital context requires enhanced metacognitive control and evaluative judgment.

Research shows that digital learning environments can both support and hinder the development of critical thinking. On the one hand, digital tools facilitate access to multiple perspectives, promote collaborative inquiry, and enable the creation of personalized learning paths. Interactive simulations, data visualization tools, and AI-enabled feedback systems can foster analytical thinking and reflective engagement when integrated into pedagogically sound projects. On the other hand, poorly structured digital environments can promote superficial information processing, reliance on automated outputs, and decreased reflection.

From a psychological perspective, the effectiveness of digital tools depends on students' self-regulation abilities and metacognitive strategies. Students who demonstrate higher levels of metacognitive awareness are better prepared to critically evaluate digital content, recognize cognitive biases, and resist algorithmic influence. Therefore, developing critical thinking in digital environments should be based on psychological principles that emphasize self-regulation, reflection, and conscious interaction with information.

4. Mapping Research Trends and Methodological Approaches

A review of the selected studies reveals several dominant research trends. A significant portion of the literature focuses on educational interventions aimed at developing critical thinking through problem-based learning, inquiry-based approaches, and interdisciplinary curricula. Another group of studies examines assessment methods, including standardized tests, performance-based tasks, and discourse analysis methods aimed at measuring critical thinking outcomes. Psychologically oriented studies emphasize the role of metacognition, self-regulated learning, and cognitive dispositions, while fewer studies explicitly integrate these constructs into digital learning research. Methodologically, the reviewed studies employ a wide range of approaches, including experimental designs, quasi-experimental studies, qualitative analyses, and mixed-methods studies. However, the lack of a unified conceptual framework limits the comparability and cumulative impact of the results.

Thematic mapping reveals a significant gap in research that systematically integrates psychological mechanisms, interdisciplinary theory, and digital educational contexts. Although each dimension is examined independently, comprehensive models explaining how these factors interact to develop critical thinking in university students remain underdeveloped.

5. Implications for Theory and Practice

The results of this review study indicate that advancing critical thinking research requires a shift toward psychologically grounded and interdisciplinary concepts. Such concepts must integrate cognitive processes, metacognitive regulation, personality traits, and the context of digital learning into holistic models that reflect the complexity of contemporary higher education.

For educational practice, this implies the need to design learning environments that explicitly promote the development of metacognitive awareness, reflective judgment, and responsible interaction with digital information. Educators should move beyond methods-based approaches and consider students' psychological readiness for critical thinking. To advance theory, future research should focus on developing integrative models capable of explaining critical thinking as a dynamic psychological system operating in interdisciplinary and digital contexts.

Literature review

In contemporary psychological and educational research, critical thinking is widely recognized as a key construct reflecting people's capacity for analytical thinking, reflective judgment, and informed

decision-making in complex educational contexts. Scholars emphasize that critical thinking should not be reduced to a set of isolated cognitive skills, but should be understood as a multidimensional phenomenon integrating cognitive, metacognitive, dispositional, and motivational components [Facione P.A., 2015: P.4].

To advance theory, future research should focus on constructing integrative models that can explain critical thinking as a dynamic psychological system operating in interdisciplinary and digital contexts.

From a psychological perspective, critical thinking is typically viewed as a system of higher-order cognitive processes, including analysis, evaluation, inference, interpretation, and reflection, regulated by metacognitive awareness and self-monitoring mechanisms [Halpern D.F., 2000: P.37]. Research in cognitive psychology shows that these processes enable students to monitor their reasoning, identify inconsistencies, and evaluate the validity of arguments, which is essential for meaningful learning in higher education. [Kuhn D., 1999: P.18].

A significant body of literature emphasizes the importance of dispositional factors in the development of critical thinking. Intellectual dispositions such as openness, cognitive flexibility, intellectual humility, and a willingness to question assumptions are viewed as psychological conditions that support the consistent application of critical thinking skills across diverse contexts [Ennis R.H., 1993: P.181]. Research shows that without these dispositions, cognitive abilities alone are insufficient to ensure reflective and analytical engagement with educational materials [Facione P.A. et al., 1995: P.7].

Interdisciplinary approaches to critical thinking emphasize its close connection with language, logic, and argumentation. Researchers argue that critical thinking is primarily mediated by linguistic structures and reasoning patterns that shape how people construct meaning, evaluate evidence, and justify conclusions [Paul R., Elder L., 2008: P.12]. Research in cognitive science further supports this view, demonstrating that reasoning relies on mental representations, conceptual frameworks, and symbolic systems embedded in language use [Jackendoff R., 2002: P.89].

In recent years, increasing attention has been paid to developing critical thinking in digital educational environments. The digitalization of higher education has transformed the psychological conditions of learning by increasing the availability of information, accelerating knowledge sharing, and introducing tools supported by artificial intelligence [van Laar E. et al., 2020: P.97]. These changes increase the cognitive demands on students, requiring them to develop skills in information evaluation, self-regulation, and reflective judgment [Selwyn N., 2019: P.64].

Several studies suggest that digital learning environments can foster critical thinking when designed to support inquiry-based learning, problem-solving, and metacognitive reflection [Abdrakhmanova G.S., 2021: P.112]. At the same time, researchers caution that unstructured or purely technological integration can lead to superficial information processing and reduced depth of understanding, emphasizing the need for a psychologically informed approach to learning design [Aston K.J., 2023: P.6].

In higher education research, critical thinking is often considered in connection with learning strategies such as problem-based learning, argumentative writing, and inquiry-based tasks. Empirical evidence suggests that such approaches can foster analytical and reflective processes when they explicitly focus on developing reasoning and evaluative skills [Rainbolt G.W., Dwyer S.L., 2015: P.41]. However, scholars note that without considering underlying psychological mechanisms - such as metacognitive control and motivation - these methods may lead to perfunctory rather than meaningful critical reflection [O'Hare L., McGuinness C., 2009: P.128].

Despite the extensive body of research, the critical thinking literature remains conceptually fragmented. Research is typically divided into pedagogical, psychological, and technological aspects, often lacking integrative conceptual frameworks linking cognitive processes to the learning environment and personal characteristics [Sadler G.B., 2010: P.3]. This fragmentation is particularly noticeable in research on digital education, where technological innovation often outpaces theoretical

integration. Given the interdisciplinary nature of critical thinking and its growing relevance in digital higher education, scholars emphasize the importance of synthetic research approaches. Survey research and mapping studies are seen as effective methods for organizing diverse findings, identifying dominant themes, and uncovering understudied psychological aspects of critical thinking development [Repko A.F., 2014: P.27].

Overall, existing research suggests that critical thinking among university students should be viewed as a complex psychological and interdisciplinary phenomenon shaped by cognitive processes, metacognitive regulation, personality traits, and digital learning environments. This understanding underscores the need for a systematic comparison of contemporary research to support theoretical consolidation and the formation of psychologically grounded approaches to the development of critical thinking in higher education.

Materials and Methods

This study utilized a review methodology, which is an appropriate research approach for comparing existing literature, identifying conceptual trends, and identifying research gaps across broad interdisciplinary fields. The choice of this approach is justified by the complex, multifaceted, and psychologically grounded nature of critical thinking as a research construct, particularly in the context of higher education and digital learning environments [Ladenko I.S., 2019].

Review studies are particularly suitable for synthesizing diverse theoretical and empirical research without limiting the analysis to a narrow scope defined the research questions. This methodological flexibility allows for a comprehensive study of critical thinking as an integrative phenomenon encompassing cognitive processes, metacognitive regulation, dispositional factors, and contextual influences [Repko A.F., 2014].

Research Design

The review was conducted in accordance with the general methodological principles of review research commonly applied in psychological and educational research. The research process included the following steps:
- defining the research focus and conceptual boundaries;
- identifying relevant scientific literature;
- selecting studies based on predetermined inclusion and exclusion criteria;
- systematization and classification of data;
- synthesis and thematic mapping of research results [Ladenko I.S., 2019].

The analytical focus of the review was on studies examining critical thinking among university students, with particular attention to its psychological foundations, interdisciplinary interpretations, and development in the context of digital and technologically enhanced education.

Data Sources and Search Strategy

The literature corpus consisted of 27 peer-reviewed articles published in international and national academic journals. The selected studies represented works in the fields of psychology, education, cognitive science, and interdisciplinary higher education research. The search was conducted using academic databases, institutional repositories, and open-access scholarly platforms.

The search strategy included combinations of the following key terms: critical thinking, higher education, university students, psychological aspects, cognitive processes, metacognition, digital learning, technology-enhanced education, interdisciplinary approach, and artificial intelligence in education. Priority was given to publications from the last decade to reflect current theoretical and methodological developments in this field [van Laar E. et al., 2020].

Inclusion and Exclusion Criteria

The inclusion criteria for the review were as follows:
- theoretical or empirical studies focusing on critical thinking in higher education;

- studies examining the psychological, cognitive, or metacognitive aspects of critical thinking;
- studies applying interdisciplinary or integrative conceptual frameworks;
- publications related to digital or technology-supported learning environments.

Exclusion criteria included:
- studies limited exclusively to school education;
- works lacking a clear conceptualization of critical thinking;
- publications that had not undergone academic peer review.

Data Analysis and Comparison Procedure

The selected studies were analyzed using qualitative thematic analysis, which enabled the identification of recurring conceptual patterns and methodological approaches in the literature. Each article was reviewed considering:
- definitions and theoretical models of critical thinking;
- the psychological constructs and cognitive mechanisms involved;
- disciplinary perspectives and methodological orientations;
- contextual factors associated with digital and technology-supported learning environments [Halpern D.F., 2000; Facione P.A., 2015].

Based on this analysis, studies were grouped into thematic categories reflecting dominant research areas and underrepresented areas. This mapping procedure provided a structured overview of how critical thinking is conceptualized and researched in various x disciplines, with a particular emphasis on its psychological foundations in higher education.

Results

An analysis of the 27 selected studies reveals that contemporary research on critical thinking among university students is characterized by conceptual diversity, methodological pluralism, and a pronounced interdisciplinary orientation. Thematic mapping of the literature revealed five main research clusters reflecting the dominant directions in the study of critical thinking in higher education.

1. Psychological and Cognitive Foundations of Critical Thinking

A significant group of studies conceptualizes critical thinking primarily as a psychological and cognitive phenomenon, focusing on the internal mental processes and individual characteristics of students. These studies emphasize cognitive operations such as analysis, synthesis, evaluation, inference, and reflection, highlighting the central role of metacognition, self-regulation, and cognitive flexibility in the development of critical thinking [Halpern D.F., 2000: P.41].

Within this group, critical thinking is often viewed in relation to higher-order cognitive processes and metacognitive awareness, which enable students to monitor, regulate, and evaluate their own thinking strategies [Facione P.A., 2015: p. 6]. Several studies also highlight the importance of dispositional factors, including openness, intellectual curiosity, and cognitive autonomy, as psychological prerequisites for sustained engagement in critical thinking [Ennis R.H., 1993: P.182].

The results indicate that students' psychological readiness and individual cognitive characteristics significantly influence their ability to think critically. These studies support the view that critical thinking should be understood not simply as a set of skills, but as an integrated cognitive-personal system that develops over time [Temirbaeva D., 2019: P.80].

2. Critical Thinking as an Educational and Pedagogical Construct

Another significant body of research examines critical thinking from an educational and pedagogical perspective, focusing on teaching strategies, learning models, and curriculum development in higher education. Research in this area examines how specific teaching approaches can stimulate students' analytical and reflective thinking [Khamkhoeva L.M., 2024].

The studies reviewed emphasize the importance of problem-based and inquiry-based learning,

constructivist and student-centered pedagogy, dialogic learning, and inquiry-based tasks as effective means of developing critical thinking [Abayeva N. et al., 2023: P.243]. Psychological mechanisms such as motivation to learn, cognitive engagement, and reflective activity are often identified as mediating factors determining the effectiveness of pedagogical interventions [O'Hare L., McGuinness C., 2009: P.127].

The results show that the development of critical thinking is closely linked to an educational environment that encourages questioning, argumentation, and independent knowledge construction, as well as supports students' psychological engagement in the learning process [Temirbaeva D., 2019: P.82].

3. Interdisciplinary Approaches to the Development of Critical Thinking

More and more studies employ an interdisciplinary approach, viewing critical thinking as a cross-cutting competency formed at the intersection of psychology, pedagogy, cognitive science, linguistics, and the philosophy and methodology of science. These studies emphasize that critical thinking cannot be fully understood within a single disciplinary framework [Repko I.S., 2014: P.29].

In this area, particular attention is paid to the relationship between critical thinking and language, discourse and argumentation, as well as the logical and epistemological foundations of reasoning [Paul R., Elder L., 2008: P.14]. Several studies emphasize the integration of scientific methodology and research skills into higher education as a means of developing students' analytical and evaluative abilities [Rainbolt G.W.; Dwyer S.L., 2015: P.39].

The results demonstrate that interdisciplinary frameworks allow researchers to view critical thinking as a metacognitive and epistemological phenomenon integrating the cognitive, affective, and value aspects of human thought [Temirbaeva D., 2019: P.85].

4. Critical Thinking in Digital and Technologically Enhanced Learning Environments

A separate thematic cluster is devoted to the development of critical thinking in digital and technologically enhanced learning environments, including online learning platforms, intelligent educational systems, and AI-enabled tools. These studies examine how digitalization is changing the psychological conditions of learning and thinking [van Laar E. et al., 2020: P.98].

The results demonstrate that the integration of digital technologies into art education significantly enhances students’ critical thinking, creativity, and readiness for contemporary artistic practice [Togabayeva G.Sh. et al., 2025]. Technologically supported learning environments promote student autonomy, independent learning, and information evaluation skills, which are closely linked to the development of critical thinking [Selwyn N., 2019: P.67]. At the same time, a number of studies identify potential risks, including superficial information processing and cognitive overload, emphasizing the need for psychological and pedagogical mediation in digital contexts [Aston K.J., 2023: P.7].

5. Assessing and Measuring Critical Thinking

The final section addresses issues related to the assessment and measurement of critical thinking, with an emphasis on methodological and psychometric challenges. Research in this area examines standardized tests, task-based assessments, and assessments of argumentation and writing [Fazione P.A. et al., 1995: P.12].

The studies reviewed reveal persistent difficulties in capturing the multidimensional nature of critical thinking, particularly its psychological and metacognitive components [O'Hare L., McGuinness C., 2009: P.130]. Several authors emphasize the need for assessment models that are consistent with contemporary theoretical conceptions of critical thinking and reflect both cognitive processes and personality traits [Temirbaeva D., 2019: P.88].

Summary of Thematic Mapping

Overall, thematic mapping demonstrates that contemporary research increasingly views critical

thinking as a complex, interdisciplinary, and psychologically grounded construct. Although significant progress has been made in understanding this concept, its cognitive and pedagogical aspects, a synthesis of psychological, digital, and interdisciplinary perspectives, remain an underdeveloped area, indicating the need for further theoretical integration and conceptual clarification.

Discussion

The results of the review study confirm that critical thinking in higher education is increasingly conceptualized as a multidimensional and psychologically grounded construct, rather than as a set of isolated cognitive skills. Thematic mapping reveals a clear shift in contemporary research toward integrative models that integrate the cognitive, metacognitive, personal, and contextual dimensions of thinking, reflecting the growing complexity of educational and psychological realities in digital learning environments [Lorenz A., 2021: P.1135].

Interdisciplinary Interpretation of Critical Thinking

One of the most significant findings of the review is the dominance of interdisciplinary interpretations of critical thinking in the analyzed studies. Psychological research primarily emphasizes internal cognitive mechanisms such as reasoning, reflection, self-regulation, and metacognitive monitoring, while pedagogical research focuses on instructional design, teaching strategies, and educational environments that foster higher-order thinking [Maksutova I.O., 2019: P.125].

At the same time, contributions from cognitive science, logic, philosophy, and the methodology of science provide epistemological and methodological perspectives, particularly with regard to argumentation, knowledge justification, and scientific reasoning. This convergence fosters an understanding of critical thinking as a metacognitive and metaepistemic phenomenon integrating logical operations, language-mediated reasoning, and personal meaning-making processes [Lorenz A., 2021: P.1137].

The results demonstrate that interdisciplinary platforms—such as those developed within the cognitive sciences - provide a productive methodological space for conceptualizing and developing critical thinking in higher education. Such platforms allow researchers to overcome the fragmentation of disciplines and consider critical thinking as a complex psychological and educational phenomenon.

Psychological Aspects and Personality Traits

Another important finding of the review is the consistent emphasis on the psychological factors influencing the development of critical thinking. Many studies emphasize the role of metacognition, motivation, emotional regulation, and intellectual qualities in developing students' ability to critically analyze information and knowledge [Maksutova I.O., 2019: P.127].

The reviewed literature indicates that the development of critical thinking is closely linked to students' internal readiness for reflective and analytical activity. This supports the view that critical thinking cannot be effectively developed solely through teaching methods, but requires the ongoing development of self-awareness, cognitive autonomy, and reflective skills [Lorenz A., 2021: P.1140].

From this perspective, critical thinking predetermines Critical thinking emerges as a form of personal cognitive culture, developed through sustained engagement with complex problems, reflective practice, and meaning-oriented learning, rather than through short-term or fragmented educational interventions.

Digital Educational Environments as Catalyst and Challenge

A discussion of digital and technologically enhanced learning environments reveals their dual role in the development of critical thinking. On the one hand, digital platforms, online learning environments, and AI-enabled tools create new opportunities for exploration, analysis, and autonomous learning, expanding students' access to a variety of information sources and modes of interaction [Lorenz A., 2021: P.1142].

On the other hand, a number of studies point to the risks associated with digital learning, including superficial information processing, cognitive overload, and decreased depth of reflection. These findings highlight the need for psychologically informed pedagogical mediation in digital contexts, ensuring that technology functions as a cognitive tool rather than as a mechanism for passive content consumption [Maksutova I.O., 2019: P.129].

The review demonstrates that developing critical thinking in a digital environment requires targeted instructional design, reflective support, and methodological guidance that promote deep cognitive processing and evaluative thinking.

Implications for Higher Education Practice

The synthesis of the reviewed studies allows us to formulate a number of implications for higher education practice. Effective development of critical thinking in university students depends on:
- interdisciplinary integration of psychological, pedagogical, and cognitive perspectives;
- creating learning environments that promote reflection, argumentation, and metacognitive awareness;
- purposeful use of digital technologies as tools for cognitive engagement rather than for the transmission of information;
- assessment approaches that consider both cognitive abilities and personality characteristics [Lorenz A., 2021: P.1145].

Overall, the discussion highlights the need to move from fragmented teaching methods to systemic and integrative models of critical thinking development that reflect its psychological complexity and interdisciplinary nature in contemporary higher education.

Conclusion

This literature review presents a systematic and conceptually structured overview of current research on critical thinking among university students, with a particular emphasis on its psychological foundations, interdisciplinary nature, and development in the context of digital education. The analysis confirms that critical thinking is no longer viewed simply as a set of transferable cognitive skills, but rather as a complex and integrative system of cognitive, metacognitive, reflective, and personal processes.

Thematic mapping of the reviewed studies demonstrates a clear convergence with an interdisciplinary framework that places critical thinking at the intersection of psychology, pedagogy, cognitive science, and digital education. Psychological perspectives emphasize the crucial role of metacognition, self-regulation, motivation, and intellectual attitudes in shaping students' critical thinking abilities. At the same time, pedagogical and interdisciplinary approaches emphasize the importance of learning environments that support inquiry, argumentation, reflective reasoning, and the construction of meaningful knowledge.

The study's findings also demonstrate that digital educational environments and technologies supported by artificial intelligence are significantly transforming the conditions in which critical thinking develops. Digital tools grounded in psychological principles and pedagogical focus can enhance depth of analysis, facilitate reflective activity, and support learner autonomy and personalized learning trajectories. However, the review also identifies potential risks associated with learning using digital technologies, including fragmented cognition, shallow information processing, and decreased depth of reflection, highlighting the need for methodologically and psychologically informed learning design.

Overall, the review's findings highlight the need for a systemic and interdisciplinary approach to developing critical thinking in higher education. This approach allows for the coherent integration of psychological mechanisms, pedagogical strategies, and digital technologies into a unified conceptual framework that promotes students' cognitive maturity, epistemological awareness, and professional readiness. Future research should focus on refining interdisciplinary models of critical thinking, exploring psychologically informed digital and AI-enabled interventions, and developing assessment

tools that can to reflect the multidimensional and dynamic nature of critical thinking in the modern context of higher education.

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Жоғары оқу орындары студенттерінің сыни ойлауын зерттеулерді карталау: шолу зерттеу

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Аңдатпа

Сыни ойлау студенттердің когнитивтік дамуының, академиялық табыстылығының және қазіргі қоғамдағы күрделі шешімдер қабылдауға дайын болуының негізін құрайтын маңызды психологиялық-педагогикалық конструкт ретінде кеңінен танылады. Соңғы жылдары жоғары білім берудің қарқынды цифрландырылуы және жасанды интеллект құралдарының енгізілуі сыни ойлаудың қалыптасу, бағалану және көрініс табу жағдайларын елеулі түрде өзгертті. Бұл мақала жоғары оқу орындары студенттерінің сыни ойлауын зерттеуге арналған қазіргі ғылыми еңбектерді жүйелеуге бағытталған әдеби шолу болып табылады және оның психологиялық негіздері мен пәнаралық сипатына ерекше назар аударады. Сыни ойлау когнитивтік ғылымдар әдіснамалық прототип ретінде алынатын пәнаралық шеңберде жүйелі талдауды талап ететін когнитивтік, метакогнитивтік, рефлексивтік және диспозициялық үдерістердің интегративті жүйесі ретінде қарастырылады. Халықаралық және аймақтық ғылыми журналдарда жарияланған 27 рецензияланатын зерттеуді талдау негізінде сыни ойлаудың когнитивтік және метакогнитивтік компоненттері, психологиялық диспозициялар мен көзқарастар, тілдік және аргументациялық үдерістер, бағалау тәсілдері, сондай-ақ цифрлық білім беру

ортасының ықпалы сияқты негізгі тақырыптық кластерлер айқындалды. Зерттеу нәтижелері басым ғылыми бағыттарды, әдіснамалық алуандықты және әсіресе цифрлық делдалданған контекстерде психологиялық көзқарастардың жеткіліксіз интеграциялануы сияқты өзекті олқылықтарды көрсетеді. Зерттеу жоғары білім беру жүйесінде сыни ойлауды түсіну мен дамытудың пәнаралық және психологиялық тұрғыдан негізделген тәсілдерінің қажеттілігін айқындайды.
Түйін сөздер: сыни ойлау, жоғары білім студенттері, когнитивтік үдерістер, метакогниция, пәнаралық тәсіл, білім беру психологиясы, цифрлық білім беру ортасы, әдеби шолу.

Картирование исследований критического мышления студентов высших учебных заведений: обзор с определением границ

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Аннотация
Критическое мышление широко признаётся ключевым психолого-педагогическим конструктом, лежащим в основе когнитивного развития студентов, их академической успешности и готовности к принятию сложных решений в условиях современного общества. В последние годы активная цифровизация высшего образования и интеграция инструментов искусственного интеллекта существенно изменили условия формирования, оценки и проявления критического мышления. В данной статье представлен обзор литературы, направленный на картирование современных исследований критического мышления студентов высших учебных заведений с акцентом на его психологические основания и междисциплинарный характер. Критическое мышление рассматривается как интегративная система когнитивных, метакогнитивных, рефлексивных и диспозиционных процессов, требующая системного анализа в рамках междисциплинарного подхода, в котором когнитивные науки выступают в качестве методологического прототипа. На основе анализа 27 рецензируемых исследований, опубликованных в международных и региональных научных журналах, выявлены ключевые тематические кластеры, включающие когнитивные и метакогнитивные компоненты критического мышления, психологические диспозиции и установки, языковые и аргументационные процессы, подходы к оценке, а также влияние цифровой образовательной среды. Полученные результаты отражают доминирующие исследовательские тенденции, методологическое разнообразие и существующие пробелы, в частности недостаточную интеграцию психологических подходов в условиях цифрового опосредованного обучения. Делается вывод о необходимости междисциплинарных и психологически обоснованных подходов к пониманию и развитию критического мышления в системе высшего образования.
Ключевые слова: критическое мышление, студенты высших учебных заведений, когнитивные процессы, метакогниция, междисциплинарный подход, педагогическая психология, цифровая образовательная среда, обзор литературы.

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