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MUNDARIJA CONTENTS СОДЕРЖАНИЕ

MUNDARIJA

THE STRUCTURAL COMPOSITION AND DEVELOPMENTAL STAGES OF CRITICAL THINKING SKILLS

UDK 37.025.7:373.1

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Abstract: Critical thinking represents one of the most extensively studied yet persistently misunderstood constructs in educational psychology and pedagogy. Despite decades of theoretical elaboration and empirical investigation, teacher education programs continue to treat critical thinking as either a generic transferable skill or a vaguely defined graduate attribute, without adequate attention to its internal structural complexity or the specific developmental trajectory through which it is acquired. This article addresses both dimensions: first, by proposing a multi-layered structural model of critical thinking that distinguishes its cognitive, metacognitive, dispositional, and epistemic components; and second, by synthesizing existing developmental frameworks into a coherent stage model that maps the progression from novice to expert critical thinking across the educational lifespan. The article draws on cognitive psychology, philosophy of education, and language teacher education research to argue that effective critical thinking pedagogy requires precise structural knowledge of what is being developed and a longitudinally informed understanding of how that development unfolds. Implications for curriculum design, formative assessment, and teacher educator practice are discussed.

Key words: critical thinking structure, developmental stages, metacognition, epistemic cognition, dispositions, cognitive skills, teacher education, higher-order thinking.

Annotatsiya: Tanqidiy fikrlash ta'lim psixologiyasi va pedagogika sohasida eng ko'p o'rganilgan, biroq hanuzgacha yetarlicha aniq talqin qilinmagan murakkab tushunchalardan biridir. Nazariy izohlar va empirik tadqiqotlarning ko'p yillik rivojlanishiga qaramay, o'qituvchilarni tayyorlash dasturlarida tanqidiy fikrlash ko'pincha umumiy ko'chiriluvchi ko'nikma yoki bitiruvchilarning noaniq tavsiflangan sifati sifatida talqin qilinadi, uning ichki strukturaviy murakkabligi hamda egallanishining aniq rivojlanish trayektoriyasiga yetarli e'tibor qaratilmaydi. Mazkur maqola ushbu ikki jihatni qamrab oladi: birinchidan, tanqidiy fikrlashning kognitiv, metakognitiv, dispozitsion va epistemik tarkibiy qismlarini ajratib ko'rsatuvchi ko'p qatlamli strukturaviy model taklif etiladi; ikkinchidan, mavjud rivojlanish nazariyalari sintez qilinib, ta'lim jarayonining barcha bosqichlarida boshlang'ich darajadan ekspert darajasigacha bo'lgan o'sishni aks ettiruvchi izchil bosqichli model ishlab chiqiladi. Maqola kognitiv psixologiya, ta'lim falsafasi va chet tillarni o'qitish metodikasi bo'yicha tadqiqotlarga tayangan holda, tanqidiy fikrlashni samarali rivojlantirish uchun uning tarkibiy elementlari hamda rivojlanish dinamikasini chuqur anglash zarurligini asoslaydi. Shuningdek, o'quv dasturini loyihalash, formatif baholash va pedagoglarni tayyorlash amaliyoti uchun metodik xulosalar yoritiladi.

Kalit so'zlar: tanqidiy fikrlash tuzilmasi, rivojlanish bosqichlari, metakognitsiya, epistemik kognitsiya, dispozitsiyalar, kognitiv ko'nikmalar, o'qituvchi ta'limi, yuqori darajali tafakkur.

Аннотация: Критическое мышление является одним из наиболее изучаемых, но вместе с тем по-прежнему недостаточно точно интерпретируемых понятий в образовательной психологии и педагогике. Несмотря на десятилетия теоретических разработок и эмпирических исследований, программы подготовки учителей по-прежнему рассматривают критическое мышление либо как универсальный переносимый навык, либо как расплывчато определённое качество выпускника, не уделяя должного внимания его внутренней структурной сложности и конкретной траектории развития в процессе освоения. Настоящая статья рассматривает оба этих аспекта: во-первых, предлагается многослойная структурная модель критического мышления, выделяющая его когнитивные, метакогнитивные, диспозиционные и эпистемические компоненты; во-вторых, существующие модели развития синтезируются в целостную стадийную модель, отражающую переход от начального уровня к экспертному критическому мышлению на протяжении всей образовательной траектории. Опираясь на исследования в области когнитивной психологии, философии образования и методики подготовки учителей иностранных языков, автор обосновывает, что эффективное формирование критического мышления требует точного понимания его структуры и развития во времени. Также обсуждаются практические выводы для проектирования учебных программ, формативного оценивания и подготовки педагогов.

Ключевые слова: структура критического мышления, стадии развития, метакогниция, эпистемическое познание, диспозиции, когнитивные навыки, педагогическое образование, мышление высокого уровня.

INTRODUCTION

Few constructs in education have attracted as much rhetorical endorsement and as little structural precision as critical thinking. From national curriculum frameworks to university mission statements, from employer surveys to international educational assessments, critical thinking appears on virtually every list of desired graduate outcomes. Yet when educators are asked to specify what they mean by the term–what cognitive operations it involves, how it differs from related constructs such as analytical reasoning or creative thinking, and through what developmental sequence it is acquired–the answers are typically vague, inconsistent, or mutually contradictory.

This definitional imprecision has serious practical consequences. Teachers who do not have a clear structural model of critical thinking cannot design instruction that deliberately targets its component elements. Assessment designers who conflate critical thinking with general intelligence or academic achievement cannot create instruments sensitive enough to detect and measure its specific developmental progression. Teacher educators who lack a stage model of critical thinking development cannot calibrate their pedagogical expectations to the actual cognitive capacities of their students at different points in their professional formation.

The argument of this article is that these practical problems are fundamentally problems of theoretical inadequacy and that resolving them requires sustained engagement with the best available theoretical and empirical accounts of critical thinking's structure and development. The first part of the article constructs a multi-component structural model by synthesizing contributions from philosophy, cognitive psychology, and educational research. The second part synthesizes existing developmental frameworks–including Perry's (1970) scheme of intellectual development, King and Kitchener's (1994) reflective judgment model, and Kuhn's (1999) argumentative reasoning research–into a coherent stage account. The third part draws practical implications for education.

LITERATURE REVIEW

The scholarly literature on critical thinking has evolved across three major traditions: philosophical, cognitive-psychological, and developmental-educational perspectives. Each tradition contributes a distinct understanding of what critical thinking is, how it functions, and how it develops over time.

The philosophical tradition primarily conceptualizes critical thinking as rational judgment governed by standards of logic, evidence, and intellectual criteria. One of the most influential accounts is provided by Ennis (1985, 2011), who defines critical thinking as "reasonable, reflective thinking focused on deciding what to believe or do." This definition foregrounds judgment, reflective suspension, and reasoned decision-making as the core of critical thought. Similarly, Paul and Elder (2008) emphasize the role of intellectual standards such as clarity, precision, relevance, depth, and fairness, arguing that critical thinking requires disciplined, self-directed reasoning guided by universal criteria.

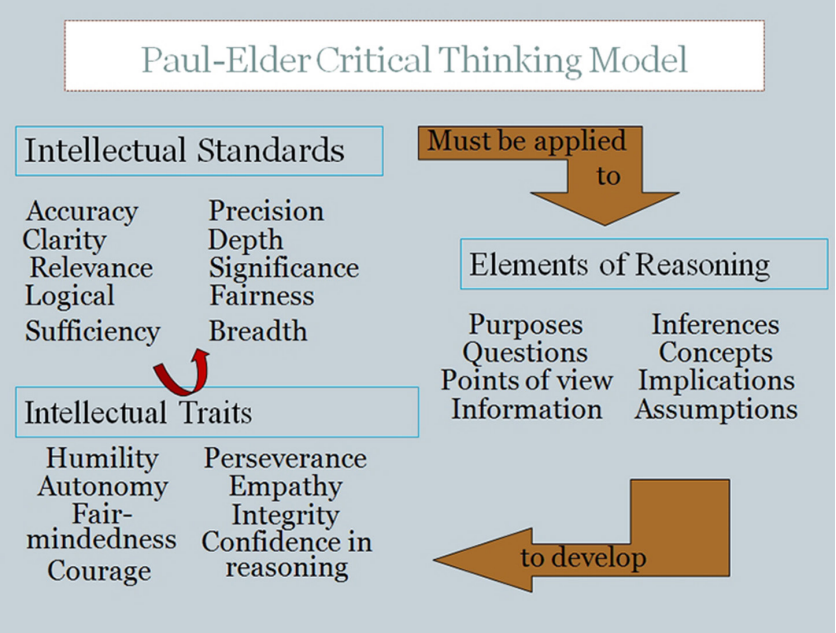
From the cognitive-psychological perspective, scholars have focused on the internal mental processes that enable critical thinking performance. The Delphi Report, led by Facione (1990), remains the most widely accepted consensus framework, identifying interpretation, analysis, evaluation, inference, explanation, and self-regulation as the six core cognitive skills. Later studies expanded this framework by integrating metacognitive monitoring and regulation into critical thinking models. Flavell (1979) established metacognition as a distinct psychological domain, while subsequent research demonstrated its strong predictive role in reasoning quality and academic success (Veenman et al., 2006). This line of work suggests that critical thinking is not reducible to isolated reasoning skills but depends on higher-order executive control over cognition.

A third major strand concerns the developmental trajectory of critical thinking, particularly the epistemic shifts that enable more advanced reasoning. The seminal work of Perry (1970) introduced a longitudinal scheme of intellectual and ethical development in higher education, tracing the movement from dualistic certainty toward contextual relativism and informed commitment. Building on this, King and Kitchener (1994) developed the Reflective Judgment Model, which demonstrated that sophisticated critical reasoning emerges only when learners recognize uncertainty as an inherent feature of knowledge and learn to justify claims through evidence-based inquiry. Complementing this developmental account, Kuhn (1999, 2019) showed that argumentative reasoning evolves from rhetorical persuasion toward epistemic dialogue aimed at truth-seeking.

Recent literature has increasingly emphasized the dispositional and epistemic dimensions of critical thinking. Facione, Facione, and Giancarlo (2000) argue that truth-seeking, open-mindedness, systematicity, and cognitive maturity are essential dispositional foundations, without which critical thinking competence may remain inert. Likewise, research on epistemic cognition by Hofer and Pintrich (1997) demonstrates that beliefs about certainty, simplicity, source, and justification of knowledge fundamentally shape how learners engage with evidence and disagreement.

RESEARCH METHODOLOGY

Despite these advances, a significant gap remains in the literature: most existing models examine either the structure of critical thinking or its developmental progression, but rarely integrate both into a single coherent framework. The present article addresses this gap by synthesizing structural and developmental perspectives into a unified model applicable to teacher education and higher-order learning design.



Picture 1: **Paul Elder' model for critical thinking.**

A recurring limitation in popular accounts of critical thinking is the conflation of what are, in fact, distinct psychological components operating at different levels of cognitive processing. A structurally adequate account must distinguish, at a minimum, four levels: cognitive skills, metacognitive processes, epistemic beliefs, and intellectual dispositions. Each level is analytically distinct, yet all four interact dynamically in the actual exercise of critical thinking.

ANALYSIS AND RESULTS

The most widely cited structural account of critical thinking at the cognitive level remains Facione's (1990) consensus-based taxonomy, which identifies six core cognitive skills: interpretation, analysis, evaluation, inference, explanation, and self-regulation. These skills are not a simple linear sequence but a set of interrelated operations that skilled critical thinkers deploy flexibly and recursively in response to the demands of particular reasoning tasks.

Interpretation involves comprehending and expressing the meaning of a wide variety of experiences, situations, data, events, judgments, conventions, beliefs, rules, procedures, or criteria. In educational contexts, interpretation failure–the inability to accurately grasp what a text, argument, or data set is actually claiming–is among the most common and consequential cognitive shortcomings. Students who misinterpret the conclusion of an argument cannot evaluate it; teachers who misread student errors cannot respond to them productively.

Analysis involves identifying the inferential relationships among statements, questions, concepts, descriptions, or other forms of representation intended to express belief, judgment, experiences, reasons, information, or opinions. Analysis requires the ability to decompose complex wholes into their constituent parts and to trace the logical relationships among those parts–to identify which claims are offered as premises for which conclusions and to recognize the structure of an argument before evaluating its validity.

Evaluation involves assessing the credibility of statements or other representations that are accounts or descriptions of a person's perception, experience, situation, judgment, belief, or opinion, as well as assessing the logical strength of the actual or intended inferential relationships among statements, descriptions, questions, or other forms of representation. Evaluation is the operation most people have in mind when they think of critical thinking–the capacity to distinguish strong from weak arguments, reliable from unreliable evidence, and valid from invalid inferences.

Inference involves identifying and securing elements needed to draw reasonable conclusions, to form conjectures and hypotheses, to consider relevant information, and to deduce the consequences flowing from data, statements, principles, evidence, judgments, beliefs, opinions, concepts, descriptions, questions, or other forms of representation. Inference moves beyond the analysis of existing arguments to the construction of new ones–it is the generative dimension of critical thinking.

Explanation involves stating the results of one's reasoning, justifying that reasoning in terms of the evidential, conceptual, methodological, criteriological, and contextual considerations upon which those results were based, and presenting one's reasoning in the form of cogent arguments. The ability to explain one's reasoning is both a communicative and a cognitive competency: the process of constructing an explanation often reveals gaps or weaknesses in the underlying reasoning that were previously invisible.

Self-regulation involves self-consciously monitoring one's own cognitive activities, the elements used in those activities, and the results produced, particularly by applying skills of analysis and evaluation to one's own inferential judgments with a view to questioning, confirming, validating, or correcting either one's reasoning or one's results. Self-regulation is the critical thinking skill most closely related to metacognition, and its development is perhaps the most powerful predictor of long-term intellectual growth.

Metacognition–thinking about one's own thinking–operates at a level above the individual cognitive skills described above and is essential for their coordinated deployment. Flavell (1979), who introduced the term into educational psychology, distinguished between metacognitive knowledge (what one knows about cognition in general and one's own cognition in particular) and metacognitive regulation (the executive processes through which one monitors and controls ongoing cognitive activity).

In the context of critical thinking, metacognitive knowledge includes awareness of one's own reasoning tendencies and biases, understanding of the conditions under which different reasoning strategies are appropriate, and knowledge of the standards by which good reasoning is distinguished from poor reasoning. Metacognitive regulation includes planning (selecting appropriate reasoning strategies before engaging with a complex problem), monitoring (checking the adequacy of one's reasoning as it proceeds), and evaluating (assessing the quality of one's reasoning after it is complete).

Research consistently demonstrates that metacognitive competence is a stronger predictor of academic achievement and reasoning quality than domain-specific knowledge alone (Veenman, Van Hout-Wolbers, & Afflerbach, 2006). More importantly for educational purposes, metacognitive skills are teachable: explicit instruction in metacognitive strategies–think-alouds, self-questioning protocols, reasoning journals–produces measurable improvements in reasoning quality across a range of academic domains.

A dimension of critical thinking that has received growing attention in recent decades is what researchers call epistemic cognition: individuals' beliefs about the nature of knowledge and knowing. How a person understands what knowledge is, how it is justified, and how certain it can be has profound implications for how they engage with evidence, evaluate expert claims, and respond to intellectual disagreement.

Hofer and Pintrich (1997) identify four dimensions of epistemic beliefs particularly relevant to critical thinking: beliefs about the certainty of knowledge (ranging from the view that knowledge is fixed and absolute to the recognition that it is tentative and evolving), beliefs about the simplicity of knowledge (ranging from the view that knowledge consists of isolated facts to the recognition that it is complex and interconnected), beliefs about the source of knowledge (ranging from unquestioning deference to authority to the recognition that knowledge must be personally evaluated), and beliefs about the justification of knowing (ranging from reliance on personal experience and authority to the use of systematic evidence and reasoning).

Individuals with naive epistemic beliefs–those who view knowledge as certain, simple, externally authoritative, and self-evidently justified–are structurally limited in their capacity for critical thinking regardless of their cognitive skill level. They may be able to perform individual cognitive operations (analyzing an argument, identifying a logical fallacy), but they lack the epistemic orientation that motivates sustained critical inquiry–the recognition that knowledge claims are always provisional, that multiple perspectives may have partial validity, and that intellectual effort is required to construct well-justified positions. Developing more sophisticated epistemic beliefs is therefore not merely an incidental aspect of critical thinking education but a prerequisite for its higher-level manifestations.

The cognitive skills, metacognitive processes, and epistemic beliefs described above constitute the competence dimension of critical thinking–what a person is capable of doing. However, critical thinking also has a performance dimension: the actual deployment of these capacities habitually and appropriately, even when it is cognitively effortful, socially uncomfortable, or personally challenging. This performance dimension is captured by the concept of intellectual dispositions.

Facione, Facione, and Giancarlo (2000) identify seven core critical thinking dispositions: truth-seeking (the motivation to follow evidence even when it leads to uncomfortable conclusions), open-mindedness (the willingness to consider perspectives other than one's own), analyticity (the disposition to approach problems with

careful, evidence-based reasoning), systematicity (the preference for organized, focused, and diligent inquiry), confidence in reasoning (trust in the processes of inquiry and in one's own reasoning capacities), inquisitiveness (intellectual curiosity and the desire to know), and cognitive maturity (the recognition that judgments must be made despite uncertainty and that multiple perspectives can be valid).

These dispositions are not merely personality traits but educable habits of mind–patterns of intellectual engagement that can be deliberately cultivated through sustained participation in communities of inquiry where they are modeled, expected, and rewarded. Their development requires more than exposure to reasoning instruction; it requires immersion in intellectual cultures that value and practice the dispositions themselves.

Understanding the structure of critical thinking is necessary but insufficient for educational purposes. Effective pedagogy also requires a longitudinal perspective: knowledge of how critical thinking develops across the educational lifespan, what cognitive and epistemic transformations characterize progression from one developmental level to the next, and what kinds of educational experiences support or inhibit that progression. Several theoretical frameworks provide the empirical and conceptual foundations for such a stage model. William Perry's (1970) landmark longitudinal study of Harvard undergraduates produced the first systematic account of how college students' epistemic beliefs evolve in response to educational experience. Perry identified nine "positions" through which students move, grouped into four broad phases: Dualism, Multiplicity, Relativism, and Commitment within Relativism.

In the Dualist phase, students perceive the world in binary terms: knowledge is either right or wrong, authorities either know or do not know, tasks either have correct answers or do not. At this stage, critical thinking in any meaningful sense is not yet possible because the student's epistemic framework does not accommodate the provisional, evidence-dependent character of genuine knowledge claims. The student's orientation toward learning is acquisitive: the task is to receive correct knowledge from authoritative sources, not to evaluate competing claims. In the Multiplicity phase, students encounter genuine intellectual disagreement and respond by concluding that all opinions are equally valid–that where authorities disagree, there is no basis for preferring one position to another. This represents an epistemic advance over Dualism (uncertainty is now acknowledged) but simultaneously a regression in analytical engagement (evaluation of competing claims is abandoned as pointless). Many students remain in some version of this position for extended periods, which has important implications for pedagogy: treating all student opinions as equally valid–a common misapplication of learner-centered approaches–can inadvertently reinforce Multiplistic thinking by failing to model or require evidence-based evaluation.

In the Relativist phase, students recognize that knowledge claims are context-dependent and must be evaluated against criteria of evidence, reasoning, and contextual appropriateness. This is the phase in which genuine critical thinking first becomes possible: students can now analyze arguments, evaluate evidence, and construct reasoned positions rather than simply receiving or cataloguing opinions. However, relativism without commitment can produce a form of analytical paralysis–the recognition that every position has counterarguments can lead to an inability or unwillingness to commit to any position.

Perry's final phase, Commitment within Relativism, represents epistemically mature critical thinking: the ability to make well-reasoned, personally committed judgments while simultaneously acknowledging their provisional and fallible character and remaining open to revision in the light of new evidence or better arguments. This is the intellectual disposition of the reflective professional described in Schön's (1983) work–capable of decisive action based on reasoned judgment, yet maintaining the intellectual humility to recognize the limits of that reasoning.

King and Kitchener's Reflective Judgment Model. King and Kitchener's (1994) Reflective Judgment Model, developed through extensive longitudinal research with participants ranging from high school students to doctoral graduates, provides a more fine-grained developmental account organized around seven stages grouped into three levels.

Pre-reflective thinking (Stages 1–3) is characterized by the belief that knowledge is certain and directly accessible–either through personal observation or through the pronouncements of authoritative sources. Individuals at this level do not recognize the existence of genuine epistemic uncertainty; they experience disagreement as an anomaly to be resolved by identifying the correct authority rather than as a signal for evidence-based inquiry. Critical thinking, in the sense discussed in this article, is not yet operative at this level.

Quasi-reflective thinking (Stages 4–5) is characterized by the recognition of genuine uncertainty but the absence of adequate strategies for managing it. Individuals at this level acknowledge that knowledge claims are interpretations rather than direct reports of reality and that different interpretations may be equally plausible. However, they lack the epistemic tools to evaluate competing interpretations systematically, and they tend to treat evidence as a matter of personal perspective rather than as a basis for reasoned judgment. This is the developmental level at which many undergraduate students, and unfortunately some teachers, remain.

Reflective thinking (Stages 6–7) is characterized by the integration of uncertainty with systematic, evidence-based reasoning. Individuals at this level understand that, while knowledge is always constructed and fallible, some knowledge claims are better justified than others and that the quality of justification can be evaluated against explicit epistemic criteria. They actively seek evidence, consider multiple perspectives, construct well-reasoned positions, and remain open to revision. Crucially, they understand that the goal of inquiry is not to eliminate uncertainty–which is impossible–but to manage it through rigorous, honest reasoning.

King and Kitchener's research demonstrates that progression through these stages is neither automatic nor rapid: the average college graduate in their studies was at Stage 3–4, considerably below the reflective thinking stages that genuine critical thinking requires. This finding has important implications for teacher education: if most graduates of undergraduate programs have not yet developed the epistemic foundations required for sophisticated critical thinking, pre-service teacher education programs cannot assume those foundations are in place.

Kuhn's Argumentative Reasoning Development. Deanna Kuhn's (1999, 2019) research on the development of argumentative reasoning provides a complementary account focused specifically on the skills involved in constructing and evaluating arguments–a core component of critical thinking. Kuhn distinguishes between three levels of argumentative competence: rhetorical argumentation (arguing to win), dialectical argumentation (arguing to resolve disagreement), and epistemic argumentation (arguing to establish truth).

At the rhetorical level, argument is understood as a competitive speech act whose purpose is to persuade an opponent. Evidence is selected and presented strategically, counterarguments are dismissed rather than engaged with, and the goal is victory rather than truth. This is the form of argumentation most students have been exposed to in everyday social life and popular media, and it is deeply resistant to critical analysis because its social function is precisely to foreclose the kind of balanced, evidence-based inquiry that critical thinking requires.

At the dialectical level, argument is understood as a cooperative enterprise aimed at resolving disagreement through the exchange of reasons and evidence. Participants at this level can acknowledge the force of counterarguments, revise their positions in response to evidence, and engage with opposing views charitably rather than dismissively. This represents a significant advance over rhetorical argumentation but remains limited by its focus on interpersonal resolution rather than epistemic inquiry.

At the epistemic level, argument is understood as a method for establishing the best-justified position in the light of available evidence and reasoning. Participants at this level engage with arguments as tools for thinking rather than as instruments for winning or securing agreement. They evaluate arguments against explicit epistemic criteria, seek out the strongest version of opposing positions (what philosophers call the principle of charity), and revise their own positions not in response to social pressure but in response to logical and evidential force. This is the level at which genuine critical inquiry becomes possible.

Kuhn's research demonstrates that epistemic argumentation is the developmental achievement of a minority of adults, even among those with advanced education. It requires not only cognitive skill but also the epistemic motivation described earlier–the genuine commitment to truth-seeking over winning, resolution, or comfort.

Synthesizing the frameworks reviewed above, we can propose an integrated five-stage developmental model of critical thinking:

Stage 1: **Absolute Knowing.** Knowledge is perceived as certain, binary, and externally authoritative. No genuine epistemic uncertainty is acknowledged. Critical evaluation of knowledge claims is neither possible nor perceived as necessary. This stage characterizes the epistemic orientation of most children and many adolescents.

Stage 2: **Transitional Knowing.** Genuine uncertainty is encountered, typically through exposure to intellectual disagreement among authorities. The response is confusion and epistemological anxiety rather than inquiry. This stage is characterized by Perry's early Multiplicity–the recognition of disagreement without the tools to evaluate it.

Stage 3: **Independent Knowing.** Uncertainty is managed through the assertion of personal perspective–all opinions are treated as equally valid, and the appeal to personal experience becomes the primary epistemic strategy. Critical evaluation of competing claims is attempted but lacks systematic methodology. This stage corresponds to Perry's late Multiplicity and King and Kitchener's Stages 4–5.

Stage 4: **Contextual Knowing.** Knowledge claims are recognized as constructions that must be evaluated against explicit criteria of evidence, reasoning, and contextual appropriateness. Systematic analysis and evaluation of arguments become possible. Epistemic commitment is achievable but sometimes accompanied by residual relativistic anxiety. This stage corresponds to Perry's Relativism and King and Kitchener's Stage 6.

Stage 5: **Integrated Critical Thinking.** Sophisticated, habitual, and epistemically mature critical thinking is achieved. The individual can analyze complex arguments, evaluate evidence systematically, construct well-justified positions, maintain intellectual humility, and engage productively with disagreement. Intellectual dispositions are fully integrated with cognitive skills and epistemic beliefs. This stage corresponds to Perry's Commitment within Relativism and King and Kitchener's Stage 7.

The structural and developmental account presented above has direct implications for how critical thinking should be taught, assessed, and supported.

The most fundamental implication of the developmental framework is that effective critical thinking instruction must be calibrated to students' actual developmental level rather than to an idealized endpoint. Presenting students at Stage 2 or 3 with complex multi-perspective argumentation tasks, without first addressing their underlying epistemic beliefs, is unlikely to produce genuine critical thinking development; it is more likely to produce either superficial compliance or defensive resistance.

Developmentally appropriate scaffolding means meeting students where they are while providing the cognitive and epistemic challenge necessary for progression. For students in the absolute knowing stage, this might involve exposing them to genuine expert disagreement, followed by guided analysis of how experts evaluate competing claims. For students in the independent knowing stage, it involves challenging the implicit epistemology of "everyone is entitled to their opinion" through structured activities that require evidence-based evaluation.

Given the central role of epistemic beliefs in enabling or constraining critical thinking, explicit attention to epistemic development should be integrated into education at all levels. This involves making the epistemic assumptions embedded in disciplinary practices visible and discussable.

Communities of inquiry serve as the primary pedagogical environment. The developmental progression described here does not occur through individual cognition alone but through participation in social practices of inquiry.

CONCLUSION

Critical thinking is a multi-layered psychological construct whose effective development requires a clear structural understanding and a longitudinal developmental perspective. At the structural level, it comprises cognitive skills, metacognitive processes, epistemic beliefs, and intellectual dispositions–four interrelated components that must be developed in coordination if genuine critical thinking is to be achieved. At the developmental level, it unfolds through a progression from absolute epistemic certainty, through transitional uncertainty and independent relativism, to contextual and, finally, integrated critical reasoning–a progression that is neither automatic nor rapid and that requires sustained, appropriately scaffolded educational support.

The practical implication of this analysis is that critical thinking education cannot be reduced to the teaching of logical fallacies, argument mapping techniques, or any other set of discrete cognitive tools, however valuable those tools may be. It requires a coherent, longitudinally informed curriculum that simultaneously addresses cognitive skill development, metacognitive awareness, epistemic belief transformation, and dispositional cultivation–within a pedagogical environment that models, practices, and rewards the habits of mind it seeks to develop.

For teacher education in particular, this analysis carries urgent implications. Teachers who have not themselves progressed to the higher stages of epistemic development described in this article cannot effectively facilitate that progression in their students; they lack both the cognitive tools and the epistemic orientation required. Investing in the genuine development of teachers' critical thinking–not through one-semester courses or weekend workshops, but through sustained, developmentally informed engagement with critical inquiry–is therefore among the highest-leverage educational interventions available to any educational system committed to sustainable intellectual development.

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13.00.00 Pedagogika fanlari
13.00.01 Pedagogika nazariyasi. Pedagogik ta’limotlar tarixi
13.00.02 Ta’lim va tarbiya nazariyasi va metodikasi (sohalar bo‘yicha)
13.00.03 Maxsus pedagogika
13.00.04 Jismoniy tarbiya va sport mashg‘ulotlari nazariyasi va metodikasi
13.00.05 Kasb-hunar ta’limi nazariyasi va metodikasi
13.00.06 Elektron ta’lim nazariyasi va metodikasi (ta’lim sohalari va bosqichlari bo‘yicha)
13.00.07 Ta’limda menejment
13.00.08 Maktabgacha ta’lim va tarbiya nazariyasi va metodikasi
13.00.09 Ijtimoiy pedagogika
07.00.00 Tarix fanlari
19.00.00 Psixologiya fanlari
01.00.00 Fizika-matematika fanlari
02.00.00 Kimyo fanlari
03.00.00 Biologiya fanlari
09.00.00 Falsafa fanlari
10.00.00 Filologiya fanlari
11.00.00 Geografiya fanlari

MAKTABGACHA VA MAKTAB TA'LIMI

Mas'ul muharrir: Ramzidin Ashurov
Ingliz tili muharriri: Murod Xoliyorov
Musahhih: Alibek Zokirov
Sahifalovchi va dizayner: Iskandar Islomov

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"Maktabgacha va maktab ta'limi" jurnali 26.09.2023-yildan
O'zbekiston Respublikasi Prezidenti Adminstratsiyasi huzuridagi
Axborot va ommaviy kommunikatsiyalar agentligi tomonidan
№C–5669363 reyestr raqami tartibi bo'yicha ro'yxatdan o'tkazilgan.
Litsenziya raqami: № 136361.

Manzilimiz: Toshkent shahar, Yunusobod tumani
19-mavze, 17-uy.