

RESEARCH ARTICLE

Evidence Based Critical Thinking in Pre-Service Physical Education Teacher Education

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Abstract

Critical thinking in physical education (PE) teacher education is often described as a general graduate attribute, yet such wording does not specify what a prospective teacher must actually do when movement, safety, inclusion, and limited lesson time create competing demands. This conceptual study synthesizes two author manuscripts, national policy documents, foundational critical-thinking scholarship, and recent international research published through 2026. Qualitative content analysis and pedagogical modelling were used to construct a profession-specific framework. The resulting Evidence-to-Action Cycle comprises five recursive operations: defining a professional problem, collecting and checking evidence, comparing alternatives against explicit criteria, testing a decision in action, and reflecting for self-correction. The framework links cognitive skills with dispositions and observable teaching performance. It is operationalized through problem-based tasks, case analysis, tactical games, video-supported microteaching, peer assessment, and reflective records. A four-level analytic rubric is proposed to evaluate reasoning quality without confusing verbal fluency with professional competence. The study argues that critical thinking becomes educationally meaningful in PE only when a decision is both reasoned and embodied: it must be justified in language, tested through safe pedagogical action, and revised when learner or performance evidence contradicts the initial judgment. The framework offers an empirically testable basis for curriculum design and doctoral research in pre-service PE teacher education.

KEYWORDS

Critical thinking; physical education teacher education; evidence-based decision making; pedagogical judgment; reflection; microteaching; assessment rubric.

INTRODUCTION

In A physical education teacher does not merely reproduce a predetermined sequence of exercises. During a lesson, the teacher interprets movement quality, monitors fatigue and safety, adjusts task difficulty, protects inclusion, manages space and equipment, and explains why a chosen intervention is educationally defensible. These decisions are time-sensitive, but speed does not remove the need for evidence. It increases the importance of disciplined judgment. Accordingly, critical thinking in pre-service PE education should be defined through

the professional decisions that connect pedagogical purposes with bodily action, not through broad claims about independent thinking.

The policy context in Uzbekistan supports this interpretation. The Law on Education requires the development of learners capable of independent thought and analysis [1]. The Uzbekistan 2030 Strategy links the quality of higher education with wider participation in physical activity [2], while the Law

on Physical Culture and Sports requires educational provision to account for health and individual capability [3]. Read together, these norms create a concrete teacher-education requirement: prospective PE teachers must be able to justify, adapt, and evaluate instructional decisions under conditions of learner variability.

The conceptual problem is that three bodies of knowledge are frequently separated. General critical-thinking research specifies analysis, evaluation, inference, explanation, and self-regulation [4,5]; PE scholarship emphasizes tactical choice, motor performance, and questioning [6-9]; teacher-competence research distinguishes declarative knowledge, situation-specific interpretation, and observable performance [15]. A curriculum may therefore teach critical-thinking terminology without changing practical decisions, or it may encourage active participation without requiring evidence and self-correction. The present study addresses this gap by asking: What profession-specific structure, teaching methods, and assessment indicators can make critical thinking observable in pre-service PE teacher education?

METHODS

The study employed a conceptual synthesis rather than an intervention design. Its corpus consisted of two author

manuscripts, three national policy documents, foundational sources on critical thinking, peer-reviewed studies specific to PE and sport pedagogy, and recent studies on reflection, epistemic judgment, professional competence, and assessment published from 2023 to 2026. Sources were included when they clarified at least one of four analytic categories: cognitive operation, professional situation, pedagogical method, or assessable performance. Historical descriptions that did not explain critical-thinking development were excluded from the final model.

Analysis proceeded in three stages. First, recurrent constructs were coded: problem identification, evidence appraisal, generation of alternatives, criterion-based choice, practical testing, and self-correction. Second, the constructs were mapped onto recurring PE demands, including safety, workload differentiation, movement diagnosis, tactical choice, classroom management, and inclusive participation. Third, pedagogical modelling was used to convert the map into a recursive cycle and a performance rubric. Because no new participant data were collected, the article does not report causal effects or invented percentages. Its contribution is a testable theoretical model and an operational assessment design.

Table 1. From generic critical thinking to profession specific PE judgment

Analytic problem	Insufficient formulation	Profession-specific formulation	Observable evidence
Problem definition	"Think independently"	Identify the instructional conflict and missing information	Names the learner need, safety issue, or tactical constraint
Evidence	"Give an opinion"	Separate observation, measurement, rule, and assumption	Uses video, pulse, task outcome, or observation record
Alternatives	"Find the correct answer"	Generate at least two viable pedagogical or movement solutions	Compares task variants or teaching cues
Decision	"Choose a method"	Apply explicit criteria: safety, learning goal, inclusion, feasibility	Explains why one option fits this group and moment
Revision	"Write a reflection"	Change the decision when new evidence contradicts it	Documents what changed, why, and with what result

RESULTS

Facione defines critical thinking as “purposeful, self-regulatory judgment” [4]. The phrase is particularly useful for PE because it combines direction with correction: a teacher acts toward a learning purpose but must remain able to revise the action. Ennis likewise connects critical thinking with deciding what to believe or do [5]. In PE, “do” is not metaphorical. A conclusion becomes professionally credible only when it informs a safe instructional action and survives comparison with subsequent learner evidence.

McBride transferred critical thinking into PE by emphasizing multiple solutions to movement problems and reasoned evaluation rather than repetition of a single prescribed response [6]. Lodewyk further linked reflective judgment with defensible movement decisions [8]. Experimental work with creative drama suggests that active and role-based experiences can support critical-thinking development among pre-service PE teachers [10], while active-learning research points to the value of structured questions, collaboration, and learner agency [11]. These findings support an embedded approach: reasoning should be taught inside sport-pedagogical content rather than confined to a detached lecture on critical thinking.

Recent research sharpens the model. Grecic et al. describe professional judgment as epistemic: teachers must examine what they count as knowledge and which hidden influences

shape their decisions [14]. Berthold et al., using data from 877 pre-service teachers, validated a measure of evidence-based classroom-management knowledge and showed why objective knowledge and situation-specific skills should be distinguished [15]. Zhou et al. reviewed 46 PE reflection studies and found that reflection is strongest when continuous, multidimensional, methodologically diverse, and supported by an open environment [16]. Royet et al. identified discrepancies between self-reported and externally assessed professional competence [17]. Together, these studies rule out reflection based only on personal impressions and justify triangulation across reasoning, observation, and performance.

The proposed cycle has five recursive operations. First, the student defines a professional problem precisely enough to expose its tension: for example, maintaining moderate-to-vigorous activity while safely differentiating an interval task for learners with different fitness levels. Second, the student collects and checks evidence, distinguishing observed movement signs and measured responses from assumptions. Third, alternatives are compared against stated criteria. Fourth, the selected option is tested through microteaching, a movement task, or a tactical episode. Fifth, the student compares the predicted and observed results, explains discrepancies, and either retains or revises the decision. The cycle is recursive because a new safety sign or learner response can reopen the original problem definition.

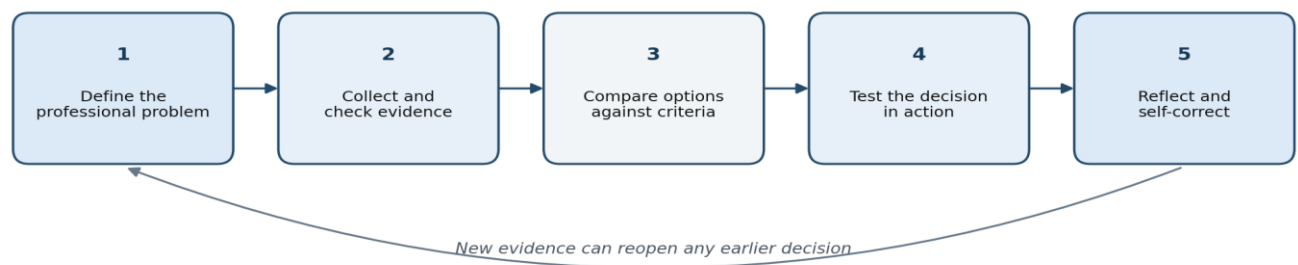


Figure 1. Evidence to Action Cycle for critical thinking in physical education teacher education

Table 2. Didactic implementation of the cycle

Cycle operation	Teacher prompt	Student action	Product for assessment
Define	What exactly conflicts, and	Frames a bounded	Problem statement and

	what information is missing?	pedagogical or tactical problem	information-needs list
Check evidence	Which claim is observed, measured, inferred, or assumed?	Triangulates movement, health, contextual, and rule-based evidence	Annotated video or observation protocol
Compare	Which alternatives meet safety, learning, inclusion, and feasibility criteria?	Builds and weighs at least two options	Decision matrix or oral defense
Test	What outcome would support or weaken your choice?	Implements the option in a constrained task or micro-lesson	Performance record and learner-response data
Self-correct	What changed your judgment?	Revises the plan and explains the revision	Reflective memo linked to evidence

Problem-based learning initiates the cycle when the problem contains a genuine decision rather than a hidden answer. Case analysis adds contextual complexity, including medical restrictions, low motivation, equipment shortages, or disputed assessment. Tactical games create time-bounded choices whose consequences can be observed. Collaborative roles - performer, observer, analyst, and questioner - distribute attention without dissolving individual accountability. Video-supported microteaching makes otherwise fleeting evidence reviewable, and a brief reflective record converts experience into a traceable claim-evidence-revision sequence.

The quality of questioning determines whether these methods develop reasoning or merely increase activity. "How is the skill performed?" checks recall. "Which variation is safer for this group, what evidence supports that judgment, and what observation would make you change it?" elicits criteria, evidence, and falsifiability. The instructor acts as a facilitator of standards: the teacher delays the answer, probes evidence quality, and preserves the distinction between respect for diverse views and the false claim that all solutions are equally defensible.

Table 3. Worked case for differentiated relay training

Case element	Specification
Situation	A mixed-readiness class completes relay intervals. Two learners show early fatigue; one has a documented limitation. Equipment and lesson time are restricted.
Decision question	How should the teacher differentiate workload while preserving participation, safety, and the lesson objective?
Required evidence	Medical guidance; observed technique; talk-test or pulse response; recovery time; task rules; available space and equipment.
Alternatives	A: reduce distance for selected learners. B: preserve distance but modify work-rest ratio and role rotation. C: use station-based intensity bands.
Criteria	Safety first; equivalent learning opportunity; manageable organization; transparent and non-stigmatizing differentiation.
Test and revision	Pilot one interval, record responses, compare them with predicted tolerance, and revise intensity or grouping before the next round.

Assessment architecture. Assessment should not rely on a generic critical-thinking test alone because PE reasoning is

embodied, contextual, and safety-sensitive. A defensible assessment package combines a written case, an oral

justification, an observed movement or teaching task, a structured observation protocol, and a short reflective report. The same claim should therefore be examined through more than one data source. This design also reduces a recurrent

bias: verbally fluent students should not automatically outscore students who communicate briefly but diagnose movement accurately and make a safer correction.

Table 4. Analytic rubric for evidence-based PE judgment

Criterion	Level 1 Unsupported	Level 2 Emerging	Level 3 Reasoned	Level 4 Self-correcting
Problem framing	Restates the task	Identifies one issue but misses constraints	Defines conflict, constraints, and missing information	Reframes the problem when new evidence changes its boundaries
Evidence appraisal	Offers opinion only	Uses evidence without checking its status	Distinguishes observation, measure, inference, and assumption	Triangulates sources and explains uncertainty or contradiction
Alternatives and criteria	Names one option	Lists options without stable criteria	Compares viable options using explicit professional criteria	Reweights criteria transparently when context changes
Action quality	Action is unsafe or unrelated	Action partly fits the goal	Action is safe, feasible, inclusive, and goal-aligned	Monitors consequences and makes a timely, justified adjustment
Reflection	Reports feelings or outcome	Names a change without evidence	Links result to the original prediction and evidence	Explains why the initial judgment failed and transfers the lesson cautiously

DISCUSSION

The synthesis advances the literature in three ways. First, it locates critical thinking inside professional action rather than treating it as an external academic skill. Second, it separates evidence from opinion and self-report from observed performance. Third, it defines self-correction as the highest level of performance. A student who gives the initially expected answer but ignores contradictory learner evidence demonstrates less critical thinking than a student who revises a plausible decision transparently.

This position is compatible with tactical and game-based pedagogies, but it imposes a stronger evidentiary standard. The recent tactical critical-thinking case study by Gaviria Alzate et al. connects decision making with declarative and procedural knowledge in football [13]. The present model extends that logic beyond tactics to workload, inclusion, classroom management, and pedagogical safety. It also

incorporates reflection as an ongoing process rather than an end-of-unit ritual, consistent with the 2025 review of PE self-reflection [16].

Implementation carries three risks. First, an unstructured group discussion may be mislabeled as critical thinking. Discussion contributes only when participants state claims, evidence, criteria, and revision conditions. Second, excessive talk may reduce meaningful physical activity. This can be prevented through short evidence pauses, paired analysis during recovery, and two-minute post-task reflection. Third, technology may produce data without judgment. Video, wearables, or digital dashboards are useful only when students question data quality, interpret the measure within the learning goal, and avoid treating measurement as a substitute for professional responsibility. The emerging digital-literacy framework for pre-service PE teachers similarly prioritizes integration competence over declarative tool

knowledge [19].

The framework also clarifies a doctoral research agenda. A subsequent study can validate the rubric through expert review, inter-rater agreement, and factor analysis; compare rubric scores with situation-specific knowledge measures; and test whether a structured cycle improves decision quality across microteaching and school practicum. Such a design should report fidelity, task difficulty, and transfer, not only pre-post mean differences. Emotional and dispositional conditions should also be examined, since current teacher-education research links critical-thinking disposition with resilience and emotional intelligence [18].

LIMITATIONS

This article is a conceptual study based on selective synthesis, not a systematic review or an experimental evaluation. The model therefore explains what should be tested; it does not establish an effect size. The recent studies were conducted in different educational systems, and their constructs cannot be transferred to Uzbekistan without contextual validation. In addition, the proposed rubric may be sensitive to the design of the professional task and to assessor training. These limitations are addressed by making the indicators explicit and by recommending multi-source evidence and future psychometric testing.

CONCLUSION

Critical thinking in pre-service PE teacher education is the disciplined capacity to define a professional problem, appraise evidence, compare alternatives, act safely, and revise a decision in response to observed consequences. Its defining feature is not extended classroom discussion but the integration of reasoned explanation with embodied, ethically responsible pedagogical action. The Evidence-to-Action Cycle translates this definition into teachable operations and assessable products.

For curriculum design, critical thinking should be embedded across sport pedagogy, biomechanics, physiology, assessment, microteaching, and school practicum. Problem-based tasks, worked cases, tactical games, video analysis, peer observation, and structured reflection should be aligned with a common rubric. For research, the immediate priority is to validate the model and establish whether it improves the accuracy, safety, transfer, and self-correction of prospective teachers' decisions. This approach replaces general statements about "developing thinking" with an accountable

professional standard.

REFERENCES

1. Republic of Uzbekistan. Law on Education, No. ZRU-637, 23 September 2020. <https://lex.uz/docs/5013007>
2. President of the Republic of Uzbekistan. Decree on the Uzbekistan 2030 Strategy, No. PF-158, 11 September 2023. <https://lex.uz/docs/6600413>
3. Republic of Uzbekistan. Law on Physical Culture and Sports, No. ZRU-394, 4 September 2015. <https://lex.uz/docs/2742233>
4. Facione PA. Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction. The Delphi Report. Millbrae, CA: California Academic Press; 1990. ERIC ED315423.
5. Ennis RH. Critical Thinking. Upper Saddle River, NJ: Prentice Hall; 2011.
6. McBride RE. Critical thinking - an overview with implications for physical education. *Journal of Teaching in Physical Education*. 1992;11(2):112-125. <https://doi.org/10.1123/jtpe.11.2.112>
7. McBride RE, Xiang P, Wittenburg D, Shen J. An analysis of preservice teachers' dispositions toward critical thinking: a cross-cultural perspective. *Asia-Pacific Journal of Teacher Education*. 2002;30(2):131-140. <https://doi.org/10.1080/13598660220135649>
8. Lodewyk KR. Fostering critical thinking in physical education students. *Journal of Physical Education, Recreation & Dance*. 2009;80(8):12-18. <https://doi.org/10.1080/07303084.2009.10598368>
9. Pill S, SueSee B. Including critical thinking and problem solving in physical education. *Journal of Physical Education, Recreation & Dance*. 2017;88(9):43-49. <https://doi.org/10.1080/07303084.2017.1367741>
10. Uzunöz FS, Demirhan G. The effect of creative drama on critical thinking in preservice physical education teachers. *Thinking Skills and Creativity*. 2017;24:164-174. <https://doi.org/10.1016/j.tsc.2017.02.018>
11. Hidayat C, Lengkana AS, Rohyana A, Purwanto D, Rosalina M. Motivating active learning in physical education: critical thinking. *European Journal of Educational Research*. 2023;12(2):1137-1151.

<https://doi.org/10.12973/eu-jer.12.2.1137>

- 12.** Halpern DF. Thought and Knowledge: An Introduction to Critical Thinking. 5th ed. New York: Psychology Press; 2014.
- 13.** Gaviria Alzate SJ, et al. Tactical critical thinking program on the tactical efficiency index, declarative and procedural knowledge in male soccer players: a case study. *Frontiers in Sports and Active Living*. 2024;6:1469347. <https://doi.org/10.3389/fspor.2024.1469347>
- 14.** Grecic D, Sprake A, Thomson A, Christodoulides E, Palmer C. The epistemic judgement framework: a reflexive tool for physical education teachers' professional development to support Quality Physical Education. *Frontiers in Education*. 2024;9:1480690. <https://doi.org/10.3389/feduc.2024.1480690>
- 15.** Berthold C, Jeisy E, Baumgartner M. Pre-service teachers' knowledge of evidence-based classroom management practices in physical education: a test validation using item response theory. *Frontiers in Education*. 2025;10:1570510. <https://doi.org/10.3389/feduc.2025.1570510>
- 16.** Zhou T, Bubnys R, Grajauskas L, Cañabate D, Colomer J. Modes of self-reflection in physical education instruction. *Frontiers in Education*. 2025;10:1645817. <https://doi.org/10.3389/feduc.2025.1645817>
- 17.** Royet T, Cece V, Lentillon-Kaestner V, Castéra J, Vors O. Preservice physical education teachers' professional action competence in education for sustainability: a mixed method research. *Frontiers in Psychology*. 2025;16:1601026. <https://doi.org/10.3389/fpsyg.2025.1601026>
- 18.** Zhao Y, Ai L. Potential key factors? Exploring the predictive role and necessity of emotional intelligence and resilience for pre-service teachers' critical thinking disposition. *Frontiers in Education*. 2026;11:1729435. <https://doi.org/10.3389/feduc.2026.1729435>
- 19.** Zhao S, et al. Developing and validating a digital literacy assessment framework for pre-service physical education teachers: a Delphi-AHP study. *Frontiers in Psychology*. 2026;17:1852701. <https://doi.org/10.3389/fpsyg.2026.1852701>