© 2026 International Conference on Multidisciplinary Sciences and Innovations . All Rights Reserved.

PEDAGOGICAL FACTORS IN DEVELOPING CRITICAL THINKING AMONG PROSPECTIVE PHYSICAL EDUCATION TEACHERS

Khasanov Javohir Mukhtorovich
Independent Researcher, Bukhara State Pedagogical Institute

Abstract. This theoretical and methodological study identifies the pedagogical factors that enable prospective physical education teachers to develop critical thinking as evidence-based professional judgment. Content analysis, comparative synthesis, pedagogical modelling and case construction were used. Six interdependent factors are substantiated: a problem-oriented curriculum, inquiry-based facilitation, dialogic cooperation, reflective metacognition, formative assessment, and authentic inclusive practice. The proposed model links these factors to analysis, evaluation, inference, explanation and self-correction in movement-related decisions. Two instructional cases demonstrate how the model can guide safe load differentiation and tactically informed, inclusive assessment. The cases are design examples rather than reported experimental outcomes. The article concludes that critical thinking becomes professionally meaningful when reasoning is embedded in movement, safety, inclusion and assessment decisions rather than taught as an isolated theory.

Keywords. critical thinking, physical education teacher education, pedagogical factors, professional judgment, reflective practice, formative assessment, case-based learning.

ПЕДАГОГИЧЕСКИЕ ФАКТОРЫ ФОРМИРОВАНИЯ КРИТИЧЕСКОГО МЫШЛЕНИЯ У БУДУЩИХ УЧИТЕЛЕЙ ФИЗИЧЕСКОЙ КУЛЬТУРЫ

Аннотация. В статье систематизированы педагогические факторы развития критического мышления будущих учителей физической культуры как доказательного профессионального суждения. Обоснованы проблемно-ориентированное содержание, исследовательская фасилитация, диалогическое сотрудничество, рефлексивная метакогниция, формирующее оценивание и аутентичная инклюзивная практика. Модель раскрыта посредством двух профессиональных кейсов.

Ключевые слова. критическое мышление, подготовка учителя физической культуры, педагогический фактор, рефлексия, формирующее оценивание, кейс.

Introduction. A prospective physical education (PE) teacher must interpret movement quality, recognise safety risks, adapt workload, sustain motivation and make equitable assessment decisions within a rapidly changing lesson. These decisions cannot be reduced to technical execution or the reproduction of a lesson plan. They require the ability to distinguish observation from assumption, compare alternatives, explain a choice and revise it when new evidence appears. Critical thinking is therefore a professional capability through which disciplinary knowledge becomes responsible pedagogical action**.**

The need is also consistent with Uzbekistan's educational policy. The Law on Education identifies independent thinking and analysis among the outcomes of general education [12], while the Uzbekistan 2030 Strategy connects higher-education quality with the development of human capital and wider participation in physical culture and sport [13]. The Law on Physical Culture and Sport requires attention to individual abilities and health conditions [14]. These provisions make the quality of teacher judgment, rather than the mere possession of methodological information, a central issue in PE teacher education (PETE).

© 2026 International Conference on Multidisciplinary Sciences and Innovations . All Rights Reserved.

Purpose and Methods. The purpose of the study is to substantiate a system of pedagogical factors that supports critical thinking among prospective PE teachers and to translate that system into case-based learning procedures. The study used conceptual analysis of critical-thinking constructs, comparative synthesis of PETE research, content analysis of policy documents, pedagogical modelling and case construction. No empirical effect is claimed: the model and cases constitute a theoretically grounded design for subsequent expert validation and experimental testing.

Theoretical Framework. The Delphi study coordinated by Facione defines critical thinking as "purposeful, self-regulatory judgment" and specifies interpretation, analysis, evaluation, inference, explanation and self-regulation as its core skills [1, p. 3]. A meta-analysis by Abrami et al. found stronger educational effects when explicit critical-thinking instruction was combined with dialogue, authentic problems and opportunities to apply thinking within subject content [2]. This evidence suggests that PETE programmes should make reasoning processes visible while keeping them connected to movement and teaching practice.

In PE, McBride describes critical thinking as "reflective thinking that is used to make reasonable and defensible decisions about movement" [3, p. 115]. The definition is significant because movement provides observable evidence: changes in balance, timing, space, fatigue and cooperation can confirm or challenge a decision. Liu et al. nevertheless identified a gap between preservice teachers' general understanding of critical thinking and their ability to apply it in teaching situations [4]. Pedagogical factors must therefore bridge declarative knowledge and situated action.

The term pedagogical factor is used here to denote a controllable feature of curriculum, instruction, interaction, assessment or practice placement that influences how students engage in reasoning. It differs from a principle, which states a normative rule, and from a method, which specifies a concrete procedure. A factor may be strengthened through several methods and should be evaluated by the thinking behaviour it elicits. The proposed system is shown in Figure 1.

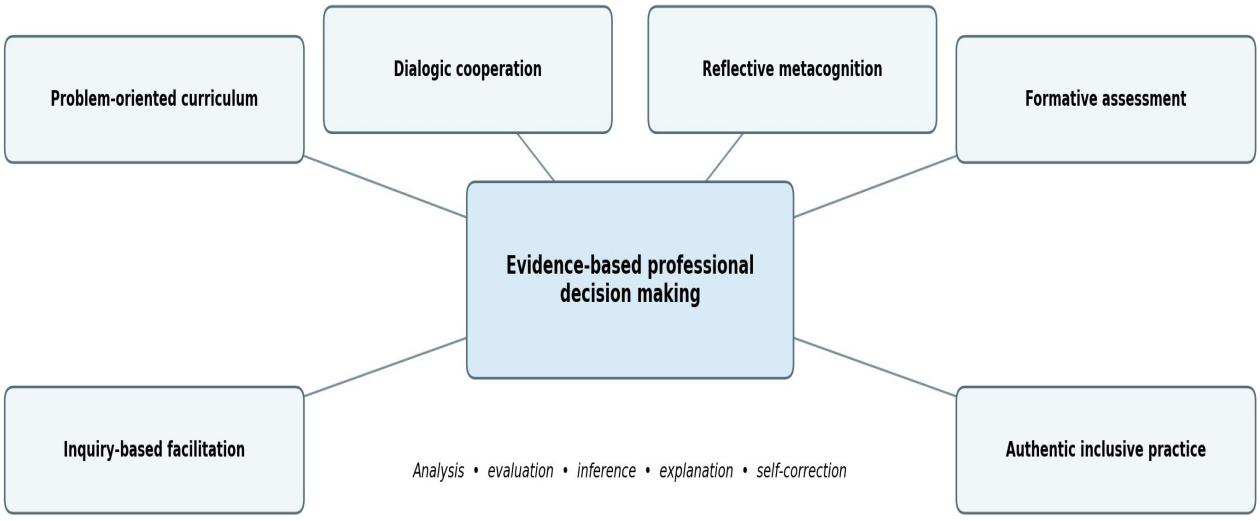


Figure 1. System of pedagogical factors leading to evidence-based professional judgment

Pedagogical Factors. Critical thinking is activated when content contains a genuine decision rather than a predetermined answer. In PETE, productive problems combine a movement goal with constraints such as safety, heterogeneous readiness, limited equipment or competing assessment criteria. Tactical games, error analysis and case-based lesson planning require students to generate and test more than one solution. Pill and SueSee show how questioning and problem solving can be integrated into PE without separating cognitive work from physical participation [5]. A well-designed

© 2026 International Conference on Multidisciplinary Sciences and Innovations . All Rights Reserved.

task states the problem, relevant constraints and criteria for a defensible decision, but does not prescribe the route.

The educator's role is to model disciplined inquiry and gradually transfer responsibility to students. Questions such as "What did you observe?", "Which evidence supports that interpretation?", "What alternative would reduce risk?" and "What would change your decision?" expose the structure of judgment. Prompting should move from observation to explanation and evaluation; otherwise discussion remains descriptive. Direct explanation is still appropriate for non-negotiable safety knowledge, but it should be followed by an application problem in which students justify how that knowledge changes their plan.

Reasoning improves when claims are made public and examined by peers. Structured roles—observer, evidence checker, alternative generator and decision defender—prevent group work from becoming an unregulated exchange of opinions. Research reviews indicate that cooperative learning in PE can support cognitive, social, affective and physical outcomes, while also warning that implementation must include individual accountability and adequate duration [6; 7]. Dialogue functions as a quality-control mechanism: agreement is less important than whether a claim is relevant, accurate and responsive to counter-evidence.

Pedagogical Factors and Their Operationalisation

Reflective metacognition. Reflection enables students to inspect not only what happened but also how their assumptions shaped the result. Video-supported microteaching, stimulated recall and short reflective journals can connect an intention with observable consequences. Capella-Peris et al. reported, in a mixed-method study of 20 PETE students, that critical-pedagogy experiences supported teaching competency and that reflective journals helped explain the development process [8]. Reflection is productive when it names the initial claim, identifies confirming or disconfirming evidence, and specifies a revised action; a general statement such as "the lesson went well" is insufficient.

Formative assessment and feedback. Assessment shapes what students treat as valuable. If only technical performance or recall is graded, there is little incentive to analyse evidence or revise a decision. A critical-thinking rubric should therefore separate problem framing, evidence quality, alternative generation, safety and inclusion, justification, and self-correction. Slingerland et al.'s 18-month study with 15 PE teachers shows both the potential of formative activities and the need for sustained professional learning during implementation [9]. Shared criteria, peer feedback and self-assessment turn evaluation into information for the next action rather than a final verdict.

Authentic inclusive practice. Critical judgment must be exercised under conditions resembling professional work. School observations, microteaching, video cases and supervised practicum tasks expose students to uncertainty, time pressure and learner diversity. Critical pedagogy in PE additionally asks whose participation, bodies and forms of competence are privileged by a task [10]. Authenticity is therefore not mere realism; it requires students to examine health status, disability, gendered expectations, access to equipment and prior experience. An inclusive adaptation preserves a common learning purpose while offering safe and meaningful routes to it.

© 2026 International Conference on Multidisciplinary Sciences and Innovations . All Rights Reserved.

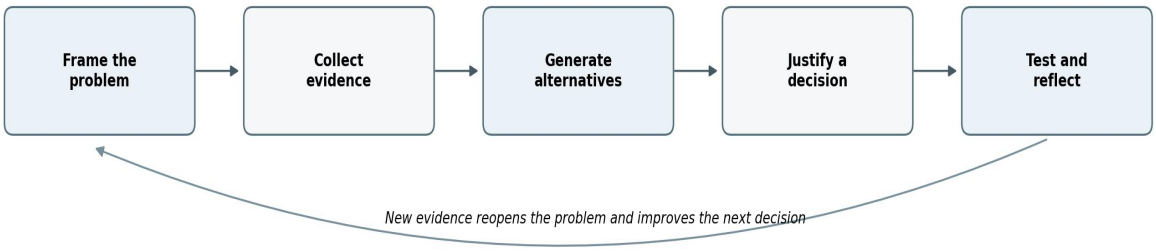


Figure 2. Evidence-guided professional case cycle

Table 1. Operational indicators of the factor system

Factor	Observable student action	Instructional evidence
Problem orientation	Frames a dilemma and compares viable options	Scenario constraints; decision criteria
Inquiry facilitation	Distinguishes observations, assumptions and claims	Question sequence; evidence log
Dialogic cooperation	Tests peer claims and answers counterarguments	Assigned roles; discussion protocol
Reflective metacognition	Revises an initial decision using outcomes	Video recall; reflective journal
Formative assessment	Uses criteria to improve the next attempt	Analytic rubric; peer feedback
Authentic inclusion	Adapts a shared goal to learner variability	School case; practicum observation

The factors operate as a system. A problem without evidence encourages speculation; evidence without dialogue encourages compliance; feedback without a second attempt cannot generate self-correction. For practical planning, each PETE task should include a professional dilemma, accessible evidence, at least two alternatives, explicit decision criteria and an opportunity to revise action after movement or teaching has been observed.

Professional Cases. The following cases are instructional designs. They demonstrate how the proposed factors can be embedded in seminar, microteaching and practicum work; they are not presented as data from a completed intervention.

Case 1. Safe differentiation of circuit training

Situation. A prospective teacher plans a six-station circuit for a Grade 7 class. The class includes highly trained pupils, two pupils who fatigue quickly and one pupil advised to avoid high-impact loading on the knee. Equipment is limited, but the learning purpose—developing general endurance—must remain common. The initial plan assigns the same repetitions and work interval to everyone.

Critical question. How can the workload be differentiated without isolating pupils, weakening the common purpose or compromising safety?

Reasoning stage	Evidence to examine	Defensible response
Frame	Medical guidance, baseline readiness, movement quality	Keep the endurance goal; vary load parameters and movement form

© 2026 International Conference on Multidisciplinary Sciences and Innovations . All Rights Reserved.

Compare	Impact, work–rest ratio, amplitude, technique	Prepare A, B and adapted C options at each station
Safeguard	Pain, loss of technique, breathing and fatigue signs	Use stop criteria, observation points and active recovery
Reflect	Post-task response and quality across rounds	Revise interval, complexity or recovery for the next lesson

Reasoned solution. The student replaces high-impact jumps, where necessary, with controlled step-ups or a low-impact resistance task. Load is differentiated through time, recovery, amplitude and movement complexity rather than through public labels such as "strong" and "weak." Each pupil selects a coded option with teacher oversight. Movement quality, reported exertion and warning signs provide evidence for adjustment. The solution activates problem orientation, inquiry, authentic inclusion and reflective assessment while preserving the shared endurance objective.

Case 2. Tactical reasoning and equitable volleyball assessment.

Situation. In a volleyball micro-lesson, Student A produces powerful attacks but rarely passes to teammates and cannot explain tactical choices. Student B has moderate technical performance but identifies open space, supports teammates, selects safer positioning and uses video evidence to correct an error. A score based only on successful points would rank Student A substantially higher.

Critical question. How should assessment combine performance, tactical reasoning, cooperation and reflection without making technical competence irrelevant?

Criterion	Weight	Indicator	Evidence
Technical execution	30%	Accuracy, control and safety	Observation and video
Tactical decision	30%	Use of space and situation-appropriate choice	Selected game episode
Cooperation	20%	Distribution of play and support for peers	Team interaction record
Reflection	20%	Evidence-based explanation and correction	Short reflection note

Reasoned solution. The analytic rubric retains technical quality but prevents a single performance indicator from defining competence. Before assessment, students interpret the criteria using two contrasting video episodes. Peer feedback must cite an observable episode and propose one next action. Each student then justifies a self-rating and revises one tactical choice in a second game. This process recognises Student A's execution while making the cooperative and explanatory gap visible; it also credits Student B's tactical judgment without concealing technical needs. The design combines dialogue, formative feedback and self-correction.

Discussion. The model explains why isolated teaching techniques often produce limited transfer. A debate may generate verbal activity without movement evidence; a reflective journal may become descriptive when no claim is revisited; a realistic case may reproduce exclusion if participation and assessment criteria are not examined. The pedagogical value lies in alignment: the curriculum poses a consequential problem, the educator models inquiry, peers test claims, assessment rewards justified revision, and practice supplies observable consequences.

This alignment also protects the motor character of PE. Critical thinking does not require replacing activity with lengthy classroom discussion. It can be organised as a short prediction before

© 2026 International Conference on Multidisciplinary Sciences and Innovations . All Rights Reserved.

performance, a focused observation cue during movement, and a two-minute evidence-based reflection afterwards. The movement outcome becomes feedback. In this form, cognition and action are mutually corrective rather than competing uses of lesson time.

The study is limited by its conceptual design. The proposed factors should next undergo expert review for content validity and be operationalised in a PETE module. A quasi-experimental or mixed-method study could compare baseline and post-intervention performance using scenario-based tasks, observed microteaching, reflective writing and an analytic rubric. Fidelity data would be necessary because cooperative learning and formative assessment depend heavily on how consistently their defining features are implemented [6; 9].

Conclusion. Critical thinking among prospective PE teachers develops when six pedagogical factors operate together: problem-oriented curriculum, inquiry-based facilitation, dialogic cooperation, reflective metacognition, formative assessment, and authentic inclusive practice. Their common outcome is not criticism for its own sake but evidence-based professional judgment that can be explained, tested and corrected.

The two cases show how the factor system can transform familiar PETE tasks. Safe workload differentiation requires students to integrate health evidence, movement quality and inclusion; equitable volleyball assessment requires them to balance technical execution with tactics, cooperation and reflection. Embedding such cycles across subject courses and practicum can prepare future teachers to make safer, fairer and more educationally defensible decisions.

References

1. Facione, P. A. (1990). Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction. California Academic Press. ERIC ED315423.
2. Abrami, P. C., Bernard, R. M., Borokhovski, E., Waddington, D. I., Wade, C. A., & Persson, T. (2015). Strategies for teaching students to think critically: A meta-analysis. Review of Educational Research, 85(2), 275–314. https://doi.org/10.3102/0034654314551063
3. McBride, R. E. (1992). Critical thinking—An overview with implications for physical education. Journal of Teaching in Physical Education, 11(2), 112–125. https://doi.org/10.1123/jtpe.11.2.112
4. Liu, J., McBride, R. E., Xiang, P., & Scarmardo-Rhodes, M. (2018). Physical education pre-service teachers' understanding, application, and development of critical thinking. Quest, 70(1), 12–27. https://doi.org/10.1080/00336297.2017.1330218
5. Pill, S., & SueSee, B. (2017). Including critical thinking and problem solving in physical education. Journal of Physical Education, Recreation & Dance, 88(9), 43–49. https://doi.org/10.1080/07303084.2017.1367741
6. Bores-García, D., Hortigüela-Alcalá, D., Fernandez-Rio, F. J., González-Calvo, G., & Barba-Martín, R. (2021). Research on cooperative learning in physical education: Systematic review of the last five years. Research Quarterly for Exercise and Sport, 92(1), 146–155. https://doi.org/10.1080/02701367.2020.1719276
7. Casey, A., & Goodyear, V. A. (2015). Can cooperative learning achieve the four learning outcomes of physical education? A review of literature. Quest, 67(1), 56–72. https://doi.org/10.1080/00336297.2014.984733
8. Capella-Peris, C., Salvador-Garcia, C., Maravé-Vivas, M., & Chiva-Bartoll, O. (2025). Development of teaching competency in physical education teacher education students through critical pedagogy. Journal of Teaching in Physical Education, 1–9. https://doi.org/10.1123/JTPE.2024-0422
9. Slingerland, M., Weeldenburg, G., & Borghouts, L. (2024). Formative assessment in physical education: Teachers' experiences when designing and implementing formative assessment activities. European Physical Education Review. https://doi.org/10.1177/1356336X241237398

© 2026 International Conference on Multidisciplinary Sciences and Innovations . All Rights Reserved.

10. Lynch, S., & Ovens, A. (2022). Critical pedagogy in physical education. In Encyclopedia of Teacher Education (pp. 315–319). Springer. https://doi.org/10.1007/978-981-16-8679-5_417
11. Lodewyk, K. R. (2009). Fostering critical thinking in physical education students. Journal of Physical Education, Recreation & Dance, 80(8), 12–18. https://doi.org/10.1080/07303084.2009.10598368
12. Republic of Uzbekistan. (2020). Law on Education, No. O‘RQ-637, 23 September. https://lex.uz/docs/-5013007
13. President of the Republic of Uzbekistan. (2023). Decree on the Uzbekistan 2030 Strategy, No. PF-158, 11 September. https://lex.uz/docs/-6600413
14. Republic of Uzbekistan. (2015). Law on Physical Culture and Sport, No. O‘RQ-394, 4 September. https://lex.uz/docs/-2742233