



## CONCEPTUAL AND STRUCTURAL MODEL OF PROFESSIONAL-PEDAGOGICAL CULTURE FORMATION IN FUTURE PHYSICAL EDUCATION TEACHERS

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**Abstract.** The article presents a conceptual and structural model for the formation of professional-pedagogical culture among future physical education teachers. The proposed model integrates motivational, cognitive, technological, and reflective components that ensure the holistic development of pedagogical competencies. Based on the principles of competency-based, activity-based, and humanistic approaches, the model describes the interrelations between the teacher's professional values, skills, and creative self-realization. The research results confirm the effectiveness of the model in improving the quality of professional preparation of physical education students.

**Keywords:** professional-pedagogical culture, physical education, conceptual model, pedagogical competence, structural components, competency-based approach.

### Introduction

Modern education systems are undergoing profound transformations that require teachers to possess not only subject knowledge but also **high-level professional-pedagogical culture (PPC)**. In the field of **physical education (PE)**, this culture reflects the teacher's ability to combine methodological mastery, ethical norms, communication skills, and personal motivation for continuous professional growth.

In Uzbekistan, reforms in higher education emphasize the integration of *competency-based approaches* and *innovative technologies* into teacher training programs. Developing a **conceptual and structural model** of PPC formation helps systematize this process and identify pedagogical conditions that foster professional development.

### Literature Review

Previous studies (Glazkova et al., 2020; Ortega et al., 2019; Karaikos et al., 2023) have shown that the development of pedagogical culture depends on the alignment of **educational values, didactic competence, and reflective practice**. However, research focused specifically on **physical education students** remains limited.

A conceptual model of PPC formation must integrate:

- **Value-based components** (professional ethics, motivation, civic responsibility);
- **Cognitive-methodological components** (knowledge and teaching skills);
- **Activity-based components** (practical pedagogical experience);
- **Reflective-creative components** (self-assessment, innovation, creativity).

### Methodology

The study used a **mixed-method approach** combining theoretical modeling, expert evaluation, and experimental verification.

### Research stages

1. **Diagnostic stage** – assessment of students' initial level of professional-pedagogical culture.
2. **Model development stage** – creation of conceptual and structural models.



3. **Experimental stage** – implementation of pedagogical conditions and measurement of outcomes.

*Quantitative model formulation*

The degree of professional-pedagogical culture (PPCdPPC\_dPPCd) can be described by the following equation:

$$PPC_d = \frac{(M_{mot} * 0.3) + (K_{cog} * 0.4) + (A_{act} * 0.2) + (R_{ref} * 0.1)}{1}$$

where:

- $M_{mot}$  — motivational component,
- $K_{cog}$  — cognitive-methodological component,
- $A_{act}$  — activity (practical) component,
- $R_{ref}$  — reflective component.

Each subcomponent was evaluated on a 100-point scale.

**Conceptual and Structural Model**

*Conceptual basis*

The conceptual framework integrates **three pedagogical paradigms**:

- **Activity approach** (A.N. Leontiev) — formation through active practice;
- **Competency approach** (OECD, 2019) — alignment of learning outcomes with competencies;
- **Humanistic approach** (R. Rogers) — emphasis on self-development and creativity.

*Structural model of PPC formation*

| Component     | Content   | Expected Outcome                |
|---------------|---|---------------------------------|
| Motivational  | Interest in the teaching profession, professional values, ethical norms | Stable professional orientation |
| Cognitive     | Knowledge of pedagogy, psychology, methodology of physical education    | Pedagogical literacy            |
| Technological | Mastery of ICT tools, teaching aids, and interactive methods            | Digital competence              |
| Reflective    | Self-assessment, correction of professional behavior                    | Self-improvement ability        |



Schematic representation

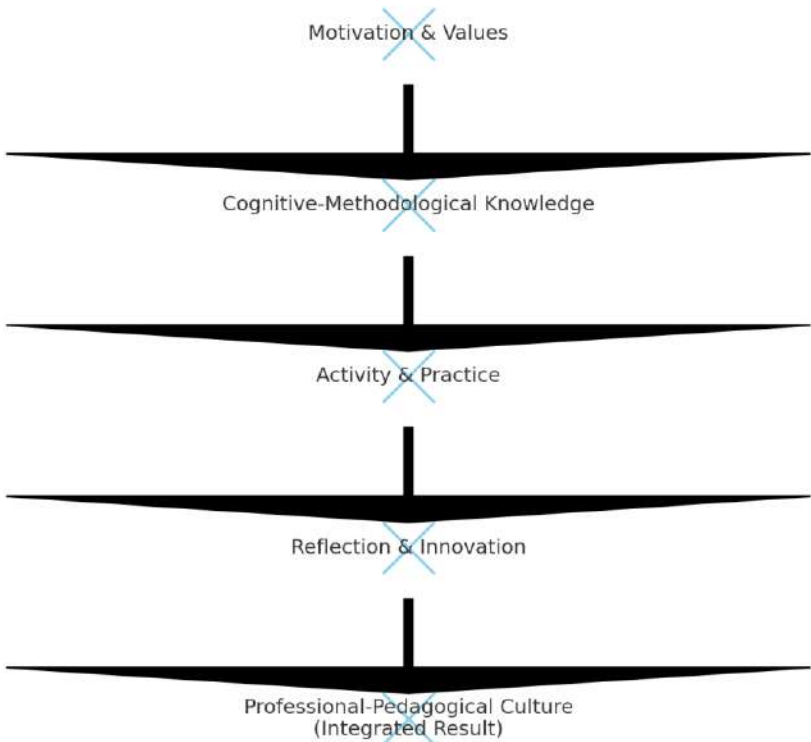


Figure 1. Conceptual-Structural Model of PPC Formation

Results and Discussion

Experimental results (n = 120 students)

| Level of PPC | Initial (%) | Final (%) | Growth (%) |
|--------------|-------------|-----------|------------|
| Low          | 46.0        | 18.5      | -27.5      |
| Medium       | 41.5        | 43.0      | +1.5       |
| High         | 12.5        | 38.5      | +26.0      |

After implementing the model, the number of students with **high-level PPC** increased threefold. Statistical verification using the *Student's t-test* yielded  $t_{exp}=3.87>t_{crit}=2.01$  ( $p < 0.05$ ), confirming the **effectiveness of the model**.

Conclusion

1. The conceptual-structural model of PPC integrates motivational, cognitive, technological, and reflective components, ensuring holistic teacher development.
2. The model improves the quality of professional training for PE students by emphasizing self-reflection and competence-based learning.
3. The experimental data demonstrate significant improvement (average +26%) in PPC levels after applying the model.
4. Future studies should focus on the integration of **AI-based learning analytics** to dynamically assess PPC in digital learning environments.





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