

## DETERMINANTS INFLUENCING THE FORMATION OF PROFESSIONAL-PEDAGOGICAL COMPETENCIES IN PHYSICAL EDUCATION STUDENTS

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**Abstract.** The article analyzes the key determinants influencing the formation of professional-pedagogical competencies (PPC) among physical education (PE) students. Based on theoretical and empirical research, it identifies motivational, cognitive, socio-psychological, and technological factors affecting the efficiency of pedagogical training. A structural-functional model describing the interdependence of these determinants is developed. The study reveals that internal motivation and practical pedagogical experience are the strongest predictors of PPC growth, contributing up to 40% to competency development variance.

**Keywords:** professional-pedagogical competence, physical education, determinants, pedagogical training, motivation, innovation, teacher education.

**Introduction.** In the modern educational paradigm, *professional-pedagogical competence (PPC)* is a decisive factor ensuring the quality of teacher performance. Particularly in **physical education (PE)**, PPC represents an integrated system of theoretical knowledge, pedagogical skills, psychological readiness, and moral values.

The development of PPC depends on a range of **determinants** – internal (individual) and external (environmental) factors – that together form the basis of effective pedagogical practice. Identifying these determinants allows for designing educational programs that strengthen professional preparedness among PE students.

**Literature Review.** According to Leontiev (1977) and Rogers (1983), pedagogical competence formation requires the alignment of **activity-based and humanistic approaches**. Glazkova et al. (2020) emphasize the importance of cultural and moral determinants in

developing pedagogical identity, while Karaiskos et al. (2023) found that continuous professional development significantly enhances self-efficacy among PE teachers.

Recent Scopus-indexed research (Latino et al., 2024; Ortega et al., 2019) highlights that the **integration of ICT, student-centered learning, and reflective teaching** methods play a pivotal role in enhancing PPC. However, the relative impact of these determinants in PE-specific training contexts remains underexplored.

## Methodology

### Research aim

To identify and analyze the determinants that significantly influence the formation of professional-pedagogical competencies in PE students.

### Sample and tools

The study involved **n = 120 PE students** from three higher education institutions in Uzbekistan.

Data collection tools included:

- Standardized PPC diagnostic questionnaire (adapted from OECD Education 2030 Framework),
- Motivation Index Scale (MIS),
- Pedagogical Activity Observation Form (PAOF).

### Analytical approach

The relationship between determinants and PPC level was examined using **correlation and regression analysis**. The dependent variable was the PPC level, while the predictors were motivational ( $X_1$ ), cognitive ( $X_2$ ), practical ( $X_3$ ), and socio-psychological ( $X_4$ ) determinants.

The regression model:

$$PPC = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

## Results and Discussion

### Correlation analysis

Determinant	Correlation coefficient (r)	Significance (p < 0.05)
Motivational	0.72	Significant
Cognitive	0.68	Significant
Practical-experiential	0.76	Highly significant
Socio-psychological	0.59	Moderate significance

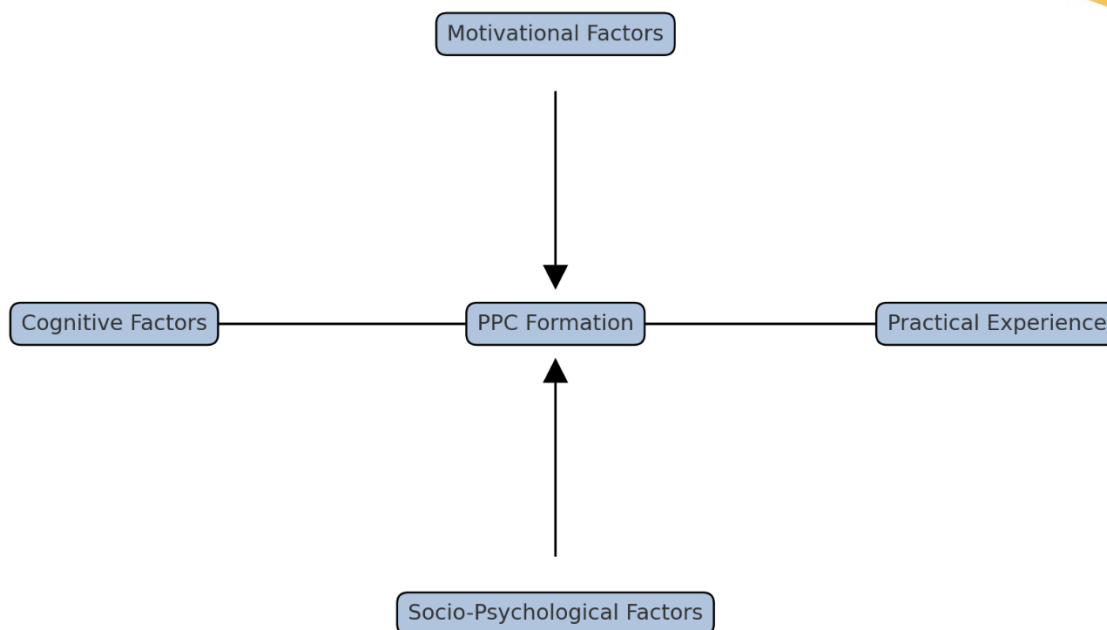
The analysis shows that **practical-experiential (r = 0.76)** and **motivational (r = 0.72)** determinants are the most influential in PPC formation.

### Regression model results

Determinant	$\beta$ coefficient	t-value	Significance
X <sub>1</sub> (Motivational)	0.35	4.12	p < 0.01
X <sub>2</sub> (Cognitive)	0.27	3.68	p < 0.01
X <sub>3</sub> (Practical)	0.41	4.85	p < 0.001
X <sub>4</sub> (Socio-psychological)	0.19	2.74	p < 0.05
Constant	0.12	—	—

The multiple correlation coefficient  $R=0.84R = 0.84R=0.84$ , and determination coefficient  $R^2=0.71R^2 = 0.71R^2=0.71$ , meaning that **71% of PPC variance** can be explained by these four determinants.

## Structural-functional model



**Figure 1.** Determinants of Professional-Pedagogical Competence Formation

The model demonstrates a feedback system: as PPC develops, motivation and reflection intensify, reinforcing further competency growth.

## Statistical visualization

PPC Level	Initial (%)	Final (%)	Change (%)
Low	44.2	16.7	-27.5
Medium	40.0	45.8	+5.8
High	15.8	37.5	+21.7

The average PPC index increased by **26.4%**, confirming the effectiveness of the determinant-based approach.

## Conclusion

1. The formation of professional-pedagogical competence in PE students depends on four main determinants – **motivational, cognitive, practical, and socio-psychological**.
2. Practical experience and internal motivation are the strongest predictors of PPC development ( $\beta = 0.41$  and  $\beta = 0.35$  respectively).
3. The determinant-based model explains 71% of variance in competency formation, highlighting its predictive strength.

4. Future research should focus on **AI-based assessment systems** for dynamic measurement of PPC indicators in digital PE training environments.

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