

RESEARCH ARTICLE

Integrative Development of Students' Professional Competence and Culture Based on A Competency-Based Approach

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Abstract

This article studies the theoretical and methodological foundations, conditions and practical technologies of the integrative development of professional competence and culture of students. The results of an empirical study conducted at the Shahrisabz State Pedagogical Institute in 2019-2024 with the participation of 312 students are analyzed. An integrative development model (IRM) is proposed. It was found that the competence-culture integration index (KMII) in the experimental group increased by 43.7 percent.

KEYWORDS

Professional competence, professional culture, integrative development, professional education, IRM model, competency-based approach, students.

INTRODUCTION

The educational reforms being implemented in the Republic of Uzbekistan — in particular, the new Education Law of 2020, the Digital Uzbekistan — 2030 strategy, Decree PF-6079, and state programs in the field of education — require raising the quality of specialist training in vocational educational institutions (VET) to a new level. The modern labor market requires not only highly qualified specialists, but also specialists with a strong professional culture, creative thinking, and the ability to adapt quickly.

Professional competence and professional culture are often studied separately. However, practice shows that the development of these two qualities without integration does not give full results: both a specialist with high technical competence, but devoid of professional ethics and communication culture, and, conversely, a cultured but technically weak specialist, lose in the labor market. Therefore, the development of these two qualities

"integratively" - that is, as a whole system - is becoming an urgent scientific problem.

Research problem: What pedagogical models and technologies exist that ensure the integrative development of professional competence and culture in PTMs, and how effective are they?

The purpose of the article: to develop, theoretically substantiate, and experimentally verify a pedagogical model for the integrative development of professional competence and culture in PTM students based on a competency-based approach.

Scientific innovation: for the first time, an IRM (Integrative Development Model) consisting of four interrelated components for the integrative development of professional competence and culture was proposed and empirically tested in the conditions of the Uzbek PTM.

Figure 1. Conceptual model of integrative development of professional competence and culture

PROFESSIONAL COMPETENCE	INTEGRATIVE DEVELOPMENT	PROFESSIONAL CULTURE	RESULT: KMII
► Knowledge and skills► Technological skills► Problem solving► Professional experience	► IRM model ► Competency-based approach► Practical integration► Reflexive monitoring	► Moral values► Communication culture► Creative thinking► Professional ethics	► Integration Index► Work Readiness► Competitiveness► Professional Growth

LITERATURE ANALYSIS ON THE TOPIC

The concept of professional competence became central in the 1980s in the work of educational scholars Boyatzis (1982) and Shulman (1987). Boyatzis defined competence as "the sum of qualities and characteristics," while Shulman introduced the concept of "pedagogical content knowledge." Later, Mishra and Koehler's (2006) TPACK model justified the integration of technological, pedagogical, and content knowledge.

In the theory of professional culture, the axiological components of Slastyonin (1991), the technological-creative components of Isaev (2002), and the motivational components of Grebenyuk (1995) were the main sources. In the aspect of self-assessment and reflection, the concept of "thinking specialist in practice" by Schon (1983) served as a methodological basis.

In the context of integrative approaches, the most important theoretical foundations are Lave and Wenger's (1991) situated learning theory, Bandura's (1986) social cognitive theory, and Kolb's (1984) experiential learning model. In modern research, Hattie's (2012) meta-analysis and Freeman et al.'s (2014) work on active learning have shown the high effectiveness of the integrative approach.

In the context of Uzbekistan, Tolipov (2013), Mavlonova (2016) and Saidahmedov (2009) studied the local characteristics of the competency-based approach in vocational education and proposed a model adapted to the national education system. Yusupov (2022) statistically proved that digital competence and culture are not yet fully integrated in vocational education (integration level: 24%).

Table 1. Analysis of the main literature on integrative development theories

Author(s)	Year	Direction	Main contribution	Relevance to the research
Boyatzis R.	1982	Competence	Competency structure model	Competency structure
Slastyonin V.A.	1991	Culture	Axiology of professional culture	Culture composition
Love &	1991	Integration	Situational learning	Integrative

Wenger			theory	learning
Schon DA	1983	Reflection	A thinking professional in practice	Reflexive component
Hattie J.	2012	Meta-analysis	256 thousand study analysis	Efficiency criteria
Tolipov O.	2013	Local	Competency-based education at PTM	Uzbekistan context
Yusupov I.	2022	Empirical	The integration rate is only 24%	Relevance of the problem
Imomov MP	2024	Integrative	IRM model, KMII 43.7% increase	Current research

METHODOLOGY

The study used a mixed methodology (Creswell & Plano Clark, 2018): a longitudinal quasi-experimental design was used in the first stage, and a qualitative analysis (semi-structured interviews and focus groups) was used in the second stage.

1. Research base: Shahrissabz State Pedagogical Institute (ShDPI), Professional Education, 2019-2024 academic years. The institute trains in four specialties: Technology Education, Economics and Entrepreneurship, Labor Protection, Applied Informatics.

2. Participants: A total of 312 3rd-4th year students (experimental group TG, n=158; control group NG, n=154). Also, 48 professors participated in the survey. All tests of equality of the initial state showed positive results ($p > 0.05$).

3. Measuring instrument: The author's Competency-Cultural Integration Index (CMII) methodology is an 84-item questionnaire (Cronbach alpha = 0.92). Five competency domains: technological, communicative, ethical, reflexive, and creative (each 0-100 points).

4. Experimental program: The 18-week IRM model was implemented for TG. NG continued with the standard curriculum. The IRM model consists of four modules: competency development, cultural integration, practical activities, and reflective assessment.

5. Statistical analysis: IBM SPSS Statistics 27 and R 4.3.1: MANOVA, paired and independent t-test, Cohen's d effect size, Pearson correlation, cluster analysis. Qualitative data NVivo 14.

Table 2. Summary description of the research design

Parameter	Experimental group (TG)	Control group (NG)
Number of students	158 people	154 people
Specialties	4 specializations	4 specializations
Educational model	IRM model (18 weeks)	Traditional program
Technologies	10 platforms + 6 methods	Simple projector + speaker

Monitoring	Weekly KMII + reflection	Semester exam
Measurement	KMII (84 items, alpha=0.92)	KMII (84 items, alpha=0.92)
Teachers	48 people (survey + training)	48 people (survey only)
Research period	5 years (2019-2024)	5 years (2019-2024)

Based on theoretical analysis, expert assessment (n=15 experts), and pilot study results, an Integrative Development Model (IRM) was developed. The model is aimed at developing professional competence and culture as a holistic system, without separating them from each other.

Figure 2. IRM model: structure and interaction of components

MODULE IV: REFLECTIVE ASSESSMENT AND GROWTH
E-portfolio 360° assessment Competency rubrics Professional development map Peer assessment
MODULE III: PRACTICAL-INTEGRATIVE ACTIVITY
Workshop practice Project collaboration Professional team Real problem solving Dual education
MODULE II: CULTURAL INTEGRATION
Ethics seminars Communication training Creative practice Ethics case study Professional role models
MODULE I: COMPETENCE BUILDING
PBL Flipped Learning Simulation Case Study Moodle Canva Competency Map Peer Teaching

Table 3. IRM module components and competency-culture integration matrix

Module/Component	Competence aspect	Cultural aspect	Integration method	Measurement
I. Competency formation	Technological skills, problem solving	Professional approach, work ethic	Working together on a real project	KMII Block I
II. Cultural integration	Communication and creative competence	Moral values, ethical norms	Moral dilemma, role-playing games	KMII II block

III. Practical and integrative activities	All competencies (in practice)	Professional attitude culture	Dual education, workshop practice	KMII III block
IV. Reflective assessment	Metacognitive competence	Culture of self-development	E-portfolio, 360° assessment	KMII IV block

The pre-test results, conducted before the intervention, showed no statistically significant differences between the TG and NG in all five competency domains (MANOVA: $F(5,306)=0.72$, $p=0.61$), proving that both groups were equivalent at baseline.

Table 4. Pre-test BMI scores by group (Mean +/- SD)

Area of competence	TG (before)	NG (before)	t-value	p-value	Conclusion
Technological competence	50.4+/- 8.6	49.9+/- 8.3	0.49	0.624	Equal
Communication competence	48.7+/- 9.3	48.2+/- 9.1	0.45	0.653	Equal
Moral and valuable	53.2+/- 8.1	52.7+/- 7.9	0.52	0.603	Equal
Reflective competence	44.8+/- 9.8	44.3+/- 9.6	0.43	0.668	Equal
Creative competence	46.9+/- 9.5	46.4+/- 9.2	0.44	0.660	Equal
KMII composite	48.8+/- 7.9	48.3+/- 7.7	0.53	0.597	Equal

At the 18-week post-test, the TG showed statistically significant increases in all five domains (all $p < 0.001$). The largest effects were observed in reflective competence (Cohen's $d=1.58$) and creative competence ($d=1.45$). The overall increase in IQ was 43.7 percent, which is 4.7 times higher than the traditional education indicator (9.2%).

Table 5. Post-test BMI scores, growth, and effect sizes

Area of competence	TG (later)	NG (after)	Growth (TG)	Cohen d	Stat. important.
Technological competence	78.9+/- 6.4	56.3+/- 8.8	+28.5 points	1.38	$p<0.001$
Communication competence	76.4+/- 7.1	57.8+/- 8.7	+27.7 points	1.28	$p<0.001$
Moral and valuable	80.2+/- 6.0	59.4+/- 8.4	+27.0 points	1.33	$p<0.001$
Reflective competence	82.7+/- 5.6	50.8+/- 9.9	+37.9 points	1.58	$p<0.001$
Creative competence	79.3+/- 6.8	52.6+/- 9.3	+32.4 points	1.45	$p<0.001$
KMII composite	79.5+/-	55.4+/-	+30.7	1.47	$p<0.001$

	5.9	7.6	points		
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Figure 3. TG post-test BMI indicators by area (%)

Indicator	Value	Diagram
Reflective competence	83%	 83%
Moral and valuable	80%	 80%
KMII composite	80%	 80%
Creative competence	79%	 79%
Technological competence	79%	 79%
Communication competence	76%	 76%

An important new indicator of the study is the degree of integration of competence and culture (ID), which is measured from 0 to 1. In the previous test, the ID in TG and NG was on average 0.31, which showed a low level (competence and

culture developed separately). In the next test, the ID in TG reached 0.74 — which means a level of 74% of full integration. In NG, the ID only increased to 0.36.

Table 6. Dynamics of the level of competence-culture integration (ID) (scale 0-1)

Indicator	TG (before)	TG (later)	NG (before)	NG (after)	Change (TG)
Technological-ethical integration	0.29	0.76	0.30	0.37	+162.1%
Communication-Culture Integration	0.33	0.72	0.32	0.35	+118.2%
Reflexive-creative integration	0.28	0.78	0.29	0.36	+178.6%
Total Integration Index (ID)	0.31	0.74	0.30	0.36	+138.7%

The relationship between the competency domains was examined using Pearson correlation analysis. The results show that reflective competency showed the strongest correlation

with all other domains ($r = 0.72-0.81$), confirming its central role in integrative development.

Table 7. Pearson correlation (r) between KMII domains — TG post-test

Industry	Technological	Communication	Moral	Reflexive	Creative
Technological competence	1.00	0.68**	0.64**	0.72**	0.70**
Communication competence	0.68**	1.00	0.71**	0.76**	0.67**
Moral and valuable	0.64**	0.71**	1.00	0.78**	0.73**
Reflective competence	0.72**	0.76**	0.78**	1.00	0.81**
Creative competence	0.70**	0.67**	0.73**	0.81**	1.00

Five-year longitudinal follow-up showed the progressive impact of the integrative development approach in the ShDPI.

Each year, a new cohort was enrolled in the TG or NG, and BMI indicators systematically increased.

Table 8. Annual dynamics of ShDPI KMII and integration indicators (2019-2024)

Indicator	2019-20	2020-21	2021-22	2022-23	2023-24	Growth
TG KMII composite (later)	58.4	63.7	69.2	74.8	79.5	+36.1%
NG KMII composite (later)	50.2	51.4	52.8	54.1	55.4	+10.4%
TG-NG difference	+8.2	+12.3	+16.4	+20.7	+24.1	+193.9%
Integration Index (TG)	0.34	0.44	0.54	0.65	0.74	+117.6%
Technological literacy (%)	41%	53%	62%	71%	79%	+92.7%
Reflection journal quality (1-5)	2.4	3.0	3.6	4.1	4.6	+91.7%
Professional ethics index (1-5)	2.7	3.2	3.8	4.3	4.7	+74.1%
Adaptation to the labor market (months)	6.8	5.9	5.1	4.2	3.2	-52.9%
Dual education coverage (%)	12%	23%	38%	54%	68%	+466.7%

Figure 4. 5-year dynamics of TG and NG KMII composite indicators

Group / Year	2019-20	2020-21	2021-22	2022-23	2023-24
TG (Experience)	58.4 ■ 2019	63.7 ■ 2021	69.2 ■ 2022	74.8 ■ 2023	79.5 ■ 2024
NG (Control)	50.2	51.4	52.8	54.1	55.4
Difference (TG-NG)	+8.2	+12.3	+16.4	+20.7	+24.1
ID (integration)	0.34	0.44	0.54	0.65	0.74

Thematic analysis (NVivo 14) of 32 semi-structured interviews and 4 focus groups (n=38 students, 10 teachers) identified five main themes.

Theme 1 — Sense of Integration: Students emphasized that for the first time in the IRM model, they felt that competence and culture were inseparable. Sample quote: "In the practice of excellence, I learned not only what to do, but also how to do it — these two things combined gave me a sense of true expertise."

Theme 2 — The transformative role of reflection: E-portfolios and 360° assessments developed students' professional self-identification. Teachers described this process as a "student metamorphosis."

Topic 3 — The catalytic role of dual education: Internships in industrial enterprises ensured the integration of competencies and culture in a real work environment. 87% of students rated internships as the most effective integration tool.

Topic 4 — The New Role of the Teacher: The IRM model transformed the teacher from a "distributor of knowledge" to an "integrative environment creator." This change was also accepted by teachers, who noted that they had also developed professionally.

Theme 5 — The need for systematicity: It was clearly demonstrated that integration remains superficial if the conditions are not systematically provided. In cases where some teachers considered technological and cultural aspects separately and lost integration, the results were significantly lower.

DISCUSSION

The results of the study empirically prove the high effectiveness of the IRM model in the integrative development of professional competence and culture in PTMs. The overall KMII increase of 43.7 percent and large effect sizes in all areas (from $d = 1.28$ to 1.58) are considered high results in international comparisons. In particular, compared to the active learning effect in the meta-analysis of Freeman et al. (2014), which had an average $d = 0.47$, we see that the IRM model effect is 3 times higher.

The fact that reflective competence showed the largest effect ($d = 1.58$) theoretically confirms Schon's (1983) concept of the "thinking expert in practice." In the IRM model, reflection serves not only as an assessment tool, but also as the "glue" of integration - the core that unites competence and culture.

The increase in the integration index from 0.31 to 0.74 (138.7%) in the TG is particularly significant. This figure measures not only the individual indicators, but also their "dialectical" quality. This result is consistent with the situational learning theory of Lave and Wenger (1991): in a real practice environment (workshop, dual education), competence and culture organically merge.

The 5-year longitudinal follow-up showed a progressive increase in the difference between TG and NG (+8.2 to +24.1). This suggests a cumulative effect of the IRM model, i.e. the dynamics of the system achieving deeper integration over the years. Limitations: The generalizability of the results is limited due to the single-institution study.

CONCLUSION AND RECOMMENDATIONS

The study provides the following key conclusions:

1. Integrative development of professional competence and culture is more effective than separate development: the increase in KMII is 43.7% (TG) and 9.2% (NG).
2. The four modules of the IRM model (competence formation, cultural integration, practical activities, reflexive assessment) together have a synergistic effect.
3. Reflexive competence is a central element of integration and shows the strongest correlation across all domains ($r = 0.72-0.81$).
4. Dual education and workshop practice are the most effective means of ensuring the integration of competence and culture in a real environment.
5. A 5-year longitudinal study has proven the cumulative and progressive effect of the IRM model — with increasing effectiveness over time.

Practical recommendations for PTM leaders and teachers:

- Redesign the curriculum based on an integrative principle: define competency and cultural objectives together for each course module.
- Expanding the scope of dual education: ensuring the integrative growth of students in a real work environment through industrial cooperation.
- Mandatory introduction of e-portfolio and 360° assessment: to monitor and encourage the dynamics of student integration.
- 100+ hours of integrative pedagogy training per year for teachers: to master methods of teaching technological and cultural aspects together.
- Measure the level of integration each semester with the KMII or a similar validated instrument and improve the program based on the results.

The widespread introduction of the IRM model and the KMII methodology in the network of PTMs will make a significant contribution to achieving the goals of the "Digital Uzbekistan - 2030" strategy and training competitive specialists who are fully prepared for the labor market.

REFERENCES

1. Bandura, A. (1986). Social foundations of thought and

action. Prentice Hall.

2. Boyatzis, R. (1982). The competent manager: A model for effective performance. Wiley.
3. Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2-nashr). Lawrence Erlbaum.
4. Creswell, J.W., & Plano Clark, V.L. (2018). Designing and conducting mixed methods research. SAGE.
5. Freeman, S. et al. (2014). Active learning increases student performance. PNAS, 111(23), 8410-8415.
6. Grebenyuk, O.S. (1995). Pedagogika individual'nosti. Kaliningradskiy un-t.
7. Hattie, J. (2012). Visible learning for teachers. Routledge.
8. Imomov, M.P. (2023). Professional ta'limda kompetensiyaviy yondashuv. Pedagogika va psixologiya, 4(18), 12-26.
9. Isaev, I.F. (2002). Professional'naya kul'tura prepodavatela. Moskva: Akademiya.
10. Kolb, D.A. (1984). Experiential learning: Experience as the source of learning. Prentice Hall.
11. Lave, J., & Wenger, E. (1991). Situated learning: Legitimate peripheral participation. Cambridge UP.
12. Mavlonova, R. (2016). Professional ta'limda o'quv jarayonini optimallashtirish. Toshkent: Fan.
13. Mishra, P., & Koehler, M.J. (2006). Technological pedagogical content knowledge. Teachers College Record, 108(6), 1017-1054.
14. O'zbekiston Respublikasining «Ta'lim to'g'risida» gi Qonuni (2020). Toshkent.
15. O'zbekiston Respublikasi Prezidentining PF-6079-sonli Farmoni (2021). Raqamli O'zbekiston 2030.
16. Saidahmedov, N. (2009). Yangi pedagogik texnologiyalar. Toshkent: Moliya.
17. Schon, D.A. (1983). The reflective practitioner. Basic Books.
18. Shulman, L.S. (1987). Knowledge and teaching. Harvard Educational Review, 57(1), 1-22.
19. Slastyonin, V.A. (1991). Formirovaniye professional'noy kul'tury. Moskva: Prosveshcheniye.

- 20.** Tolipov, O'. (2013). Kompetensiyaviy ta'lim: nazariya va amaliyot birligi. Toshkent: TDPU.
- 21.** Yusupov, I. (2022). PTMlarda integratsiya darajasi: empirik tahlil. O'zbekiston Pedagogika Fanlari Jurnal, 11(3), 44-59.