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FORMING GENDER COMPETENCE IN FUTURE PHYSICAL EDUCATION TEACHERS BASED ON AN INTEGRATIVE APPROACH

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Forming gender competence in future physical education teachers based on an integrative approach

Abstract. This article explores the challenges and future directions of developing gender competence in prospective physical education teachers through interdisciplinary integration. The relevance of the study is driven by the transformation of gender role perceptions in contemporary society, as well as by modern pedagogical demands for equal educational opportunities and the creation of an inclusive, humanistic learning environment within the Kazakhstani education system. The research focuses on identifying effective ways to form gender competence in future specialists using an integrative approach. The study addresses three key areas: theoretical clarification of the structure and components of gender competence in physical education, empirical assessment of its formation level, and the design and evaluation of pedagogical conditions and technologies that enhance its development. A three-stage model of gender competence formation is proposed, including informational-analytical, practice-oriented, and reflective-concluding stages. Experimental results, obtained through diagnostic tools and statistical analysis using Student's t-test, confirm the superiority of the integrative approach over traditional training methods. The study's significance lies in synthesizing national and international research and offering practical recommendations to improve teacher training quality.

Key words: gender competence, integrative approach, future physical education teachers, professional training, traditional education.

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Интегративтік тәсіл негізінде болашақ дене шынықтыру мұғалімдерінің гендерлік құзыреттілігін қалыптастыру

Аңдатпа. Бұл мақала пәнаралық ықпалдастыру қағидаттарына сүйене отырып, болашақ дене шынықтыру мұғалімдерінің гендерлік құзыреттілігін қалыптастырудың өзекті мәселелері мен даму перспективаларын талдауға арналған. Зерттеудің маңыздылығы қазіргі қоғамда гендерлік рөлдер туралы түсініктердің өзгеруімен, сондай-ақ білім беру үдерісінде тең мүмкіндіктерді қамтамасыз етуге бағытталған заманауи педагогикалық талаптармен және Қазақстанның білім беру жүйесінде гендерлік кемсітусіз, инклюзивті әрі гуманистік орта қалыптастыру ұмтылысымен айқындалады. Зерттеудің негізгі мақсаты – интегративті тәсіл негізінде болашақ мамандардың гендерлік құзыреттілігін тиімді қалыптастыру жолдарын айқындау. Жұмыста гендерлік құзыреттіліктің құрылымы мен компоненттерін теориялық тұрғыда негіздеу, оның қалыптасу деңгейін эмпирикалық бағалау, сондай-ақ педагогикалық жағдайлар мен технологиялардың тиімділігін анықтау қарастырылған. Гендерлік құзыреттілікті қалыптастырудың ақпараттық-талдамалық, практикалық-бағдарлы және рефлексиялық-қорытынды кезеңдерден тұратын үлгісі ұсынылады. Эксперименттік деректер мен Студенттің t-критерийі негізіндегі статистикалық талдау интегративті тәсілдің дәстүрлі оқытуға қарағанда тиімді екенін дәлелдеді. Зерттеу нәтижелері болашақ мұғалімдерді даярлау сапасын арттыруға және едістемелік ұсынымдарды жетілдіруге мүмкіндік береді.

Түйін сөздер: гендерлік құзыреттілік, интеграциялық тәсіл, болашақ дене шынықтыру мұғалімдері, кәсіби даярлық, дәстүрлі білім беру.

Сирлибаев Медет Кошербаевич, Матаев Берик Айтбаевич, Серхат Арслан

Формирование гендерной компетентности будущих учителей физической культуры на основе интегративного подхода

Аннотация. В статье рассматриваются актуальные проблемы и перспективы формирования гендерной компетентности у будущих учителей физической культуры на основе междисциплинарной интеграции. Актуальность исследования обусловлена трансформацией представлений о гендерных ролях в современном обществе, а также требованиями современной педагогики к обеспечению равных образовательных возможностей и созданию инклюзивной, гуманистически ориентированной образовательной среды в системе образования Республики Казахстан. Основное внимание уделяется выявлению эффективных путей и механизмов развития гендерной компетентности у будущих специалистов с использованием интегративного подхода. В рамках исследования уточняется структура и содержание гендерной компетентности в контексте педагогики физического воспитания, проводится диагностика уровня её сформированности, а также разрабатываются и апробируются педагогические условия и технологии, способствующие

её целенаправленному развитию. Предложена модель формирования гендерной компетентности, включающая информационно-аналитический, практико-ориентированный и рефлексивно-обобщающий этапы. Экспериментальные данные, подтверждённые статистическим анализом с применением *t*-критерия Стьюдента, свидетельствуют о более высокой эффективности интегративного подхода по сравнению с традиционными методами обучения.

Ключевые слова: гендерная компетентность, интеграционный подход, будущие учителя физической культуры, профессиональная подготовка, традиционное образование.

Introduction. In recent years, the modern education system in Kazakhstan has increasingly faced the need to revise traditional approaches to teaching and upbringing. This is particularly noticeable in those areas of education where certain stereotypes have a significant impact on students' perceptions. Physical education is one such area. This approach is due to the fact that physical education has long remained an area that has not been subject to scientific interest in the physical capabilities and social roles of representatives of different genders. At the same time, physical education is characterized by certain strict attitudes based on gender.

The relevance of the problem expressed in the formation of gender competence in future physical education teachers is due to a number of factors, primarily the change in the perception of gender roles in modern society. Secondly, there are new requirements arising from modern pedagogy to ensure equal opportunities for all students regardless of their gender. Thirdly, it depends on the desire of the Kazakhstani education system to create an inclusive environment based on humanism and free from any discriminatory attitudes, including gender discrimination.

Research interest in this area is driven by the insufficient development of mechanisms for forming gender competence in the professional training of future physical education teachers in Kazakhstan. Currently, there are many studies devoted to general aspects of gender competence in pedagogy. However, the specificity of physical education as a discipline with a pronounced physical component and, therefore, a strong connection with gender stereotypes is not covered by such studies. Based on this, a separate consideration and development of specific gender approaches in the teaching of physical education is required. One of the promising directions in this context is an integrative approach. This is because the principles of integrativity allow for the combination of knowledge from various fields of science (psychology, pedagogy, sociology, and others). Interactivity makes it possible to create a more comprehensive system for training future physical education teachers. Provided that such a system can prepare professionals who will have the necessary knowledge and qualities needed to interact effectively with students of any gender.

Analyzing current trends in the development of gender education in the Republic of Kazakhstan, we can note the significant efforts of the state and the scientific community aimed at promoting the principles of gender equality and inclusiveness. These include legislative acts in the field of inclusive education. However, serious obstacles remain, among which the following should be highlighted: a lack of specialized educational and methodological literature; the importance of adapting existing methodologies to the new conditions of the educational space; the absence of promising practices; and the need for preliminary experiments. All this points to the need for further research in this area and the development of practical recommendations that will allow us to more effectively solve existing problems and achieve our goals.

Research objective: to study the possibilities and ways of forming gender competence in future physical education teachers through an integrative approach.

Main objectives:

- 1) theoretical identification of the main components of gender competence in physical education pedagogy and the characteristics of the integrative approach;
- 2) experimental determination of the level of gender competence of future physical education teachers;
- 3) developing optimal pedagogical integration conditions and technologies for forming more effective gender competence in future physical education teachers;
- 4) evaluating the effectiveness of the proposed approach in the context of professional training for future specialists.

Object: the process of professional training of future physical education teachers in higher education institutions

Subject: the formation of gender competence in future physical education teachers based on an integrative approach.

The scientific novelty of the research consists in the following: an attempt to systematize and summarize the experience of domestic and foreign scientists; the proposal of innovative integrative methods and technologies that can improve the

quality of training physical education teachers in accordance with modern requirements.

The practical significance of the work lies in the possibility of applying the results obtained to improve the educational process in which physical education teachers are trained. It also lies in the preparation of methodological recommendations aimed at developing the gender competence of future specialists in the field of physical education.

Overall, the study has significant scientific and practical results aimed at solving important socio-pedagogical problems in the field of gender and inclusion. It also opens up new prospects for the further development of the Kazakhstani system of training physical education teachers.

Materials and methods. The research methodology is based on the use of a comprehensive scientific approach. It draws on the theoretical and methodological foundations of pedagogy, psychology, andragogy, and gender theory, integrating them with interdisciplinary knowledge used in Kazakhstan's secondary education system. The main methodological principle was the idea of an integrative approach aimed at achieving a more comprehensive understanding of the phenomenon of gender competence by future physical education teachers. In addition, the conditions were taken into account that it is integration that makes it possible, in the process of teaching at a university, to combine scientific knowledge and skills from related disciplines (psychology, sociology, cultural studies, physiology, and others).

The study was organized in several stages.

The first stage involved a theoretical and conceptual analysis of scientific and legislative sources. An in-depth analysis was conducted of domestic and foreign scientific and pedagogical literature covering issues of gender competence in pedagogy, as well as its significance in the professional activities of future physical education teachers. The key components of gender pedagogical competence were identified. The features of an integrative approach that should be used in the process of professional development of future specialists in the field of physical education were revealed.

The literature review was conducted as a narrative synthesis aimed at identifying theoretical foundations and practical approaches to gender competence formation in physical education. Information sources included international databases (Scopus, Web of Science, ERIC, PubMed) and regional repositories (websites of journal from the committee's list, eLibrary.ru, KazNEL), covering

publications from 2015 to 2025. The search strategy employed combinations of keywords: "gender competence," "physical education teachers," "teacher training," "integrative approach," "gender pedagogy," and their equivalents in Russian and Kazakh languages. Boolean operators (AND, OR) were utilized to refine searches across databases.

Selection criteria for inclusion comprised: peer-reviewed journal articles, doctoral dissertations, and official policy documents; studies focusing on gender aspects in physical education or teacher training; publications in English, Russian, or Kazakh; empirical research or theoretical frameworks directly relevant to the study objectives. Exclusion criteria eliminated: publications addressing gender competence outside educational contexts; studies focused solely on student populations without reference to teacher preparation; articles lacking methodological transparency; duplicate publications across databases.

Initial database searches yielded 247 potentially relevant sources. After removing duplicates ($n=63$) and screening titles and abstracts against inclusion criteria, 112 sources underwent full-text review. Of these, 78 sources met all selection criteria and were included in the theoretical analysis. Legislative and regulatory documents ($n=15$) from the Republic of Kazakhstan and international organizations were incorporated separately to establish the policy framework for gender education. The analysis focused on extracting key definitions of gender competence, identifying structural components, and mapping effective pedagogical approaches reported in empirical studies.

At this stage, the following methods were used:

- literature analysis and synthesis of scientific and other literature;
- modeling the structure of gender competence;
- assessment of criteria and indicators of gender competence formation.

The research materials were: scientific sources (monographs, dissertation research, officially published articles, and others on the research topic); legislative and regulatory acts related to the research topic.

At the second stage, which is diagnostic, the initial level of gender competence development was established among second-year students of the Alkey Margulan Pavlodar Pedagogical University studying under the educational program "Physical Culture and Sports" ($N=160$ people). At this stage, specially selected psychological and pedagogical methods were used for diagnosis. All of them are aimed at determining the level of cognitive, motivational, value, and behavioral components

of gender pedagogical competence in the field of physical culture.

The following methods were used:

1) The “Satisfaction with the chosen profession” technique, modified from the techniques of A.A. Rean, V.A. Yadov, and N.V. Kuzmina, was used to establish the motivational component of gender competence in future teachers. The questions considered in the questionnaire make it possible to establish the degree of awareness among students of the importance of taking gender aspects into account in their future profession as physical education teachers. Assessment criteria: low, medium, and high. Low motivation is characterized by not seeing the particular importance of taking gender aspects into account in one's future profession and not planning to develop this competence. Medium motivation is based on the fact that the student is aware of the importance of gender aspects but shows moderate interest in developing them. High motivation is characterized by the fact that the future physical education teacher is actively interested in developing gender competence and intends to apply appropriate approaches in their professional activity.

2) An expert assessment was conducted to determine the operational component of gender competence among students. The questions considered by the experts while observing the students allowed to establish the level of practical skills and abilities of students to take into account the gender characteristics of children in the process of physical education. Criteria: low level (experiences significant difficulties in taking gender characteristics into account, makes frequent mistakes in practical activities); average level (able to take gender characteristics into account, but does so inconsistently and with some mistakes); high level (confidently and consistently takes gender characteristics into account in educational activities, demonstrates high skills and abilities).

3) Knowledge assessment test “Formation and development of gender competence of the individual” proposed by I.S. Kletcin. Within its framework, students were asked questions to determine the informational component of gender competence. They make it possible to establish the level of students' knowledge of gender theories and the possibilities for their application in physical education teaching practice.

The third stage of the study was the experimental-practical stage. Within its framework, a pedagogical experiment was conducted. For this purpose, two groups were created: an experimental group (n=80) and a control group (n=80). It was

aimed at implementing a set of pedagogical measures based on an integrative approach. A special student training program was developed for this purpose. The program included interactive forms of classes, trainings, discussion seminars, analysis of practical cases, project activities, and reflective-analytical technologies.

Research materials: summary tables and protocols; a model and training program for students in the experimental group, compiled taking into account the integrative approach.

The main research method was an experiment using specific project methodology techniques, case studies, group discussions, reflective analysis, and game-based learning techniques.

The main condition of the experiment was that students in the experimental group followed a program based on an integrative approach, while students in the control group were taught using traditional methods. Students were selected at random.

The last, fourth stage was evaluative and analytical. At this stage, the effectiveness of the proposed pedagogical measures used in the experiment was assessed.

The main research methods were:

- comparative analysis of initial and final indicators of gender competence in both groups;
- statistical analysis of the data obtained using Student's t-test;
- qualitative analysis of the dynamics of gender competence indicators.

The methodology used made it possible to cover both the quantitative side of the issue (level of awareness, knowledge) and the qualitative component (attitudes, attitudes, willingness to act within a gender-sensitive paradigm). The application of an integrative approach, using modern interactive and reflective technologies, is aimed at developing experimental gender competence in students. This approach allowed students to gain a deeper understanding of their own position on issues, enabling them to become specialists with the required gender sensitivity.

Results. Results of theoretical research. Gender competence in physical education pedagogy, in the dissertation research of R. Zh. Erofeeva, is defined as a socio-psychological characteristic that a teacher must possess in order to be effective in the system of professional interaction with representatives of both sexes [1].

C. Miralles-Cardona presents it as a combination of professional knowledge, skills, and personal qualities that allow teachers to interact

effectively with students of different genders. This must take into account their unique psychological, physiological, and social characteristics [2].

S. Baena-Morales includes knowledge of the gender approach and the ability to implement it in the pedagogical process. This emphasizes the importance of professional knowledge and skills in working with children [3].

G. Merma-Molina defines it as a personal characteristic that allows teachers to function more effectively in gender relations, based on an anti-discriminatory position [4]. M. Siljamäki interprets it as the ability of a teacher with communication and organizational skills to take into account the individuality of students of both genders and the obligation to create comfortable conditions for everyone [5].

Foreign authors S. Baena-Morales, G. Merma-Molina, and A. Ferriz-Valero define teacher gender competence through the level of competence perceived by children and their enjoyment of physical education classes. At the same time, the authors point out the importance of teachers taking gender differences into account and suggest improving the perception of physical activity among all children who are experiencing a decline in interest in physical exercise [6].

The main components of gender competence for future physical education teachers are defined as: theoretical and methodological component; organizational and activity component; communicative component; ethical and moral component; reflective and analytical component [7].

A.V. Pospelov, according to whom the components of gender competence of future physical education teachers are considered to be informational, motivational, organizational and operational, and reflective [8].

The Constitution of the Republic of Kazakhstan prohibits any discrimination (Article 14), including on the basis of gender, and lays the foundation for building a society based on the principle of equality [9]. In 2009, the Law of the Republic of Kazakhstan “On State Guarantees of Equal Rights and Equal Opportunities for Men and Women” was adopted, which also defines the equality of rights and opportunities for men and women. An important role is played by the Concept of Family and Gender Policy in the Republic of Kazakhstan until 2030, which aims to achieve real gender equality. In addition, Kazakhstan has committed itself to complying with international standards of gender equality enshrined in United Nations conventions. Thus, domestic legislation and international treaties have a significant impact on

the country's domestic policy, including in the field of gender education. Particular attention should be paid to the initiative of the Ministry of Education of the Republic of Kazakhstan aimed at improving the quality of physical education with a gender approach. For example, in 2024, the Ministry of Education, together with UNESCO and the National Olympic Committee of Kazakhstan, organized a series of training seminars for physical education teachers in six cities of Kazakhstan. These events were aimed at both raising the professional standards of physical education teachers and promoting the principles of gender equality and inclusiveness in the physical education curriculum.

The integrative approach in physical education is a methodology aimed at combining various educational disciplines and physical spheres of life in order to ensure the comprehensive and harmonious development of the individual [10]. The integrative approach in the training of future physical education teachers is considered a special teaching technology. It combines elements of various disciplines that are used in the training of professional teachers. It focuses on comprehensive training so that teachers can later use the knowledge and experience they have gained to develop the personality, physical, and intellectual qualities of their students [11].

M. Işıkgöz, using the example of an integrated lesson in physical education and Russian language, demonstrated the high effectiveness of the integrative approach in organizing physical education lessons with primary school children [12].

A. Păuțu emphasizes the importance of an interdisciplinary approach in physical education, noting that the integration of physical education with various school subjects. With physics, physical education through the laws of motion and mechanics and mathematics provides a better understanding of the quantitative indicators of physical activity. History and social studies allow students to see the connection between sport and culture and spiritual traditions. Literature should be included in physical education through the analysis of works of art and poetry that show strength, courage, and the struggle against difficulties. Integration with computer science and modern technologies makes it possible to teach students to analyze their personal results and build assessment graphs based on them [13].

The main features of the integrative approach in the training of future physical education teachers L. García-Rico [14], A.A. Yermekbaev [15], A. Syafi'i, [16], J. Moreira-Choez [17]: a comprehensive approach aimed at the simultaneous development of students' physical, intellectual, and emotional

qualities; increased motivation based on the fact that integration makes lessons more interesting and attractive to students; reduced fatigue, as the alternation of different types of subject activities allows students to maintain high performance throughout the lesson; the development of social skills contributes to the formation of a sense of community, camaraderie, and social mobility;

harmonious personal development based on the formation of a lasting interest in physical activity and a healthy lifestyle, which also leads to an overall improvement in quality of life.

The model for developing optimal pedagogical and integrative conditions and technologies for the formation of gender competence in future physical education teachers is presented in Figure 1.

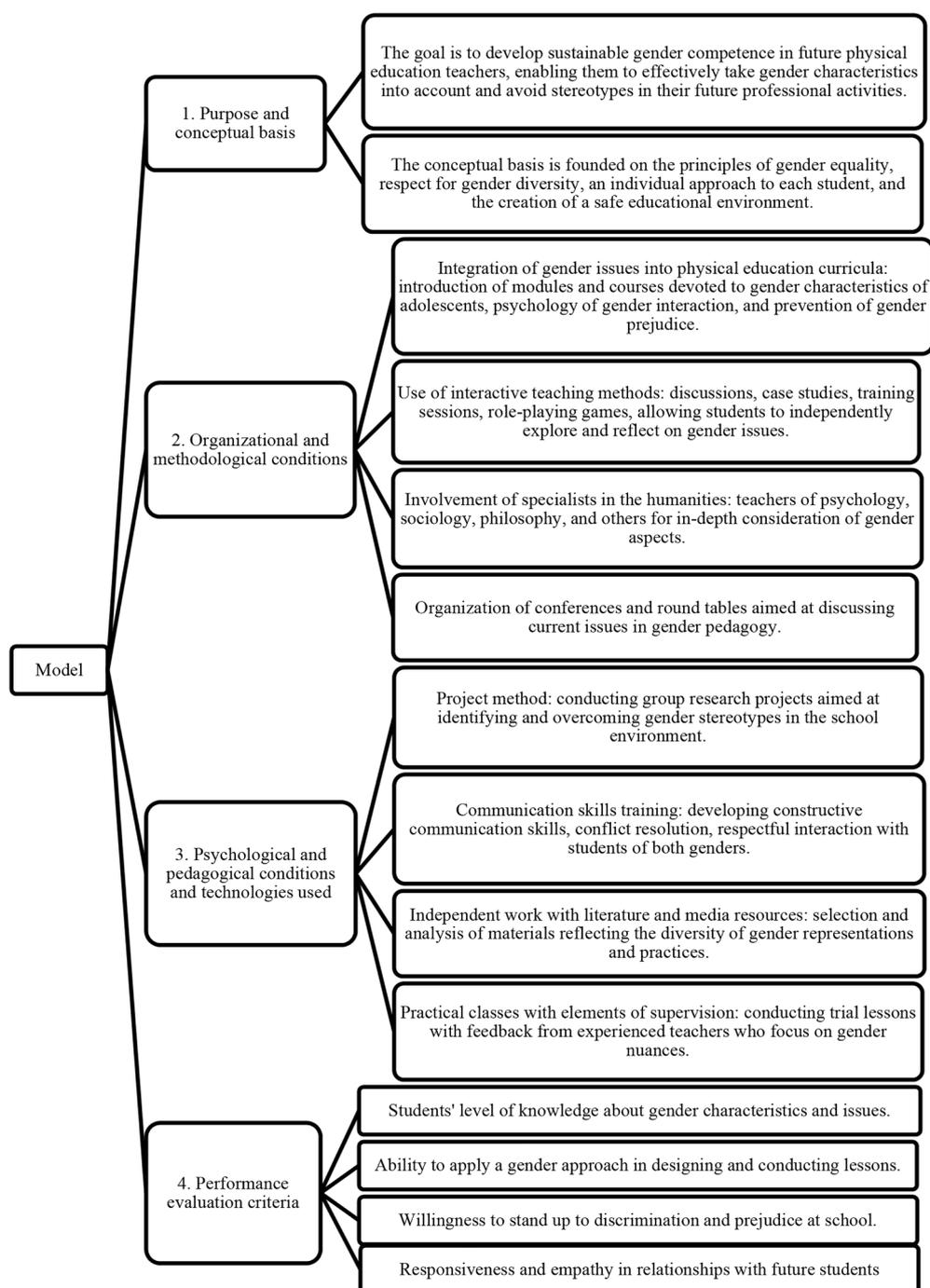


Figure 1 – Model for the formation of gender competence in future physical education teachers, with an integrative approach

A course entitled “Gender approach in the professional activity of a physical education teacher” has been developed to improve the gender competence of future physical education teachers. It is designed for one semester and includes three interrelated stages: informational and analytical, which includes lectures, seminars, and viewing and analysis of films to raise awareness of the importance of the gender approach; practical, using case studies and training sessions to enable students to apply the knowledge they have acquired in practice; reflective and concluding, in the form of project presentations, gender-sensitive lessons, and a final conference. The course content includes special interdisciplinary modules:

1. Gender aspects of health and physical activity – based on combining knowledge from anatomy, physiology, medicine, psychology, and gender pedagogy in physical education. As part of this module, students learn to develop exercise routines that take into account the gender and age characteristics of the body.

2. Psychology of gender interaction in a team – based on integration with subjects such as psychology and team management. Classes are held to practice sports teamwork with social and psychological research and principles of effective management. Integrated classes are aimed at developing students' ability to create a favorable atmosphere of cooperation and respect in sports teams of boys and girls.

3. Designing gender-sensitive physical education lessons is based on integrating theory and practice of physical education teaching methods directly with gender didactics and management. As part of this module, students learn to create practical lesson scenarios that take into account gender differences and similarities. Special lessons

are prepared using elements of physical education and literature, physical education and mathematics.

Thus, all of the proposed modules combine traditional physical education subjects with other subjects.

Joint projects and events became an important indicator of the course's implementation in practice. Team research projects were organized and carried out. To this end, students of the Physical Education and Sports educational program, together with representatives of related faculties (psychologists, teachers), conducted research on the influence of gender attitudes on motivation to participate in sports. They also participated in inter-faculty conferences and forums on gender equality in education and sports. They developed and presented innovative models of integrated physical education lessons. All lesson models created by students were evaluated by specialists in various fields (psychology, pedagogy, management, mathematics, literature, and others).

The main technologies ensuring the integration of future physical education teachers' training were: digital educational platforms combining knowledge from different fields (mainly sports medicine, gender psychology, management); game and simulation technologies that reproduce situations of interaction with students of different genders to develop practical skills for taking gender characteristics into account.

The results of practical research the diagnosis of gender competence of future physical education teachers, using four methods, at the beginning and end of the experiment.

The indicators of the use of the modified knowledge assessment test “Formation and Development of Gender Competence of the Individual” for diagnosing the informational component of gender competence of future physical education teachers are shown in Table 1.

Table 1 – Results of the diagnosis of the informational component of gender competence of future physical education teachers, in percent

Group	Before the experiment			After the experiment			Change (+/-)		
	High	Med	Low	High	Med	Low	High	Med	Low
EG	4	56	40	37	50	13	27	-6	27
KG	4	59	38	10	59	31	6	0	7

At the beginning of the experiment, both groups (experimental and control) were characterized by a fairly equal level of the informational component of

gender competence. Since most students were at an average level (56% in the experimental group and 59% in the control group), a fairly large number had a

low level (40% and 38%, respectively). A high level was represented by a minimal number of students (4% in both groups). These indicators suggest that the informational component of gender competence was insufficiently developed at the initial stage of the study.

By the end of the experiment, the situation had changed significantly. In the experimental group, there was a significant increase in the number of students with a high level (from 3 to 31), or 27%. At the same time, the number of students with a low level decreased (from 39 to 10), also by 27%. The number of students with an average level remained virtually unchanged (from 46 to 40). These changes indicate the effective impact of the integration approach on the formation of the informational component of gender competence.

In the control group, the changes were less pronounced. Although the number of students with a high level also increased (from 3 to 8, or +6%), the majority of students remained at an average level

(unchanged, 47 or 0%). The number of students with a low level increased (from 30 to 25, or 7%). The data obtained indicates the low effectiveness of traditional teaching methods in the context of the formation of the informational component of gender competence.

A comparison of the dynamics of changes between the groups indicates a clear advantage of the integrative approach. The experimental group demonstrated more significant positive results, while the control group showed insignificant positive changes.

To compare the two samples using Student's t-test and confirm the reliability of the comparison of indicators in both groups, the average indicator for each group was first calculated based on the distribution of students by gender competence levels (high, medium, low). The average indicators obtained are reflected in Table 2. This table also shows the results of comparing the two samples using Student's t-test.

Table 2 – Results of calculations using Student's t-test for the information component of gender competence

Measured components	Average indicators		Reliability		
	CG	EG	t-empirical	t-critical ($p \leq 0.05$)	t-critical ($p \leq 0.01$)
Before the experiment	0.67	0.64	-0.78	2.0	2.6
After the experiment	0.79	1.24	20.55	2.0	2.6

Interpretation of results: prior to the experiment, the empirical value of the t-test (-0.78) is far from the critical values (2.0 and 2.6), which indicates that there are no significant differences between the groups at the initial stage. After the experiment, the t-test value (20.55) exceeds the critical values, indicating statistically significant differences

between the experimental and control groups after the experiment.

The results of the diagnostic assessment of the motivational component, conducted using the "Satisfaction with the chosen profession" methodology (modified by A.A. Rean, V.A. Yadov, and N.V. Kuzmina), are presented in Table 3.

Table 3 – Results of the assessment of the level of the motivational component of non-cognitive competence in future physical education teachers, in percent

Group	Before the experiment			After the experiment			Change (+/-)		
	High	Med	Low	High	Med	Low	High	Med	Low
EG	15	50	35	43.8	43.8	12.5	38.3	-12.5	15
KG	12.5	53.7	33.8	18.8	56.2	25	6.7	-2	12.5

At the beginning of the experiment, both groups had similar motivation scores. The majority

of students had average motivation levels (50% in the experimental group and 53.7% in the control

group). A relatively small number of students (15% and 12.5%, respectively) had a high level of motivation, while 35% and 33.8%, respectively, had a low level. This distribution indicates that students were not sufficiently motivated to develop gender competence at the initial stage of the study.

By the end of the experiment, there was a significant improvement in the experimental group. The number of students with a high level of motivation increased to 43.8%, while the number of students with a low level of motivation decreased significantly to 12.5%. These indicators suggest that the measures used increased students' motivation to develop gender competence. Meanwhile, the

changes in the control group were less pronounced: a slight increase in the number of students with high motivation (to 18.75%); the majority of students remained at an average level (53-56%), and an increase in the number of students with low motivation (up to 25%). The data obtained indicates that the traditional approach was unable to ensure a significant increase in the motivation of CG students.

A comparison of the dynamics of changes showed that the experimental group demonstrated a powerful development of the motivational component of gender competence, especially at a high level. The results of the statistical analysis are shown in Table 4.

Table 4 – Results of statistical analysis on the formation of the motivational component of gender competence, according to Student's t-test

Measured components	Average indicators		Reliability		
	CG	EG	t-empirical	t-critical ($p \leq 0.05$)	t-critical ($p \leq 0.01$)
Before the experiment	0.787	0.8	0.14	2.0	2.6
After the experiment	0.938	1.314	10.2	2.0	2.6

Before the experiment, the differences between the groups were statistically insignificant ($t=0.14 < 2.0$). After the experiment, the differences between the experimental and control groups became statistically significant ($t=10.2 > 2.6$), which

also confirms the effectiveness of the integrative approach in terms of motivation.

The results of the expert assessment of the operational component of gender competence among future physical education teachers are shown in Table 5.

Table 5 – Results of the level of the operational component of gender competence among future physical education teachers

Measured components	Average indicators		Reliability		
	CG	EG	t-empirical	t-critical ($p \leq 0.05$)	t-critical ($p \leq 0.01$)
Before the experiment	0.81	0.8	0.2	2	2.6
After the experiment	0.95	1.4	10.6	2	2.6

The empirical value of the t-test before the experiment is 0.24, which is significantly lower than the critical values (2.0 and 2.6). Consequently, the differences between the groups at the initial stage of the study were statistically insignificant, indicating the homogeneity of the samples and the possibility of a fair comparison of subsequent indicators. After the experiment, it reaches 10.6, which significantly exceeds both critical values (2.0 and 2.6). Thus, a statistically significant difference between the

indicators of the experimental and control groups was established after the experimental work. These indicators allow us to conclude that the integrative approach used in the experimental group led to significant and statistically confirmed improvements in the motivational component of gender competence among future physical education teachers. At the same time, the traditional approach used in the control group did not produce any significant positive changes.

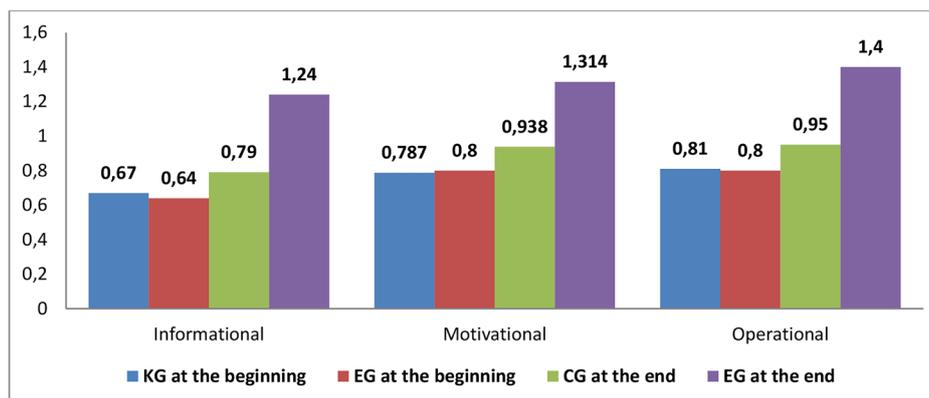


Figure 2 – Dynamics of the average results of gender competence diagnostics of future physical education teachers

The summary average results of the gender competence assessment for the three components are shown in Figure 2.

The indicators established based on the results of the assessment in three areas clearly show a pronounced positive trend in the formation of gender competence among students in the experimental group who underwent training using the integrative approach. At the same time, the greatest improvement was noted in the informational and operational spheres, which indicates the high effectiveness of the integrative approach, the fact that the experiment was conducted recently, and that these indicators are still likely to increase among students.

Discussion. Analysis of the informational component of gender competence showed a significant superiority of the integrative approach over traditional teaching. In the experimental group, the proportion of students with a high level of knowledge increased by 27%, while in the control group, the increase was only 6%. These indicators are consistent with the research of A. Păuțu, who emphasizes the importance of an interdisciplinary approach in physical education, noting that the integration of physical culture with various school subjects contributes to a deeper understanding of the material [13, p. 8]. Statistical analysis using Student's t-test ($t=20.55$ at $p \leq 0.01$) confirms the reliability of the differences between the groups after the experiment, which indicates the scientific validity of the chosen approach.

The dynamics of the motivational component of gender competence deserve special attention. In the experimental group, the number of students with a high level of motivation increased from 15% to 43.8%, which represents an increase of 38.3%. In the control group, the same indicator increased by only 6.7%. These results confirm the position of L.

García-Rico and other researchers that integration makes the educational process more interesting and attractive for students, contributing to an increase in their internal motivation [14, p. 747-765]. The statistical significance of the differences ($t=10.2$ at $p \leq 0.01$) indicates that the integrative approach not only improves students' knowledge but also fosters a lasting desire to develop gender competence and apply appropriate approaches in their future professional activities.

The results of the assessment of the operational component also demonstrated a significant advantage for the experimental group. Statistical analysis ($t=10.6$ at $p \leq 0.01$) confirms that students who studied under the integrative program significantly outperform their peers from the control group in practical skills for taking into account the gender characteristics of students. This is consistent with the position of M. Işıkğöz, who demonstrated the high effectiveness of the integrative approach in the organization of physical education using the example of an integrated lesson [12, p. 10].

A key factor in the success of the developed program was the inclusion of interdisciplinary modules combining knowledge from anatomy, physiology, psychology, sociology, and pedagogy. The module "Gender Aspects of Health and Physical Activity" allowed students to learn how to develop exercise routines that take into account the gender and age characteristics of the body. The module "Psychology of Gender Interaction in a Team" contributed to the formation of the ability to create a favorable atmosphere of cooperation in sports teams. The module "Designing Gender-Sensitive Physical Education Lessons" provided practical training in the skills of creating lessons that take into account gender differences and similarities.

An important aspect of the study was the use of a variety of educational technologies: case studies, training sessions, project-based learning, and reflective-analytical methods. This combination of methods ensured a comprehensive impact on all components of gender competence, as confirmed by the results of the assessment of all three components. This approach is consistent with the conclusions of A.A. Yermekbaev that an integrative approach to the construction of the educational process serves as a condition for the development of students' creative potential [15, p. 233].

The organization of interfaculty cooperation, which included joint projects between students of the Physical Culture and Sports educational program and representatives of psychological and pedagogical specialties, proved to be particularly productive. Students had the opportunity not only to study the theoretical aspects of gender competence, but also to apply the knowledge they had gained in practice by developing innovative models of integrated lessons, which were evaluated by specialists from various fields.

The three-stage structure of the course (informational-analytical, practice-oriented, and reflective-concluding stages) ensured the consistent and systematic development of gender competence. Each stage logically complemented the previous one, which allowed students not only to acquire the necessary knowledge, but also to form sustainable practical skills and a conscious attitude towards gender equality issues in physical education.

The results obtained are important for the system of training physical education teachers in Kazakhstan. They are consistent with the provisions of the Concept of Family and Gender Policy in the Republic of Kazakhstan until 2030 and correspond to the initiatives of the Ministry of Education aimed at improving the quality of physical education with a gender approach. The experience of organizing training seminars for physical education teachers in six cities of Kazakhstan in 2024 confirms the relevance and timeliness of the study.

At the same time, it is necessary to note some limitations of the study. The experiment was conducted at a single pedagogical university, which requires further testing of the developed program in other educational institutions. It should also be noted that the measurements were taken immediately after the completion of the course, and additional longitudinal research is needed to assess the sustainability of the formed gender competence in the long term.

The results of the study open up prospects for further development in this area. It is advisable to

expand interdisciplinary research, bringing together specialists from various fields of academic knowledge. It is necessary to develop new diagnostic tools to assess the level of gender competence among students and graduates of pedagogical universities. It is necessary to study the possibilities of improving state educational standards, taking into account the need to develop gender competence among future physical education teachers.

Thus, the study convincingly proves that an integrative approach is an effective tool for developing the gender competence of future physical education teachers, significantly surpassing traditional teaching methods in all parameters studied.

Conclusion. The research outcomes correspond to the stated objectives and confirm the viability of the integrative approach in developing gender competence among prospective physical education teachers.

Regarding objective 1 (theoretical identification of the main components of gender competence and characteristics of the integrative approach): analysis of scholarly literature and regulatory frameworks revealed that gender competence in physical education pedagogy comprises informational, motivational, and operational components. The integrative approach, characterized by interdisciplinary knowledge synthesis from psychology, sociology, physiology, and pedagogy, creates conditions for comprehensive professional preparation. Theoretical examination established that integration enables future specialists to understand gender aspects not as isolated phenomena but as interconnected elements of pedagogical practice.

Concerning objective 2 (experimental determination of gender competence levels): diagnostic procedures at the initial stage identified insufficient development across all three components among second-year students. Most participants demonstrated average levels in informational (56-59%) and motivational (50-53.7%) components, with substantial proportions exhibiting low levels (38-40% and 33.8-35% respectively). These baseline measurements confirmed the necessity for targeted pedagogical intervention and provided a foundation for comparative analysis.

With respect to objective 3 (developing optimal pedagogical conditions and technologies): a specialized course "Gender approach in the professional activity of a physical education teacher" was designed and implemented, incorporating three sequential stages—informational-analytical, practice-oriented, and reflective-concluding. The program integrated interdisciplinary modules combining anatomi-

cal, physiological, psychological, and pedagogical knowledge with practical case analysis, team projects, and reflective methodologies. Digital platforms and simulation technologies facilitated skill acquisition in gender-sensitive teaching environments.

Addressing objective 4 (evaluating the proposed approach's effectiveness): statistical analysis using Student's t-test demonstrated significant superiority of the integrative method over conventional instruction. In the experimental group, high-level indicators for the informational component increased by 27% ($t=20.55$, $p\leq 0.01$), for the motivational component by 38.3% ($t=10.2$, $p\leq 0.01$), and operational component improvements reached statistical significance ($t=10.6$, $p\leq 0.01$). Control group changes remained minimal (6-7% increases), confirming that traditional methods inadequately address gender competence formation.

The integrative approach proves effective for professional training of physical education teach-

ers when systematic implementation includes: interdisciplinary curriculum design combining physical education with psychology, sociology, and related disciplines; interactive pedagogical technologies (case studies, project-based learning, reflective analysis); interfaculty collaboration enabling practical application of theoretical knowledge; continuous monitoring of competence development across cognitive, affective, and behavioral domains.

Practical applications of these findings include developing integrated curricula that merge physical education with biology, psychology, history, mathematics, and arts to enhance gender competence comprehensively. Additionally, methodological guidelines based on research outcomes can assist educators in implementing gender-sensitive approaches while accounting for physiological, psychological, and social characteristics of diverse student populations.

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