

The influence of information technology on the professional readiness of future trainers in Kazaksha kures

La influencia de la tecnología de la información en la preparación profesional de los futuros formadores en Kazaksha kures

*Nurbol Kuspanov, **Tulegen Botagariyev, ***Sayat Ryskaliyev, *Aidyn Doshbekov, ****Amangazy Syzdykov, *****Aidarbek Gabitov

*Kazakh Academy of Sports and Tourism (Kazakhstan), **Aktobe Regional University named after K. Zhubanov (Kazakhstan), ***West-Kazakhstan Innovative-Technological University (Kazakhstan), ****Pavlodar Pedagogical University (Kazakhstan), *****West Kazakhstan Agrarian Technical University named after Zhangir Khan (Kazakhstan)

Abstract. The purpose of the study is to form a complex for improving the professional qualities of Kazaksha kures trainers based on virtual and additional reality technology. Participating in the study were 4th-year students majoring in Physical Culture and Sports from [BLINDED] University. After the initial assessment of the studied competencies, a virtual reality course was held. At the same time, the researchers assessed the highest competence by the "Peculiarities of support activities at training camps" and "The design of a sports facility". Conversely, the students in the control group assessed their competencies with an average rating of 3 points. The "Technology of teaching basic types of physical exercises" was the most appreciated. The professional skills of Kazaksha kures trainers represent the contribution of the paper to the world of science in the context of virtual reality.

Keywords: components; consistency; Kazaksha kures; level; professional readiness; trainer

Resumen. El objetivo del estudio es formar un complejo para mejorar las cualidades profesionales de los formadores de Kazaksha Kure basado en tecnología de realidad virtual y adicional. Participaron en el estudio estudiantes de 4to año de la carrera de Cultura Física y Deportes de la Universidad [BLINDED]. Tras la evaluación inicial de las competencias estudiadas se realizó un curso de realidad virtual. Al mismo tiempo, los investigadores evaluaron la competencia más alta en las "Características de las actividades de apoyo en los campos de entrenamiento" y "El diseño de una instalación deportiva". Por el contrario, los estudiantes del grupo de control evaluaron sus competencias con una calificación media de 3 puntos. La más valorada fue la "Tecnología de enseñanza de los tipos básicos de ejercicios físicos". Las habilidades profesionales de los formadores de Kazaksha Kure representan la contribución del periódico al mundo de la ciencia en el contexto de la realidad virtual.

Palabras clave: componentes; consistencia; kures kazajo; nivel; preparación profesional; entrenador

Fecha recepción: 14-06-23. Fecha de aceptación: 20-09-23

Nurbol Kuspanov
nurbolkuspanov16@rambler.ru

Introduction

Nowadays, national sports are actively developing in the Republic of Kazakhstan, including Kazaksha kures. The republic holds national competitions, and Kazakh athletes actively participate in international competitions. However, the works of specialists did not consider the issues of vocational preparation of Kazaksha kures trainers, according to the analysis of scientific and methodological literature. The conducted research deals with the issues of technical and tactical training in Kazaksha kures (Alimkhanov, 1996; Baishulakov, 2010; Daupaev, 2000; Sobyenin et al., 2020).

At the present stage of education development, there is a process of updating curricula in the areas of physical education. Over the past 30 years, national sports have begun to develop actively in the Republic of Kazakhstan, including Kazaksha kures. Kazaksha kures trainers receive their education at the [BLINDED] Academy (Almaty). According to the conducted scientific research, experts focused more on the issues of improving the technique and tactics of Kazaksha kures. Their works did not consider the problems of professional training. Due to the changing requirements for the training of specialists in physical education universities in general, it is necessary to understand the state of professional qualification of Kazaksha kures trainers.

The following specialists paid attention to the problem of training the specialists (Besputchik & Artemyev, 2009; Grigoryants, 2007; Khudaiberdieva, 2019; Shulzhenko, 2012).

The following elements can be marked as the contribution of this paper to world science. Firstly, these are the components of the professional readiness of Kazaksha kures trainers. Secondly, these are the ranked components of this readiness. Thirdly, recommendations on approaches related to the coincidence of experts' views about elements of professional readiness of Kazaksha kures trainers.

The practical significance of this paper is as follows. Firstly, Kazaksha kures trainers can use the obtained results, concerning the significance of the leading elements of their professional readiness. Secondly, these data will provide valuable insights for the teaching faculty at physical education universities responsible for instructing future Kazaksha kures trainers. Thus, virtual reality allows an athlete to interact with the environment and cultivate the skills necessary to achieve success. This is a valid advantage for athletes who can thus repeat certain isolated movements, in the most realistic environment and minimize the risk of injury. This technology has the potential to be used in all kinds of sports.

Literature review

The analysis of the Russian literature has strongly suggested that the research of scientists on various aspects of scientific and methodological support of the components of the professional qualification of Kazaksha kures trainers could be grouped into the following areas.

Virtual reality

Virtual reality and augmented reality technologies require a proper mixing of information about the real environment and computer-generated objects to create the desired experience, but participants will never be able to have a perfect sense of VR/AR content without tools and gadgets (Finkelstein et al., 2011). AR/VR tools work based on human perception and can involve several human senses. The tools can be visual, auditory, tactile, olfactory and external devices, such as a positioning system, which can be included in these instruments (Serin, 2020).

AR and VR technologies are related, but they are different. Before the researchers begin to define these terms precisely, they first need to know what is real and virtual (Harvey et al., 2020). Virtual and real environments are the two ends of the spectrum. Despite the complex concept of reality in philosophy, the authors consider the environment of the real world, which is limited by the laws of physics, and things in the real world can be felt directly as they exist. On the contrary, a virtual world is an environment simulated on a computer, which may or may not correspond to the laws of physics, such as time, gravity, material properties, etc. (Palamarchuk et al., 2020). In a broader sense, participants are completely immersed in a virtual world synthesized by computers. On the contrary, participants are directly represented in the real world. The spectrum between the real and virtual environment has been called the reality-virtuality (RV) continuum, and different types of AR or VR can be placed in this continuum (Szymkowiak et al., 2021).

Fundamentals of professional training of a teacher-trainer. Experts note the following. A) The analysis of the problem allowed the identification of the components of the mechanism of professional training of a future physical education teacher at a university: the guidelines and missions of the professional training process (indicative element); the essence of education that students need to learn (essential element); the work of students and teachers (technological element); the personality of a student, a graduate of a university (expected result) (effective element) (Narikbaeva, 2016; Osokin & Nagovitsyn, 2016; Shulzhenko, 2012).

The conditions for the practical preparation of a future teacher for professional activity. In this direction, experts distinguish the following: A dialogical developing educational atmosphere of the Faculty of Physical Culture based on the provisions and methods of a didactic sample of professional work (Grigorieva, 2018; Khudaiberdieva, 2019).

Professional training of physical education teachers in higher education. In this aspect, experts emphasize the following. The general professional properties and functions of a physical education teacher in a higher educational institution are

mastering the subject and methodology, psychological training, basic erudition, a broad cultural outlook, pedagogical skills, and educational methods (Besputchik & Artemyev, 2009; Rakitin et al., 2019; Shashkin, 1998).

The effectiveness of mastering the Kazaksha kures wrestling technique by students. Kazakh experts note the following. The concentrated improvement of the balance function carried out during the work of the leading analysers (vestibular, motor, visual, tactile, etc.) must be accompanied by a set of tools that include general development tasks of a gymnastic nature, tasks on shells and traditional simulators, special tasks of wrestlers, technical tasks of wrestling Kazaksha kures (Daupaev, 2000); it is more optimal to implement control of a special physical Kazaksha kures wrestlers' readiness through tests-tasks based on the implementation of such effective methods, where the adequate technical performance of motor locomotions and a specific degree of improvement of physical properties are necessary (Sobyaniin et al., 2020). New technology has been introduced to enhance the emphasis on instructing technical and tactical locomotion skills in Kazaksha kures. The dominant position here is considered to be the joint methods of dual wrestling according to the different orientations of their implementation: in the back direction, – in the front direction; in the front direction – in the back direction (Baishulakov, 2010). New wrestling clothing resulted in new techniques and a decrease in the time spent on the implementation of ten dominant body slams in the updated clothing relative to the outdated one of a student (Alimkhanov, 1996). The role of the developed tasks is expressed in the constant development of neuromuscular coordination, the qualitative optimality of relationships in the locomotion of arms and legs, helping to build a Kazaksha kures fight (Myrzabosynov, 2017).

Components of a trainer's professional readiness. In this aspect, experts note the following. A) A trainer's theoretical readiness should be evaluated in two directions. Firstly, knowledge accumulation about the object, and secondly, the idea of its creative use during the training process. Methodical readiness is a set of ways of carrying out any work. The practical readiness of a trainer is manifested in the level of its general motor culture (Myrzabosynov, 2017).

There are the following views of foreign experts.

Strengthening the knowledge of trainers. The degree of teachers' representations of taekwondo refers to the boundaries of a reduced level. The degree of correct results was below half according to various benchmarks of experience components. The total degree was equal to a quarter of the requirements. Statistical claims were found in the "Physiology of physical exercises" method regarding the degree of education and in the "Anatomy of a sports career" method regarding the level of belts (Hammad et al., 2022). Coordination between the higher education institution and the national sports training organization will be effective with mixed (online-offline) training. In university projects, focus on ethics to promote the mechanism of professionalization (Gad et al., 2022; Kjær, 2019).

The attitude of trainers and athletes to training situations.

The following stands out here. A) Parts of the information about the training work revealed relatively equal points of view and the main differences between students and teachers in addition. The schemes were not the same to “create” the information parts. However, they were interdependent between students and trainers (Macquet & Stanton, 2014). In conditions of limited time at a high level, teachers and athletes often come together to the right decisions (Kaya, 2014).

The training decision-making strategy rests on the support of athletes. Supported by a trainer, the athletes were open to autonomy and making the right decisions (Reynders et al., 2019). Based on consistency, an integrated approach to decision-making and search helps to develop an optimal starting point for studying the mechanism of finding answers and the underlying processes of a trainer's approach (Lath et al., 2021). Based on the available methods of decision-making, the researchers formed a design sample of the answer acceptance network in coordination with assessing a situation. Secondly, they created a multipurpose efficiency method in a network-planning sample with multiple answers and a simulation sample of these tasks based on actual development requirements (Cao & Mao, 2022). Based on the theory of self-determination, this experience recommends a sample of self-agreement as a basis for studying the mechanism from the choice of a guideline to its implementation, as well as obtaining influences for psychological and physical well-being (Smith, 2016).

Technology in teaching students. It is noted that the widespread introduction of video-based answer-taking teaching creates a new paradigm in team sports, adapting teaching above real-time to answer-taking to recreate a teaching scenario closer to game actions (Lorains et al., 2013). This study aims to identify the optimality of an application for assessing locomotion in coordination with a smart device embedded in a physical curriculum. Its primary focus is on the adoption of the locomotion analysis application by participants and its possible influence on the instruction of sports skills. The author tried to study the potential of a modified integrated sample of qualitative diagnostics of locomotion to influence the best teaching experience (Zulkifli & Danis, 2022).

Thus, the analysis of domestic and foreign literature on the research problem allows the researchers to conclude the following. The following issues were subject to the attention of specialists: training pedagogical personnel, conditions of practical training of future teachers for professional activity; the effectiveness of mastering the technique of wrestling Kazaksha kures; broadening the knowledge of trainers; and training decision-making strategy. For this research, the authors consider useful the following areas from what they have studied the definition of dominant strategies by trainers in their work; components of professional preparedness; and technical and tactical preparedness of Kazaksha kures wrestlers.

Purpose of the study

The purpose of the study is to form a complex of improving the professional qualities of teachers of Kazaksha

kures based on virtual and additional reality technology. The study included the following tasks:

1. Determining the components of the professional readiness of a Kazaksha kures trainer.
2. Laying out lines using virtual reality technology to improve the qualities of a Kazaksha kures trainer for an experimental sample of respondents.
3. Comparing the results of the respondents' professional qualities influenced by virtual reality technologies and trainers without using information technology in professional development.

Methodology

Research design

The study took place during the 2022-2023 academic year. The first stage (September-October 2022) included the analysis of scientific and methodological literature on the research problem. The researchers established a scientific rationale for the study. At the same time, they determined the components of the professional readiness of a Kazaksha kures trainer. To accomplish this, a survey questionnaire was administered to a cohort of expert instructors within the educational institution under investigation (n=10) (Zheleznyak & Petrov, 2002). These experts were tasked with evaluating each participant across three parameters using a 5-point Likert scale. The measurement scale employed was ordinary, discrete, and numerical. By recommendations from specialists, the researchers partitioned the trainer's professional preparedness into three distinct domains: theoretical, methodological, and practical. During this phase, the scientific research methodology of literature analysis was employed (Sabitov, 2002). To compare the mean values of the assessments, the coefficient of concordance (FB, 2022) was utilized. It was computed using the formula $W = 12S / (m^2 (n^3 - n))$, where S represents the sum of squares of scores from the average sum of squares of scores, m denotes the number of experts, and n signifies the number of indicators (in this particular context, constituting various facets of readiness).

Further, they elaborated a set of virtual reality technologies to increase the level of the studied qualities, as well as to check the influence.

The next step involved elaborating a virtual reality course to improve the quality of students. Influenced by virtual reality, each lesson aimed to develop competencies using the case method. Training included the case method to help students assimilate the curriculum material in the context of VR and AR technologies. This technology provides numerous advantages, including the ability to: (1) facilitate the learning process; (2) activate the thinking and behaviour of students; (3) form and develop the ability to analyse the acquired information; (4) find imaginative ways to the assimilation of the material; (5) formulate their opinion and express it correctly; (6) simulate different situations; (7) teach independent decision-making; and (8) immerse students fully in their professional activities.

After generating the factors, each respondent had to evaluate the influence of this factor on the choice of profession for studying at the university. The instructions for filling in the index were generated on the Likert scale: 0=no effect; 1=very low impact; 2=low impact; 3=large impact, and 4=very high impact. Based on the data obtained, the DEMATEL matrix of correlation of the obtained factors with the characteristics of the sample was formed.

Sample

32 4th-year students of the [BLINDED] University majoring in Physical Culture and Sports participated in the survey. The researchers divided the study sample into two parts to investigate the impact of virtual reality technology separately using the case method on students' academic performance. The average age of the respondents was 22.83 ± 0.89 (group 1) and 22.17 ± 0.67 (group 2); there were 93.75% of males and 6.25% of females, respectively ($p > 0.05$). The current sample resulted from the massive introduction of compulsory study of Kazakh wrestling into the curricula of Kazakhstan.

Within the scope of the current research, a simple random sampling technique was employed. Considering the total population of students in the investigated field at [BLINDED] University, the allowable margin of error does not exceed $p = 3.71$. Consequently, the current sample is considered representative for research purposes and is statistically justified within the confines of the educational institution.

Research tools

The researchers notified the students about the course at the beginning of the semester.

An experimental group of respondents attended virtual reality courses, which were taught by computer science teachers weekly 2 times after classes for 2 hours. The training included using VR glasses, the Unity 3D development environment and the Blender graphics editor. A special programme has already been created for training, which presents a variety of training cases, thanks to which the interpretation of the teaching material on the teaching of the sport under study took place. In total, 11 training cases were presented on various topics, which were then completed with a final test. The first 2 classes aimed to familiarize students with the programme. Using a virtual environment, the students could view methodological material, practically simulated situations, etc.

Data analysis

The survey used a multi-stage quota selection. The sampling error was calculated using the formula.

$$\text{SamplingErrorFormula} = Z \times \frac{\sigma}{\sqrt{n}}$$

Z is the indicator, according to the required confidence interval (95%);

n is the sample size.

σ is the standard deviation.

Thus, the sampling error was 0.677 or about 1%. This makes it possible to assess the quality of the received data as reliable, since there are not any unaccounted errors, and the recorded errors do not exceed the specified level.

The researchers tested the survey questionnaire for students and pupils for reliability using Cronbach's alpha. The interpretation of Cronbach's alpha values is as follows: >0.9 excellent; 0.8 good; 0.7 acceptable; 0.6 questionable; and >0.5 unsatisfactory (Gliem J.A. & Gliem R.R., 2003). The cumulative Cronbach's alpha value for the questionnaire was 0.936. Conclusion: the questionnaire is reliable and can be used for the survey.

Within the context of the study, the obtained result was deemed significant at significance levels of 0.01 and 0.05 (StatAnaliz, 2022). To assess the normality of data distribution, the Shapiro-Wilk test was employed with a significance level of 0.05.

Data collection process

The data obtained were processed using IBM SPSS Statistics and Microsoft Excel 2007.

Ethical issues

All participants of the study were informed about the goals and objectives of the study. The students agreed to the processing and analysis of the data collected during the survey. Although personal (gender and origin of the students) and professional (speciality of the students) information was collected for completeness, it was not disclosed to anyone in any way. The survey was conducted and coordinated with some representatives of the ethics committees of the educational institutions under study.

Limitations

The students were invited based on their speciality. However, this did not guarantee final professional affiliation to Kazaksha kures. The sample of respondents was small to unify conclusions and recommendations. The designed virtual reality application is individual and discloses individual cases of martial arts training.

Results

The researchers identified the main criteria for future trainers to have using the analysis of the methodological and theoretical base:

- 1) The provisions, tools, and methods of the Kazaksha kures training system.
- 2) The theory and technology of training Kazaksha kures.
- 3) The technology of teaching basic types of physical exercises of Kazaksha kures.
- 4) Psychological and pedagogical laws of the educational and training process for Kazaksha kures.
- 5) The specifics of sports work in the conditions of training camps for Kazaksha kures.
- 6) The sanitary and hygienic basics of physical culture

and sports activities in Kazaksha kures.

7) Injury prevention measures during Kazaksha kures classes.

8) The design features of a sports facility; provisions for the introduction and preservation of sports equipment for Kazaksha kures.

Table 1 shows the calculation of the indicators to determine the consistency of expert opinions regarding the theoretical readiness of Kazaksha kures trainers. As can be seen from the data in this table, the experts determined the theory and technology of teaching for the first and second ranks. In the second or third positions, the experts put the psychological and pedagogical laws of the students. The technology of teaching the dominant types of physical exer-

cises is in the third-fourth position, according to the experts. The experts put the peculiarities of sports work in the conditions of training camps for Kazaksha kures in the fourth-fifth place. They put the provisions, tools, and methods of the Kazaksha kures training system in fifth–sixth place.

In the sixth – seventh place, the experts noted the sanitary and hygienic basics of physical culture and sports work on Kazaksha kures. The design features of a sports facility were put in the last seventh-eighth place. According to the calculations presented in Table 1, the concordance coefficient is 0.84 for this parameter of the study. That indicates a strong consistency of the expert opinions. According to the Pearson criterion, its significance score is $10 \times 0.84 \times (8-1) = 58.8$.

Table 1.

Calculation of the indicators for 3.8 to determine the consistency of the expert opinions regarding the theoretical fitness of trainers (n=10).

	Σ ris	r _{CP}	The difference between Σ ris and r _{CP}	The square of the difference	w	Level of significance
Provisions, tools, and methods of training	55		16.8	282.24		58.8*
Theory and technology of training	15		-23.2	538.24		
Psychological and pedagogical patterns	29		-9.2	84.64		
Technology of teaching basic types of physical exercises	40		1.8	3.24		
Features of sports work at training camps	42	38.2	3.8	14.44	0.84	
Sanitary and hygienic basics of physical education	61		22.8	519.84		
Preventive measures	64		25.8	665.64		
Construction of a sports facility	76		37.8	1428.84		
Sum	382			3537.12		

* The critical value at a significance level of 0.01 is 18.5. The critical value at a significance level of 0.05 is 14.1.

Table 2.

The results of the conducted testing of the experimental and control groups of the respondents (N=32).

Criteria	Group 1, experimental	Group 2, control	p-value
Provisions, tools, and methods of training	3.88±0.75	43.16±0.62	0.058*
Theory and technology of training	4.09±0.44	3.29±0.33	0.036**
Psychological and pedagogical patterns	4.03±0.22	3.26±0.45	0.0041**
Technology of teaching basic types of physical exercises	4.22±1.11	3.76±0.39	0.054*
Features of sports work at training camps	4.55±0.78	3.01±0.54	0.061*
Sanitary and hygienic basics of physical education	4.12±0.98	3.39±0.25	0.063*
Preventive measures	4.23±0.95	3.22±0.82	0.0364**
Construction of a sports facility	4.93±0.43	3.13±0.53	0.2638*

* - $p > 0.05$, not significantly different

** - $p < 0.05$, significantly different

After the initial assessment of the studied competencies, a virtual reality course was held. Then, the students evaluated their competencies in the context of the generated qualities. According to the results in Table 2, it can be seen that most of the respondents rated their qualities above 4 points on the Likert scale in the experimental group. At the same time, the researchers assessed the highest competence by the “Peculiarities of support activities at training camps” and “The design of a sports facility”. On the other hand, the students of the control group evaluated their competencies by an average of 3 points. The “Technology of teaching basic types of physical exercises” was the most appreciated.

At the same time, the corresponding correlation of the results of the Spearman surveys indicates the difference between the results of the experimental and control samples, which indicates a similar attitude towards the studied object and the influence of the described application on the results of the survey (Table 3).

According to the Shapiro-Wilk test, the normality level of the sample distribution is 0.9881. With a significance

level of 0.05 and a sample size of 32, the critical value of the Shapiro-Wilk test is 0.996. Consequently, the distribution of values is close to normal.

Table 3.

Correlation of results between the groups by Spearman.

	1		
Experimental group	0.93684	1	
Control group	0.82654	0.82547	1

Discussion

As determined based on the obtained results, several components are included in the effective training of Kazaksha kures athletes. The data acquired is particularly valuable due to the specific nature of this sport, characterized by its narrow regional focus. It is essential to emphasize the traditional nature of this sport, primarily within Kazakhstan and other Central Asian countries. Consequently, the limited scope of research directs its attention precisely toward this unique sporting discipline.

Similar propositions regarding the prioritized structure of professional readiness for Kazakh kures instructors were presented in the work by Purakhin (2013). In general, the author identified personality-psychological and specialized professional values that are characterized by high informativeness in defining the activities of combat sports coaches. Taking into account the current positions in this article, we delve into the more detailed constituents of future trainers' preparedness and their prioritization according to expert opinion.

However, the current article establishes well-founded assertions concerning the importance of various criteria for coaches. A similar principle was substituted in the work of Kravchuk et al. (2019). The scholars also juxtaposed specialists' viewpoints, albeit in the context of aerobic exercises in the technical training of gymnasts aged 10-11 and 12-14 in sports aerobics, examining the structural groups and subgroups of aerobic exercises. Experts affirmed that dynamic power during the first three blocks included in Group A: "A-frame" from the lying position after push-ups from the lying position, the same but in the lying position with abduction, the lower front limb to the forearm, and the same with a circular turn in the lying position. Expert opinions were categorized into pairs of 4–5 parts: two experts (1 and 3) placed the circle with two legs from a lying position to a lying position and a leg to the split position, a leg on the forearm in the 4th position, and two legs apart from a lying position ("Delassal") in the same condition in the 5th position, while the other two experts (2 and 4) indicated their execution in a different order. The data in this article differ in that the researchers identified the consensus of expert opinions by calculating the concordance coefficient along with determining ranks. Such a mechanism of position determination enables future research to more effectively direct their experiments towards prioritized criteria and also delineates the trajectory for creating training programs for athletes.

When considering the aspect of innovative technologies in coaching education, it is worth noting that several concurrences are emphasizing their effectiveness in the context of various sports. Practical research by some scholars attests to the necessity of implementing virtual reality technologies in sports training to provide athletes with a fresh perspective on physical and technical preparation (Denysova et al., 2020). In the current study, this technology has also been adopted to enhance the learning process of the experimental group. Many researchers assert that virtual reality can effectively aid in training and enhance athletes' preparedness (Sattar et al., 2020; Serdakova et al., 2023). An analysis of scientific and methodological literature indicates a 30% increase in athletes' productivity in sports. Simultaneously, two-thirds of surveyed athletes believe that their interest in sports training has increased by 80%, and 90% of coaches consider the use of virtual reality technologies in sports to be a necessary component of training sessions that can elevate the technical skills and overall preparedness of athletes and contribute to their development. In sports, this

approach is particularly appealing to young athletes, as this age group constitutes the target audience for technical and informational innovations. It is precisely in this context that the value of virtual reality for training future Kazakh kures coaches is underscored. After completing this program, the assessment of students' professional skills was higher, confirming this positive effect.

Conclusion

The researchers included the following into the elements of the theoretical readiness of Kazakh kures trainers: their awareness of the provisions of the Kazakh kures training system; theory and technology of teaching training; technology of teaching basic types of physical exercises; psychological and pedagogical laws of the educational and training process; features of sports work; sanitary and hygienic foundations; construction of sports facilities; provisions of implementation and preservation sports equipment. Among the elements of the methodological readiness of Kazakh kures trainers, they identified the following: design; provisions of sports training; mission solving; organization of project work; technology of training, preparation for competitions; conducting medical control; and technology of training judges.

After the initial assessment of the studied competencies, a virtual reality course was held. Then students evaluated their competencies in the context of the generated qualities. According to the results in Table 2, it can be seen that most of the respondents rated their qualities above 4 points on the Likert scale in the experimental group. The professional skills of Kazakh kures trainers represent the contribution of the paper to the world of science in the context of virtual reality.

References

- Alimkhanov, E. (1996). *Improving the Kazakh kures national wrestling by changing the model of sportswear*. Abstract of the dissertation of a Candidate of pedagogical Sciences. Almaty.
- Baishulakov, J. S. (2010). *Optimization of the training process and increasing the role of technical and tactical training in Kazakh kures, considering modern trends in the development of types of wrestling*. Abstract of the dissertation of a Candidate of Pedagogical Sciences. Almaty.
- Besputchik, V. G., & Artemyev, V. P. (2009). Problems of physical education personnel training. *Kharkiv KhGADI (XKhPI)*, 3, 23-33. <https://sportedu.org.ua/html/journal/2009-03/09bvgpps.pdf>
- Cao, Y., & Mao, H. (2022). High-dimensional multi-objective optimization strategy based on directional search in decision space and sports training data simulation. *Alexandria Engineering Journal*, 61(1), 159-173. <https://doi.org/10.1016/j.aej.2021.04.077>

- Daupaev, M. O. (2000). *The effectiveness of mastering the Kazakh Kures wrestling technique by students of the Faculty of Physical Culture, considering the development of the equilibrium function*. Abstract of the dissertation of a Candidate of Pedagogical Sciences. Saint Petersburg.
- Denysova, L., Byshevets, N., Shynkaruk, O., Imas, Y., Suschenko, L., Bazylchuk, O., Oleshko, T., Syvash, I., & Tretiak, O. (2020). Theoretical aspects of design and development of information and educational environment in the system of training of masters in physical culture and sport. *Journal of Physical Education and Sport*, 20(1), 324-330.
- FB (2022). *Concordance coefficient: Calculation example and formula. What is the concordance coefficient?* <https://fb.ru/article/349619/koeffitsient-konkordatsii-primer-rascheta-i-formula-chto-takoe-koeffitsient-konkordatsii>
- Finkelstein, S., Nickel, A., Lipps, Z., Barnes, T., Wartell, Z., & Suma, E. A. (2011). Astrojumper: Motivating exercise with an immersive virtual reality exergame. *Presence: Teleoperators and Virtual Environments*, 20(1), 78-92. https://doi.org/10.1162/pres_a_00036
- Gad, S., Nazarova, T., Rzanova, S., & Makar, S. (2022). Social workers' job satisfaction in public institutions. *SA Journal of Human Resource Management*, 20, 7, a2127. <https://doi.org/10.4102/sajhrm.v20i0.2127>
- Gliem, J. A., & Gliem, R. R. (2003). Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales. In *Midwest research-to-practice conference in adult, continuing, and community education* (pp. 82-88). The Ohio State University.
- Grigorieva, I. P. (2018). Analysis of the problem of professional training of physical education teachers. In *Student Scientific Forum – 2016* (pp. 1-7). International Student Scientific Bulletin. <https://scienceforum.ru/2018/article/2018007381>
- Grigoryants, I. (2007). Actual problems of improving the quality of higher professional pedagogical education of specialists in physical culture and sports. *Theory and Practice of Physical Culture*, 12, 54-59. <http://sportfiction.ru/articles/aktualnye-problemy-sovershenstvovaniya-kachestva-vysshego-professionalnogo-pedagogicheskogo-obrazovaniya-spetsialistov-po-fizicheskoy-kulture-i-sportu/>
- Hammad, S., Hammad, R., Djemai, H., Dabayeb, I. M., & Ghanima, S. (2022). The knowledge level of Taekwondo coaches regarding physical training methods in Jordan. *Science & Sports*, 37(7), 631. <https://doi.org/10.1016/j.scispo.2022.02.001>
- Harvey, S., Carpenter, J. P., & Hyndman, B. P. (2020). Introduction to social media for professional development and learning in physical education and sport pedagogy. *Journal of Teaching in Physical Education*, 39(4), 425-433. <https://doi.org/10.1123/jtpe.2020-0004>
- Kaya, A. (2014). Decision making by coaches and athletes in sport. *Procedia-Social and Behavioral Sciences*, 152, 333-338. <https://doi.org/10.1016/j.sbspro.2014.09.205>
- Khudaiberdieva, N. A. (2019). Actual problems of training pedagogical personnel in physical culture and sports. *Bulletin of Science and Education*, 10.3(64), 73-75. <https://cyberleninka.ru/article/n/aktualnye-problemy-podgotovki-pedagogicheskikh-kadrov-po-fizicheskoy-kulture-i-sportu>
- Kjær, J. B. (2019). The professionalization of sports coaching: A case study of a graduate soccer coaching education program. *Journal of Hospitality, Leisure, Sport & Tourism Education*, 24, 50-62. <https://doi.org/10.1016/j.jhlste.2018.11.001>
- Kravchuk, A. I., Savchak, D. A., & Davydova, I. A. (2019). The content of technical training at the training stage in sportive aerobics. *Scientific Notes of the University named after P. F. Lesgaft*, 7(173), 93-99. <https://cyberleninka.ru/article/n/soderzhanie-tehnicheskoy-podgotovki-na-trenirovochnom-etape-v-sportivnoy-aerobike>
- Lath, F., Koopmann, T., Faber, I., Baker, J., & Schorer, J. (2021). Focusing on the coach's eye; towards a working model of coach decision-making in talent selection. *Psychology of Sport and Exercise*, 56, 102011. <https://doi.org/10.1016/j.psychsport.2021.102011>
- Lorains, M., Ball, K., & MacMahon, C. (2013). An above real time training intervention for sport decision making. *Psychology of Sport and Exercise*, 14(5), 670-674. <https://doi.org/10.1016/j.psychsport.2013.05.005>
- Macquet, A. C., & Stanton, N. A. (2014). Do the coach and athlete have the same "picture" of the situation? Distributed Situation Awareness in an elite sport context. *Applied Ergonomics*, 45(3), 724-733. <https://doi.org/10.1016/j.apergo.2013.09.014>
- Myrzabosynov, E. K. (2017). Improving the technical and tactical readiness of Kazakh-Kures wrestlers by using summing exercises at the initial stage of sports specialization. *Bulletin of KazNPU*, 1, 1-6. <https://articlekz.com/article/19419>
- Narikbaeva, L. M. (2016). University students' giftedness diagnosis and development. *International Journal of Environmental and Science Education*, 11(17), 10289-10300.
- Osokin, G. V., & Nagovitsyn, R. S. (2016). Fundamentals of professional training of a teacher-coach for the development of physical culture of adolescents in the educational and training process of a secondary school. In *Student Scientific Forum – 2016* (pp. 1-11). International Student Scientific Bulletin. <https://scienceforum.ru/2016/article/2016022956>
- Palamarchuk, O., Gurevych, R., Maksymchuk, B., Gerasymova, I., Fushchey, O., Logutina, N., Kalashnik, N., Kylyvnyk, A., Haba, I., Matviichuk, T., Solovyov, V., & Maksymchuk, I. (2020). Studying innovation as the factor in professional self-development of specialists in physical education and sport. *Revista Romaneasca Pentru Educatie Multidimensionala*, 12(4), 118-136. <https://doi.org/10.18662/rrem/12.4/337>

- Purakhin, N. F. (2013). *Pedagogical diagnostics of professional qualities of a martial arts trainer*. Abstract of the dissertation of a Candidate of pedagogical Sciences. Moscow. <https://nauka-pedagogika.com/pedagogika-13-00-08/dissertaciya-pedagogicheskaya-diagnostika-professionalnyh-kachestv-trenera-po-sportivnym-edinoborstvam>
- Rakitin, V. V., Lobachev, D. A., & Dmitrieva, M. C. (2019). Professional training of physical education teachers in higher education. *World of Pedagogy and Psychology*, 12, 82-86. <https://scipress.ru/pedagogy/articles/professionalnaya-podgotovka-prepodavatelej-fizkultury-v-vyshej-shkole.html>
- Reynders, B., Vansteenkiste, M., Van Puyenbroeck, S., Aelterman, N., De Backer, M., Delrue, J., De Muynck, G.-J., Franssen, K., Haerens, L., & Broek, G. V. (2019). Coaching the coach: Intervention effects on need-supportive coaching behavior and athlete motivation and engagement. *Psychology of Sport and Exercise*, 43, 288-300. <https://doi.org/10.1016/j.psychsport.2019.04.002>
- Sabitov, R. A. (2002). *Fundamentals of scientific research: Textbook*. CSU.
- Sattar, M., Palaniappan, S., Lokman, A., Shah, N., Khalid, U., & Hasan, R. (2020). Motivating medical students using virtual reality based education. *International Journal of Emerging Technologies in Learning*, 15(2), 160-174. <https://doi.org/10.3991/ijet.v15i02.11394>
- Serdakova, K. G., Shelest, V. I., Krylova, N. A., Smirnikova, O. V., Khersonsky, I. I., & Shubina, V. F. (2023). Features of the emotional sphere of the personality of urban medical students in the educational process. *Integration of Education*, 27(2), 245-261. <https://doi.org/10.15507/1991-9468.111.027.202302.245-261>
- Serin, H. (2020). Virtual reality in education from the perspective of teachers. *Amazonia Investiga*, 9(26), 291-303. <https://doi.org/10.34069/AI/2020.26.02.33>
- Shashkin, G. A. (1998). *Organizational and pedagogical aspects of the system of training specialists by universities of physical culture of the Russian Federation in the context of higher education reform*. Abstract of the dissertation of a Candidate of Doctoral Sciences. Saint Petersburg.
- Shulzhenko, A. V. (2012). *Problems of training specialists in the field of physical culture and sports*. SuperInf. https://superinf.ru/view_helpstud.php?id=2277
- Smith, A. L. (2016). Coach behaviors and goal motives as predictors of attainment and well-being in sport. In *Sport and exercise psychology research* (pp. 415-432). Academic Press. <https://doi.org/10.1016/B978-0-12-803634-1.00019-4>
- Sobyanin, F. I., Rakhmetzhanov, A. S., Makashev, S. A., & Ismagulov, K. I. (2020). Assessment of special physical fitness of young Kazaksha kures wrestlers. *Theory and Practice of Physical Culture*, 1, 76-78. <https://cyberleninka.ru/article/n/otsenka-spetsialnoy-fizicheskoy-podgotovlennosti-yunyh-bortsov-kazahsha-kures>
- StatAnaliz (2022). *Pearson's criterion χ^2 (Chi-squared)*. <https://statanaliz.info/statistica/proverka-gipotез/kriterij-soglasiya-pirsona-khi-kvadrat/>
- Szymkowiak, A., Melović, B., Dabić, M., Jeganathan, K., & Kundi, G. S. (2021). Information technology and Gen Z: The role of teachers, the internet, and technology in the education of young people. *Technology in Society*, 65, 101565. <https://doi.org/10.1016/j.techsoc.2021.101565>
- Zheleznyak, Y. D., & Petrov, P. K. (2002). *Fundamentals of scientific and methodological activity in physical culture and sports: Textbook for students of higher educational institutions*. Publishing Centre "Academy".
- Zulkifli, A. F., & Danis, A. (2022). Technology in physical education: Using movement analysis application to improve feedback on sports skills among undergraduate physical education students. *Social Sciences & Humanities Open*, 6(1), 100350. <https://doi.org/10.1016/j.ssaho.2022.100350>