Problems and Prospects of Formation of Digital Competence of Future Scientific and Pedagogical Workers of Higher Education Institutions Through Gamification: Opportunities Kahoot, Quizlet in the European Union

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Abstract

This article discussed the trends and features of the formation of digital competence of future teachers through virtual games such as Kahoot and Quizlet. The purpose of this article was to identify modern features of the use of virtual games in the educational process of future teachers in European Union. To achieved this goal, an analytical study was conducted on the use of Kahoot and Quizlet in education. A logical, historical, and comparative legal method was used to research prospects of formation of digital competence of future scientific and pedagogical workers of higher education institutions through gamification. Using a comparative legal method, a comparative analysis of the level of use of gamification tools. As a result, conclusions were made about a significant increase in the level of use of gamification tools in various types of educational activities of future research and teaching staff. It was determined that there are negative and positive effects of gamification. It is concluded that the use of gamification tools in various types of educational activities requires students to develop additional skills that are necessary in today's world. Active use of Kahoot, Quizlet in education helps to improve students' adaptive and social skills, quickly analyze their achievements and easily convey new information. Moreover, this format contains features before the usual learning format. Therefore, the problem of developing appropriate methods and skills of gamification in education was becoming urgent. As a result, it was determined that the topic of effective use of gamification tools in education is becoming increasingly important.

Keywords: education, virtual reality, digital competencies, information technologies, digitalization, virtual game

1. Introduction

The relevance of this work is determined by the sharp increase in the importance of media resources and digital technologies in human life. The use of digital devices as reading tools has garnered increased importance (Singer & Alexander, 2017).

Accordingly, there is a question about the need to adapt and form digital competencies in students and teachers. Especially important are the needs for the formation of digital skills in students of pedagogical specialties, the possibility of using gamification tools in vocational training to achieve Goal 4 Sustainable Development Goals.

After all, the use of virtual resources and games in the educational process can greatly facilitate the process of obtaining and assimilating new information, testing knowledge, analyzing the positions of different groups of students.

Due to the fact that this field is relatively new, it is still insufficiently studied due to its novelty and versatility. In 1992, a literature review was conducted to examine the differences that may exist when reading from a printed source and an electronic source (Singer & Alexander, 2017).

It is important that media technologies play a significant role in education, especially during the 2019-2022 pandemic crisis. As a result of the COVID-19 coronavirus pandemic, information and communication technologies in all spheres of human life, including education, has increased dramatically.

As a result, current social trends, the formation of the information society and rapid changes in society create the need for appropriate quality humanities education for quality training of future teachers and educators in accordance with the goals of sustainable development (Aniobi et. al., 2021).

Therefore, the introduction of effective and innovative technologies in the educational processes of subjects from around the world is becoming increasingly urgent in modern society. Accordingly, this necessitated an urgent study of this issue. Thus, the need and opportunities of the educational process with the help of modern virtual technologies is growing significantly. However, there are significant problems and unresolved issues in the use of gamification in the modern educational process. Access to technology and the Internet, as well as the impact of intellectual and communication tools on human health, remains a pressing issue. Also, rapid changes in technology and software require rapid adaptation of teachers to new modern requirements.

The rapid change and development of information technology encourages the search for new ways to interest students in learning and improve the efficiency of perception and processing of new information in the information age. Given the information trends, the introduction of new promising tools and teaching methods is a key issue of the twenty-first century. In the context of a large information load, society poses new challenges to the world, including the need for new ways and methods of providing educational information. Therefore, there is a need for a detailed study of relevant issues. It is these factors that determine the relevance of this article.

The purpose of this article is to identify current trends and features of the use of virtual games in the educational process of future teachers. To achieve this goal, an analytical study was conducted on the use of Kahoot, Quizlet in the educational process in different countries.

This article defines the following tasks:

-determine the place of use of virtual games in the educational process;

- to analyze the state of practical use of virtual games in the educational process;

- to identify the main gaps and trends in the use of virtual games in the education system of different countries.

2. Literature review

The issue of the development of new virtual tools and technologies in education is devoted to many works of world scientists in recent years. Accordingly, this indicates the growing importance of this issue in the world.

A 2017 scientific paper points out that the advent of information and communication technologies provides information and convenience to be able to follow online learning so that learning and learning can be organized without space and time constraints. Today, online learning is offered by much higher education and commercial institutions. Various strategies for increasing student motivation in online learning have been studied, one of which is through the gamification approach. It was found that previous studies have used motivational theories to stimulate the internal and external level of gamification approach in education (Saputro et al., 2017).

A 2017 study notes that using Kahoot as an additional learning tool also had pedagogical implications: on the one hand, it increased students' self-esteem. In addition, it allowed them to swap roles with the teacher, who was now the coordinator and facilitator, while the students developed their questionnaire, thus increasing their creativity by providing feedback to those who gave incorrect answers. Moreover, the teacher had the opportunity to receive direct feedback and instant access to each of the students' answers, thus having a clear idea of their problems and focusing on their difficulties and misunderstandings. However, the greatest use of Kahoot has helped students in learning and introduced them to one of the most important life skills: the ability to learn and teach, to become autonomous and self-regulated (Tsihouridis et al., 2017, p. 602–612).

The 2018 article says that technologies are now widely integrated into education, such as mobile devices, computers, media and software. Teachers could integrate different resources through online applications and platforms. However, the strategy of using Kahoot is not for everyone, so teachers are encouraged to be aware of individual differencess in

student curriculum development, teaching activities and assessment before adopting the use of virtual games as a teaching and learning strategy. Taking into account students' gender differences, prior knowledge and multiple intelligences can be good advice for improving the effectiveness of teaching and learning (Hou, 2018, p. 31–37). Research has shown that there are gender differences in information perception and data performance. However, today there is no proper approach to the identification and consideration of individuals in the use of gamification in education.

Another 2018 study also confirms the effectiveness of gamification tools in education. The author states that despite the possible risks of introducing information technology into the education system, they are a very positive contribution to learning, as they promote learning, increase their interest, motivation and creativity, improve problem-solving, promote teamwork, strengthen self-esteem and give they have more autonomy in learning. overcoming barriers of time and space.

Digital games in education have evolved markedly, largely due to technological developments. Excessive complexity and lack of functionality of clickers born in the early 21st century as personal response systems have given way to online applications for questionnaires such as Kahoot, which allow teachers to instantly test understanding of different concepts, allowing continuous assessment of students (Orcos Palma et al., 2018, p. 37–47).

Further in 2018, it was determined that digital games and multimodal resources could be linked to teachers in the classroom if they were used as a way to motivate and engage students in learning and practice. Since motivation is an individual component and an important factor for learning a second language, the use of multimodal resources can increase motivation and involvement of students in the learning process (Lauermann & Barbosa, 2018, p. 70–79).

A 2019 study confirmed that the use of the Kahoot platform in the classroom provided greater and better interaction between student / teacher and student / student, turning the teacher into a facilitator. At the same time, this platform contributes to the social and moral formation of personality, especially when working in a group, arousing respect among individuals among colleagues. The use of kahoot give the possibility to learning significant outcomes, caused students a sense of challenge, caused more interest and enjoyment of learning (Martins et al., 2019, p. 161–169).

In 2019, it was noted that online education provides unprecedented access to learning opportunities, as evidenced by its role during the coronavirus pandemic in 2020, but adequate support for a variety of students will require more than just easy intervention (Kizilcec et al., 2020, p. 14900-14905).

The next article in 2021 analyzes virtual reality technology, which has shown great potential in the educational, commercial and medical fields. To provide the public with adequate knowledge and information about COVID-19, the study develops a VR system related to teaching knowledge about COVID-19 (Xing et.al., 2021).

Other research in 2021 shows that a student-centered approach is needed to address the above issues and provide a more effective and engaging learning experience. This approach creates an environment for learning that takes into account the individual differences of students, such as their goals, background, limitations and learning preferences (Raleiras et. al., 2022).

Also in the scientific work of 2022, it was pointed out that virtual reality and augmented reality continue to play an important role in vocational training in the current era of pandemic and industrial revolution 4.0. Instructors and trainers could consider the use of virtual technologies to develop practical learning experiences (Chan et al., 2022).

Another 2022 study analyzed the use of virtual reality in medical education, a rapidly expanding field. The authors note that there is a clear lack of research from low- and middle-income countries. The use of virtual reality tools, which have proven effective in high-income countries, may not be possible in other settings due to certain constraints, such as lack of financial resources, knowledge or technology. Given the potential of relevant technologies to improve health education, there is a need to develop and evaluate virtual reality tools that are specific to low- and middle-income countries. Further, there was a lack of research on the use of virtual reality to develop soft skills such as communication skills or empathy (Jiang et.al., 2022).

Article 2022 states that educators today consider e-books as a potential tool for "education", as they often include multimedia features for learning (Chen, 2022).

Accordingly, the results of the 2022 study showed that most of the participants' knowledge increased as a result of simulation in virtual reality, and indicated that they learned and felt that it was most useful. The results also showed that the majority of participants praised the design of the modeling (Hoffman et al., 2020, p. 1-9) however, recent research has shown that the accuracy of knowledge assessment using multiple-choice tests depends largely on the divergence of distractions. The order and duration of reviews of distractions provide important information for

detailing knowledge assessments and fraud detection. To date, no accurate and precise method of segmentation of time spent on a single element of the quiz has been developed (Sherbina, 2022).

The use of game technology in the educational process has long been studied by scientists and practitioners around the world. At the same time, the Covid-19 pandemic significantly affected the introduction of virtual technologies in the educational process. Scientists say that there is a need to review the content of work programs, to actively implement digital technologies in the educational process. The practical significance of the study is to improve and implement methods of teaching specialized disciplines with the use of modern digital tools in the learning process (Lemeshko et al., 2021). Thus, the effective implementation of gamification techniques using digital technologies requires an electronic information and educational environment - remote support for online courses, digital communications between teachers and students, as well as teachers with IT competencies.

Thus, the issue of forming the digital competence of future teachers through gamification is becoming more widespread in the world. As a result, today the world is on the path of a new type of information consumption and informatization, which accelerates global trends and forms a new type of thinking, and as a consequence, a new type of information person.

Research on the impact of information technology on people and the formation of information culture skills are promising. Methodologies for the use of gamification in education are important. The educational and scientific process became dependent on new ways of presenting information and communication capabilities of teachers. As a result, many new unresolved issues remain that need to be explored and addressed.

3. Method

This scientific article uses modern general scientific and political-legal research methods to analyze the state of use of gamification of Kahoot and Quizlet in the educational proces.

It is important to single out the comparative method used to analyze the use of virtual technologies in education in the European Union the twenty-first century.

Also, the historical method was used, which was used to study and analyze the preconditions for the development of such means of gamification, as well as to study their impact on EU educational practice. These methods allowed analyze the socio-political situation and practical developments in the methodology of teaching with the help of gamification.

The method of systematization is applied in the work, which provided an opportunity to generalize and systematize the consequences of using Kahoot, Quizlet in education. A systematic review of the scientific literature was carried out, followed by a comprehensive analysis of data related to the use of gaming virtual technologies.

In this case, European scientific and practical materials on the topic of the study were analyzed. The formation of the sample took place through the use of sources that allowed us to explore the prerequisites and features of the formation of digital competence in future teachers by means of gamification. This provided an opportunity to analyze the patterns of development of digital competencies in the world.

Then the paper analyzes the practical experience of the European Union. Scientists support and positively evaluate the use of gamification in the educational process. However, there are no proper methodologies and effective programs and research on the use of Kahoot, Quizlet in education process.

Accordingly, an analysis of the legal framework in this area was conducted. The research procedure included determining the relevance and prospects of this topic for research. Then there was an analysis of scientific and practical methods and approaches used for research.

At the first stage of the study, a review of scientific sources for the period from 2017 to 2022 was conducted in order to analyze the main aspects and theoretical foundations of digital technologies in the EU. There was a selection of materials for the study on the basis of an integrated approach, which allowed a comprehensive study of the article and identify the main problems and prospects for the study of the formation of digital competencies. Materials on the basis of territoriality were also selected, which made it possible to determine the state of development of this problem in different regions of the EU.

The next stage involved the selection of practical materials for research on the basis of an integrated approach, which allowed to study the material. Also, with his significant support was possible to identify the main problems and trends in the use of gamification tools.

Next, we analyzed the features of European usage policy and identified significant differences in approaches to the use of virtual technologies within the EU.

To verify the results, we analyzed the relevant EU regulations. Appropriate monitoring of practical materials on the research topic was carried out. As a result, based on the study, we formed conclusions and recommendations.

4. Results

Analysis of research has shown that the formation of digital competence of future research and teaching staff of higher education institutions by means of gamification is an urgent area of research. The emergence and development of this area is associated with the formation of the information society and the need for new approaches to learning.

First of all, it should be noted that in general in the EU the level of digital competence increased significantly from 2016 to 2019 (Eurostat, 2021).

Table 1. Individuals' Level of Digital Skills in % (until 2019)

	Individuals who have basic digital skills			
Country	2016	2017	2018	2019
Belgium	60	61	61	61
Bulgaria	31	26	29	29
Czechia	57	54	60	62
Denmark	75	78	71	70
Germany	67	68	68	70
Estonia	65	60	60	62
Ireland	44	44	48	53
Greece	44	46	46	51
Spain	54	53	55	57
France	57	56	57	57
Croatia	51	55	41	53
Italy	43	44	n/a	42
Cyprus	43	43	50	45
Latvia	49	50	48	43
Lithuania	51	52	55	56
Luxembourg	86	86	85	65
Hungary	50	51	50	49
Malta	53	50	57	56
Netherlands	72	77	79	79
Austria	64	65	67	66
Poland	40	44	46	44
Portugal	48	48	50	52
Romania	26	28	29	31
Slovenia	51	53	54	55
Slovakia	53	55	59	54
Finland	74	73	76	76
Sweden	72	69	77	72
Iceland	n/a	n/a	85	85
Norway	80	75	77	83
Switzerland	n/a	n/a	76	77
United Kingdom	67	69	71	74
Montenegro	n/a	n/a	50	n/a
North Macedonia	37	34	32	32
Serbia	32	n/a	39	46
Turkey	23	28	34	36

Source: Eurostat, 2021

Further, the analysis of the data showed that the level of digital inclusion of people in the EU has increased significantly in 2019 -2022 years, which is obviously due to the pandemic.

Table 2. Digital Inclusion - Individuals

	Digital inclusion - individuals					
Country	2016	2017	2018	2019	2020	2021
Belgium	84	86	87	89	90	91
Bulgaria	58	62	64	67	69	74
Czechia	79	81	84	85	86	87
Denmark	94	95	95	95	97	97
Germany	87	87	90	91	93	89
Estonia	85	86	87	88	88	90
Ireland	79	79	80	88	89	98
Greece	66	67	70	74	77	77
Spain	76	80	83	88	91	92
France	82	83	85	87	n/a	89
Croatia	71	65	73	77	78	80
Italy	67	69	72	74	76	n/a
Cyprus	74	79	84	85	91	91
Latvia	77	78	81	84	87	90
Lithuania	72	75	78	81	82	86
Luxembourg	97	96	92	93	96	97
Hungary	78	76	75	80	84	87
Malta	77	80	80	85	86	87
Netherlands	92	94	94	95	93	94
Austria	82	85	85	86	86	89
Poland	70	73	75	78	81	84
Portugal	68	71	71	73	76	80
Romania	56	61	68	72	76	82
Slovenia	73	77	79	81	85	88
Slovakia	78	79	78	82	88	87
Finland	91	92	93	93	95	95
Sweden	91	95	91	95	95	95
Iceland	n/a	98	99	98	99	99
Norway	96	96	97	98	96	98
Switzerland	n/a	91	n/a	95	n/a	96
United Kingdom	93	93	94	95	96	n/a
Montenegro	n/a	69	70	72	77	81
North Macedonia	70	73	78	80	80	n/a
Albania	n/a	n/a	62	68	n/a	n/a
Serbia	n/a	68	72	76	78	80
Turkey	55	61	69	73	76	81

Source: Digital inclusion – individuals (Eurostat, 2021).

Accordingly, the use of virtual reality gaming technologies in humanities education is becoming more widespread. Among the most common virtual gamification tools: Kahoot, Quizlet. Moreover, Kahoot is already actively used in education in European Union (Brezolin et al., 2021, p. 3–16).

Table 3. Market Share and Internet Usage Statistics Kahoot

Sphere	Popularity
Science and education	44,83%
Games	3,14%
Arts and entertainment	1,84%
Society and society	1,76%
others	48,43%

Source: SimilarTech Ltd. (2021).

They create new opportunities to improve skills and memorize information quickly.

It is important to note that different countries have different approaches to regulating the use of virtual technologies in education.

Thus, it can be argued that in Europe, approaches are gradually developing to support and ensure the formation of gamification skills in the educational process.

5. Discussion

The problem of the use of gamification such as taking into account students' gender differences, prior knowledge and multiple intelligences in education pricess has become extremely relevant in recent years in the European Union. With the advent of Web 2.0 technologies on the Internet and the development of the information society, fundamental changes have taken place in the way information is consumed and exchanged.

The integration of technology and digital learning methods into the educational process has been gradually expanding in recent years. In many cases, students can use tablets in class and do homework online (Moorhouse & Wong, 2021, p. 51–70) COVID-19 has had a devastating effect on humanity. However, it has also led to one of the greatest opportunities for innovation in education in human history. In almost every country and territory, teachers had to find ways to support the learning of their students outside the physical classroom. Therefore, there is a need to identify new approaches and methods of educational development to achieve Goal 4 of the Sustainable Development Goals. In 2022 digital skills are crucial important for work, study and social interaction. SDG 4 aims to provide people with access to fair and quality education at all stages of life, as well as to increase the number of young people and adults with relevant skills for employment, decent work and entrepreneurship. The goal also includes eliminating gender disparities and income inequality in access to education. SDG 4 on inclusive and quality education for all, which is included in the European Commission's priorities in the sections "A Europe approaching the digital age", "An economy that works for people" and "Promoting our European way of life". The European Skills Program aims for the EU to increase the proportion of people aged 16 to 74 with at least basic digital skills to 70% by 2025. The Council Resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021-2030) (2021 / C 66/01) (European Union, February 26 2021) identifies the following five strategic priorities for the period 2021-2030:

- improving quality, equality, inclusiveness and success for all in education and training;

- development of lifelong learning methods and mobility a reality for all;

- increasing competence and motivation in the education profession;

- strengthening European higher education;

- supporting the green and digital transition in and through education and training (European Education Area, 2020). In the EU, young people aged 16 to 24 have been involved in various forms of online learning and online use more than the average adult population. In 2021, 39% of young people reported taking an online course and 49% used online learning materials, compared with 23% and 27% of adults aged 25 to 34 and 20% and 23% of adults aged 35 to 44 years. continue to decline with increasing age, reaching the lowest point among the elderly (aged 65 to 74), where 3% took an online course and 4% used online learning materials.

In 2021, of all the EU Member States, Ireland had the highest share (46%) of people aged 16 to 74 who took an online course or used online learning materials. Finland and Sweden registered a share of 45%, followed by the Netherlands with 44%.

At the other end of the scale, online courses or online learning materials were not very common in Romania (10%), Bulgaria (12%) and Croatia (18%).

Compared to the 2019 pandemic, the proportion of people taking online courses or using online learning materials has increased in all member states, except Romania, where it has fallen (-4 percentage points) to 10%. Among the sharpest increases were the Netherlands (+21 percentage points), followed by Luxembourg and Slovenia (both +19 percentage points) and Greece (+18 percentage points) (Eurostat, 2022). Thus, global digitalization has led to a significant need to review and improve the educational process.

Thus, widespread access to the Internet is one of the factors that has accelerated the introduction of technological innovations in the education sector. Ideas are spreading fast, and people can explore the best ways to use technology in education. Hardware companies make devices such as laptops and tablets that are tailored to specific educational needs. Moreover, the introduction of interactive methods, in particular the case method, can help to reduce the gap between the professional opportunities of graduates and the needs of patients. The use of the case method in medical education affects the learning outcomes of students and gaining practical experience. The case method also increases students' confidence in their professional abilities (Korniichuk et.al., 2021).

Competition between different technology firms is another factor that will accelerate the pace of technological innovations (World Economic Forum, 2021).

Accordingly, teaching and learning have witnessed accelerated change and development in the twenty-first century, especially in terms of integrating technology with learning through new learning strategies and types of blended learning. Thus, higher education institutions seek to use these advanced instructions and methods to educate students in the desire to achieve a high quality education that meets global criteria (Eltahir et al., 2021, p. 3251–3278). Gamification is becoming more common in education every year. It is a technique that facilitates formative assessment and promotes student learning. Moreover, this technique has been shown to be more effective than traditional methods (Ismail et al., 2019). Accordingly, the term "digital game" in education is far-reaching and often means a wide range of game types and genres, including ways to integrate games to support teaching and learning. Collectively, the broad integration of digital game-based learning into the educational context emphasizes the importance of entertainment in education. The renewed emphasis on digital games in education emphasizes the changing nature of students and the ways in which they participate in the learning process (Obery et al., 2021, p. 454–463). Quizlet Learn is based on the Learning Assistant platform, which uses machine learning to process the data of millions of anonymous sessions, and then combines this data with proven methods of cognitive science. By understanding how people actually learn, this powerful platform stimulates learning that becomes more effective and efficient only by showing students the material they need to learn and making it accessible (Quizlet Inc., n.d.). The types of questions in Quizlet have been carefully designed to help you learn effectively and efficiently. When students answer written questions from memory (instead of copying the answers), it requires diligent searching or "remembering", which really helps to learn. Multiple-choice questions are designed to help you answer more questions in less time, with the added bonus of helping you find out the wrong answers. Moreover, this program uses the latest research and technology attenuation of leadership. Learning is most effective when the student receives more learning support at an early stage, but gradually receives less and less until the guide "disappears" completely. Quizlet provides this progress by moving the student from simple multiple-choice questions to more complex written questions. Also, Quizlet helps the student to set a goal of learning. And accordingly, the program helps to pass a quick preliminary test, which is a powerful way to learn better. Accordingly, answering multiple-choice questions with competing alternatives may increase performance in the next test, not only to questions about previously verified information, but also to questions about previously unverified related information, including the question of information concerning previously incorrect alternatives.

In 2020, Quizlet introduced free lesson plans for teachers to help them promote meaningful discussions of social justice by providing them with high-quality educational resources. Effectiveness has been proven by the fact that more than 200,000 teachers and students review and interact with these resources, with 80% of teachers saying that students were involved and 51% of teachers saying that the resource was effective for them in the educational process (Quizlet Inc., n.d.). Quizlet collaborates with organizations such as The 1619 Project from The New York Times, NPR, Newsela, Teaching Tolerance, and others to provide a free digital library of educational materials on the history of systemic racism and other forms of harassment in the United States. The results show that students welcome the use of this game, and they have become more engaged and motivated during the learning process (Eltahir et al., 2021, p. 3251–3278).

Also, in recent years, chatbots have found application in education, especially in higher education (Plantak Vukovac

et al., 2021, p. 216–229). Chatbots show perspective as a new way to support students. However, the central problem of new technologies, such as chatbots, is whether students trust this technology (Brezolin et al., 2021, p. 3–16). At the same time Kahoot! is a real-time learning platform that is a free formative assessment tool widely used in education. It is one of the most popular gaming learning platforms with 70 million monthly active unique users (Wang & Tahir, 2020). Kahoot! allows teachers to create four different types of games that include quizzes, polls, clutter, and discussion in which participants compete with each other. Kahoot! offers a number of benefits: free; uses several root formats; is user-friendly; facilitates participation through automatically generated game pin; compatible with smartphones, tablets and computers; has music and colorful illustrations that delight; and has flexible and adjustable answer times based on question complexity. In addition, teachers can download, view and save student results to analyze student performance (Ismail et al., 2019). Kahoot! is a global learning platform that seeks to enable everyone, including children, students and staff, to reach their full learning potential.

And the Kahoot project! The Academy is a global community and knowledge platform for all creators, students and providers of learning. Every month, more than 40 million participating players worldwide use ready-to-use content created by trusted content creators and publishing partners such as Star Wars, Disney, the United Nations, Microsoft, etc. (Kahoot! All Rights Reserved, n.d.).

Thus, digital learning environments are extremely effective in terms of satisfaction of medical students and staff, achievement (Tsekhmister et al., 2021). However, there is little research on the risks of gamification of the educational process.

Technological progress is modernizing our way of life with changes taking place both around the world and in the country. These technological improvements also have adverse effects in the form of security threats (Dai & Boroomand, 2021). Research shows that several design factors involved in digital learning can increase cognitive load. For example, feeling completely immersed in the virtual world during a learning task may create a whole new learning experience compared to learning through traditional media, but this immersion can also lead to depletion of students' cognitive resources in the experience itself, rather than promoting learning (Skulmowski & Xu, 2021, 171–196).

Next, the physical risks include a sedentary rhythm of life. Sedentary behavior is now common, as most modern work is performed while sitting. However, such sedentary behavior has been found to increase the risk of a number of diseases, including diabetes, cardiovascular disease, and all-cause mortality. Current interventions are mostly reactive and are triggered after the user has already led a sedentary lifestyle (He & Agu, 2021). The harmful effects of a sedentary lifestyle on health have been identified in various medical studies. Several systematic reviews have recently confirmed that a sedentary lifestyle is a real health problem in modern society.

There are also health risks: vision loss, overweight, fatigue, depression.

Prolonged use of gamification can lead to addiction. Moreover, Internet technology has a significant impact on the nervous system. However, these aspects have been little studied as of 2022.

Scientists unanimously point to the growing role of virtual games in the educational process, but do not provide specific methods for research.

The results of the study show that every year the percentage of the use of virtual games in the educational process increases. However, the impact of the use of virtual games in the educational process on human health and life, information security and research on gender balance and free access to technology has not been comprehensively studied. As a result, the relevance of this study is due to new information needs that have posed new challenges to the world community.

6. Conclusions

As a result of the research, we can conclude that this topic is relevant in the world. The development of digital technologies and competencies in society, the formation of the information society contributes to the growth of the use of digital opportunities in education, among which high efficiency has shown gamification.

The issue of innovative development in education is becoming increasingly important in the world community. Globalization, informatization and cultural and political changes have led to a significant need to review and improve the educational process. Accordingly, the relevance of this study is due to new societal challenges and needs, a number of information and environmental threats that have posed new challenges to the community around the world. Accordingly, this was reflected in educational needs. The world community is actively developing the educational

direction to meet the requirements of modern society.

It is necessary to emphasize the importance of developing a methodology for using gamification during the educational process. The end result of such learning should be a new kind of thinking of students, when science is seen as a tool, a means of solving educational problems. It should be noted that society has a tendency to increase the use of information technology in education.

Further researches of formation of skills of information culture and methodology of use of means of gamification in education are perspective.

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