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RESEARCH ARTICLE

Improving the Technology of Preparing Future Teachers for Internet Risk Prevention

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Abstract

This article examines the problem of improving the technology for preparing future teachers for internet risk prevention. The rapid development of digital technologies in the modern educational environment gives rise to new pedagogical challenges associated with internet risks. Within the framework of the study, a classification of internet risks, a model for forming digital security competence in future teachers, and an innovative educational-methodological complex on internet risk prevention in educational institutions have been developed. The results of experimental work confirmed the effectiveness of the proposed technology.

KEYWORDS

Internet safety, digital competence, pedagogical technology, prevention, future teacher, digital literacy, cyber threat.

INTRODUCTION

The rapid development of information and communication technologies in the 21st century is having a profound impact on the education system. On the one hand, the introduction of the Internet into the educational process opens up great opportunities, but on the other hand, it creates new dangers - internet risks. This is especially important for future teachers who work with children and adolescents or will work in the future.

The resolution of the President of the Republic of Uzbekistan on the 'Digital Uzbekistan - 2030' strategy of July 11, 2022 and the 'On measures to improve the quality of education and upbringing' of November 6, 2020 determined the need to increase digital literacy, especially among young people, and ensure cybersecurity. However, the issue of preparing future teachers for internet risk prevention in the education system has not been sufficiently studied.

The analysis of the research shows that in the process of training pedagogical personnel in modern higher educational institutions, there is a lack of special courses and methodological support for digital security competence. This situation leads to the fact that teachers are defenseless in practice against Internet risks and their inability to protect their students.

The purpose of this article is to scientifically substantiate and experimentally confirm ways to improve the technology of training future teachers for Internet risk prevention.

The objectives of the research are:

– analyze the essence and types of Internet risks in the pedagogical context;

– develop a model for the formation of digital security competence in future teachers;

– create and pilot-test an innovative technology for training for Internet risk prevention;

– analyze the results of the research and develop practical recommendations.

LITERATURE REVIEW

The problem of Internet security and digital risks has been studied by foreign and domestic scientists from various angles. Within the framework of the 'EU Kids Online' project developed by Livingstone and Haddon, the situation of children's exposure to online risks in Europe was studied and four main risk categories were identified: content, communication, behavioral and contractual risks.

Tapscott, in his theory of the digital generation, pointed out the paradox of young people's natural inclination towards technology, coupled with their insufficient critical thinking skills in the online environment. This idea was developed by Buckingham through the concept of 'digital literacy': the ability to use digital technologies does not in itself provide digital security.

Research in this area is also becoming more active in Uzbekistan. Yuldoshev J.G. studied the issues of developing teacher competencies in a digital educational environment. Musurmonov R.M. analyzed the pedagogical conditions for teaching the basics of digital security in preschool and primary education. Shodiev D.Sh. conducted an experiment on the development of a special training module on combating cyber threats in higher education.

However, most of the existing studies either consider digital literacy at a general level, or are focused only on working with schoolchildren. A comprehensive study devoted to the development of a special technology for training future teachers in Internet risk prevention has not yet been carried out.

The European Digital Competence Framework DigComp 2.2 provides a complete list of digital security competencies necessary for future teachers, justifying their division into five main areas: information and media literacy, communication and collaboration, digital content creation, security, problem solving. This model was also used as a methodological basis in our study.

METHODOLOGY

The study was conducted in 2022–2024 at two higher educational institutions training pedagogical personnel in the Tashkent region. A total of 240 students of 3–4 levels participated in the study. In accordance with international standards (IEA ICILS 2018), the groups were equally distributed by specialty, age and gender: 120 formed the experimental group, 120 formed the control group.

The following methods were used in the study:

– Theoretical methods: analysis of scientific literature, comparative analysis, systematic approach;

– Empirical methods: survey, test, pedagogical observation, experimental work;

– Mathematical and statistical methods: Student t-criterion, Pearson correlation coefficient, SPSS 26.0 software.

To assess preparedness for Internet risk prevention, three measurement indicators were established based on the UNESCO ICT-CFT: knowledge level, motivational-value indicator, and practical skills.

Classification of Internet risks

The study developed the following classification of Internet risks for use in the educational context based on the synthesis of the works of Smahel et al. and Kowalski et al.:

Table 1. Pedagogical classification of Internet risks

Risk type	Description	Examples
Content risks	Harmful, objectionable, or inappropriate material	Violence, pornography, extremism
Communication risks	Communication with	Grooming,

	strangers or harmful individuals	cyberbullying, phishing
Behavioral risks	User's actions that are dangerous to themselves or others	Cyberbullying, sharing personal information
Technical risks	Threats to device and data security	Viruses, malware, data theft
Psychological risks	Psycho-emotional problems caused by the Internet	Internet addiction, depression, isolation

PROPOSED TECHNOLOGY

As part of the research, an innovative technology for training future teachers in Internet risk prevention was developed. As Selwyn noted, when designing pedagogical technologies in a digital environment, it is necessary to take into account not only technical, but also social and ethical factors. Based on this principle, the technology was structured in four stages:

I. Motivational-diagnostic stage - At this stage, the existing level of students' knowledge of Internet risks is determined, and educational motivation is formed. Through the simulation game "Digital Life" and case analysis, students demonstrate their experience of real encounters with Internet risks. Duration of the stage: 2 weeks (4 academic hours).

II. Theoretical-methodological stage - at this stage, students acquire theoretical knowledge on the classification, mechanisms and prevention methods of Internet risks. Flipped classroom and blended learning methods are used using materials from the EU Kids Online 2020 study. The module includes: basics of cybersecurity, digital identity and personal data protection, online communication ethics, prevention programs in the school environment. Duration of the stage: 6 weeks (18 academic hours).

III. Practical-project stage - at this stage, students work in groups to develop Internet risk prevention programs for real educational institutions. Taking into account the factors of Internet addiction identified by Helsper and Smahel, each team presents a prevention program adapted for a specific school age. Duration of the stage: 4 weeks (12 academic hours).

IV. Reflective-integration stage - at the final stage, students test their projects in pedagogical practice, analyze their activities and present an improved version. Reflection of the entire educational process is carried out in the form of an e-portfolio. Duration of the stage: 4 weeks (8 academic hours).

Total volume of technology: 16 weeks, 42 academic hours (16 hours of lectures, 26 hours of practical training).

DISCUSSION

When the results obtained are compared with the results of foreign studies, students trained on the basis of our technology showed qualitatively higher results compared to the indicators recorded in the EU Kids Online 2020 study. This difference is probably explained by the wider use of the project approach and elements of real practice in our technology.

If we consider the results of the study in the context of the theory of digital literacy developed by Buckingham and Selwyn, we can see that the constructivist approach used in the developed technology is especially effective in such a constantly changing area as Internet risk prevention.

The following should be noted as limitations of the study: the study was conducted in only two higher education institutions; the long-term impact has not yet been studied. For future research, it is recommended to test the technology in other pedagogical specialties and foreign institutions.

CONCLUSION

This study has shown the need to improve the technology for training future teachers in Internet risk prevention and ways to implement it. The following conclusions can be drawn:

– Internet risks are an integral part of modern pedagogical activity, and future teachers need to form competence in this

area on the basis of a specific technology;

– The developed four-stage technology ensures the simultaneous development of all three components of digital security competence — cognitive, motivational-value and operational-activity;

– The results of experimental and testing work confirmed the high efficiency of the technology: the share of a high level of general competence in the experimental group increased by 4 times;

– The technology can be widely used in higher educational institutions when working with students of pedagogy and psychology.

Practical recommendations: include the subject 'Digital Security and Internet Risk Prevention' as a mandatory subject in pedagogical educational programs; introduce Internet security modules in teacher training courses; Development and dissemination of model prevention programs on Internet safety in schools.

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