Preparing Students to Use Virtual Travel to Develop Preschoolers' Cognitive Interest

Oleksandra Shykyrynska
Faculty Valentyna Voloshyna of Preschool and Primary School Education
Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University
Vinnytsia, Ukraine
o.v.shikirinska@gmail.com

Natalia Pakhalchuk
Faculty Valentyna Voloshyna of Preschool and Primary School Education
Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University,
Vinnytsia, Ukraine
pahalchukn@gmail.com

Kateryna Kolesnik
Faculty Valentyna Voloshyna of Preschool and Primary School Education
Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University,
Vinnytsia, Ukraine
katrinkolesnik1@gmail.com

Tetiana Kryvosheya
Faculty Valentyna Voloshyna of Preschool and Primary School Education
Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University,
Vinnytsia, Ukraine
krivosheja.tatiana@gmail.com

Inna Karuk
Faculty Valentyna Voloshyna of Preschool and Primary School Education
Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University,
Vinnytsia, Ukraine
karuk.i@ukr.net

Abstract-The modern educational space is undergoing significant changes under the influence of digital technologies, which open up new opportunities for teaching and upbringing of children. One of the innovative means of developing the cognitive interest of preschool children is the use of virtual journeys, which allow to broaden the worldview, stimulate curiosity and intensify educational and cognitive activities. The article deals with theoretical and practical aspects of preparing students for the use of virtual travel. The importance of digital technologies in preschool education, their impact on the formation of curiosity and motivation to learn about the world around us is analysed. The key methodological aspects of preparing future teachers for the implementation of virtual excursions, including the choice of content, integration with the educational programme and creation of an interactive educational environment are outlined. Attention is focused on the importance of developing students' digital competence for the effective use of modern educational resources in working with preschool children. An experimental study was conducted, the respondents of which were 67 2nd year students of the bachelor's degree in speciality 012 Preschool Education of Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University, studying under the educational programmes "Preschool Education. Primary Education", "Preschool Education. Speech Therapy" full-time and part-time study programmes. The readiness of future specialists to use virtual travel to develop the cognitive interest of preschoolers is investigated. For this purpose, the relevant criteria were developed and their indicators were determined: motivational (need to use virtual travel; desire for new knowledge in this area); cognitive (knowledge of the peculiarities of using virtual travel to develop the cognitive interest of preschool children); activity (ability to use virtual travel in the educational process). The study revealed mostly medium and low levels of readiness of the students who participated in the survey. The authors of the article provide examples of technologies that should be used in working with students to increase their readiness to use virtual travel in teaching preschoolers: Google Earth and Google Maps – for virtual tours of the world, CoSpaces Edu – for creating interactive media content (virtual reality, augmented reality, interactive 3D content), BYOD technology ("bring your own device") – promotes the integration of mobile learning with other competence-based technologies. The recommendation to reduce the number of applicants with adequate and initial levels of readiness to use virtual travel in the development of cognitive interest of preschool children is to study the relevant elective discipline.

Keywords: cognitive interest, preschool children, virtual travel, student training.

I. INTRODUCTION

An analysis of the scientific literature has revealed the importance of integrating virtual journeys into teacher

training, which helps future teachers develop the skills of using VR technologies to stimulate children's cognitive interest [14].

Research shows that the use of VR excursions not only improves the educational process, but also promotes creative thinking and interest in learning, which is especially relevant for working with preschoolers [12]. In addition, the analysis emphasises the need to choose the right software and tools to create effective virtual journeys, which optimises the learning process and increases its interactivity [13].

The study by Smith et al. demonstrates the effectiveness of using virtual tours (IVR) in teaching social sciences, which is confirmed by a comparative analysis of the results of the experimental and control groups of students. The proposed methodology includes the development of training sessions in a virtual environment, which contributes to increasing students' cognitive interest through interactive immersion in historical events and cultural context. The analysis of the results of the post-test evaluation revealed a significant advantage of students who studied with the help of IVR in understanding and memorising the material, which indicates the effectiveness of this method for the development of cognitive skills.

The study by Rapti, Sapounidis and Tselegkaridis confirms that the use of VR technologies in teaching preschoolers arouses significant interest and enthusiasm among children, which can contribute to the development of their cognitive interest. At the same time, the authors note that VR activities do not always promote cooperation between children, which is an important aspect of preparing students for the effective use of this technology in working with preschoolers. Therefore, the training of future teachers should include strategies for using VR not only to engage children but also to develop their communication and interaction in a group.

The research of Andersen, Makransky and Mayer demonstrates that the use of conceptual models such as BEM allows for a deeper analysis of the interaction between the individual and the digital environment, which is important for the development of effective virtual journeys in preschools. The authors concluded that the use of head-mounted displays stimulates interest in science, which confirms the feasibility of integrating VR technologies into the training of students to work with preschoolers.

Alan Ü. (2023) analyses the impact of virtual field trips (VFTs) on children's early education and interaction with their families, confirming the positive effects on emotional well-being, knowledge acquisition and behavioural development. The author emphasises the importance of good planning and expert involvement, while acknowledging that VFTs cannot fully replace traditional field trips due to the limited possibility of multisensory experience.

Research has shown that the use of virtual travel can increase cognitive interest and interactivity in learning, particularly in the context of climate change and alternatives to traditional field trips [15; 22; 10]. However, it is important to integrate these technologies properly to achieve maximum effect in the educational [9; 18; 4; 8].

The following approaches and technologies for forming the ability of future specialists in preschool and primary education to form the basics of cybersecurity of children of preschool and primary school age are highlighted: problem-based approach, BYOD technology ("bring your own device"), and the method of "flipped learning" [20].

Studies show that the use of virtual tours is an effective tool for developing preschoolers cognitive interest, as well as stimulating their creative thinking through interactive teaching methods. This is emphasised in studies where virtual trips have proven to be useful in increasing children's engagement in the learning process [5; 11]. At the same time, for the successful integration of VR technologies into pedagogical practice, it is important to properly prepare students for the effective use of these tools, in particular, by teaching them how to select and implement appropriate VR resources for working with preschoolers [6; 21].

II. MATERIALS AND METHODS

In the course of the study, we used the following methods: theoretical: the method of analysis and synthesis of scientific data in order to determine the theoretical foundations of the problem of future specialists' readiness to use virtual travel to develop the cognitive interest of preschoolers, synthesis, systematisation and generalisation of theoretical provisions of the problem; empirical: interviews with students about the ability to use virtual travel in the educational process, questionnaires of future specialists in preschool education of Vinnytsia State Pedagogical University.

III. RESULTS AND DISCUSSION

An experimental study was conducted, the respondents of which were 67 2nd year applicants for a bachelor's degree in speciality 012 Preschool Education of Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University, studying under the educational programmes "Preschool Education. Primary Education", "Preschool Education. Speech Therapy" full-time and part-time students. We studied the readiness of future specialists to use virtual travel to develop the cognitive interest of preschool children. To do this, we developed appropriate criteria and defined their indicators: motivational (need to use virtual travel; desire for new knowledge in the field of); cognitive (knowledge about the features of using virtual travel); activity (ability to use virtual travel in the educational process).

The article also characterises three levels of readiness of future specialists in preschool and primary education to use virtual travel to develop the cognitive interest of preschool children.

High – expressed motivation for continuous self-development and improvement in the use of virtual journeys in the development of children's cognitive interest, readiness to implement advanced pedagogical approaches; in-depth knowledge of digital tools, platforms, resources for virtual journeys; profound skills in applying digital tools, platforms, resources for virtual journeys to develop the cognitive interest of preschool children.

Adequate – growing awareness of the importance of professional and personal development in the field of developing the cognitive interest of preschool children through virtual travel, adequate attitude to the teacher's wishes to take more initiative to expand knowledge in the field of virtual travel; knowledge of digital tools, platforms, resources for virtual travel; ability to apply digital tools, platforms, resources for virtual travel to develop the cognitive interest of preschool children.

Initial – insufficient understanding of the importance of professional and personal development in the field of developing the cognitive interest of preschool children through virtual travel, adequate attitude to the teacher's wishes to take more initiative to expand knowledge in the field of virtual travel; basic knowledge of the theoretical foundations of digital tools, platforms, resources for virtual travel; limited readiness to use knowledge in practice.

The respondents were offered a Google Forms survey that included three sets of questions (13 questions in total), according to the criteria identified. The survey was completed by 67 full-time and part-time students.

The first question of the questionnaire was informative and did not relate to any criterion (Are you familiar with the concept of "virtual travel"?) Respondents were offered the following options: yes, familiar, partially familiar, no, not familiar. Among the applicants who took the survey, 25 are familiar with the concept of "virtual travel", 28 are partially familiar and 14 are not familiar.

To find out the levels of students' readiness to use virtual excursions with preschoolers according to the motivational criterion, we used three questions covering the relevance of using virtual excursions by preschool teachers in martial law, the importance of self-education of future teachers in the use of virtual excursions to form the cognitive interest of preschoolers, and the names of courses attended by students for self-education. Let us dwell on the analysis of students' answers in more detail.

The first question was: "In your opinion, how relevant is the use of virtual excursions in shaping the cognitive interest of Ukrainian preschool children under martial law? Please justify your answer (in one sentence)". When analysing the respondents answers to this question, we paid attention to their awareness of the relevance of using virtual tours in Ukrainian preschool education institutions. If the student named at least two reasons, the level of relevance was high, one was sufficient, and if no reason was named or the answers were unambiguous (for example, "relevant"), the level was initial. It is worth noting that the number of reasons was not the only criterion for dividing students into levels. We also assessed the content and depth of the answer. Here are examples of students' responses that we considered to be of a high level: "the use of virtual tours is extremely relevant, as they facilitate access to quality educational content even in conditions of limited physical mobility and safety", "unfortunately, real tours are not possible at the moment, but they are part of preschool education, for better development and knowledge of the environment. Therefore, it is possible to use virtual excursions, which are not much inferior to real excursions", "in the conditions of martial law, the use of virtual excursions is relevant, as they safely and affordably contribute to the formation of cognitive interest in preschool children, providing them with the opportunity to get acquainted with the culture and world even in difficult circumstances", "the use of virtual trips is relevant, as it is difficult to fully provide preschool children with real trips in the conditions of martial law, especially in the border areas" and "in my opinion, in the context of martial law, the use of virtual tours is extremely relevant, as they provide access to educational materials, stimulate cognitive interest and broaden children's horizons while remaining safe and accessible", "the cognitive interest of a modern preschooler is successfully realised through the organisation of virtual tours, increases motivation to learn, forms an active personal position in the world around them", "virtual tours are extremely relevant as they allow children to safely get acquainted with the world around them". There were 18 such answers.

If the applicant mentioned only one argument for the relevance of virtual travel with preschoolers in wartime and the content of the answers was not as deep and meaningful, we considered it to be of a sufficient level. Here are examples of such answers: "Virtual trips interest children, make them want to see cities and nature in real time", "virtual trips improve the emotional and mental state of children", "the use of virtual tours is extremely relevant because they provide safe access to cultural, natural and scientific sites". There were 23 such students.

If the applicant did not indicate any or the reason was insignificant or formal, the level was initial. Also, students whose answer was formal were classified as initial-level. For example: "I believe that the use of

virtual excursions is a relevant tool for the formation of cognitive interest in preschool children". There were 26 such students.

The second question in the motivational block was the following: "How important is it for a teacher to engage in self-education in the use of virtual travel in shaping the cognitive interest of preschool children? Justify your opinion. Please give at least two reasons for your opinion". When analysing the answers of the students who took part in the survey, we noticed that there were few reasoned answers. Most of the students said that it was necessary for educators to engage in self-education in the field of virtual travel, but they did not give any arguments. Here are some of the answers: "self-development is important in any profession", "self-development is the improvement of knowledge. To be interested in a topic, you need to have this information", "I believe that educators and every person who will work in the kindergarten should engage in self-education – it is important".

Here are some well-reasoned answers, in our opinion: "the relevance of teaching methods: modern technologies are constantly changing, and the educator must have up-to-date knowledge to effectively use virtual trips", "educator self-education affects the quality of learning: awareness of new tools allows creating interesting, interactive and accessible forms of learning for children", "improving educator self-education affects children's motivation: virtual excursions, if properly organised, stimulate interest in learning, forming a desire to explore the world", "educator self-education is a good way to improve the quality of learning". It allows to make preschoolers education more effective, interesting and individualised.

The following answers to this question were somewhat formal and shallow: "improving the quality of the educational process", "increasing children's motivation to learn", "developing children's creative abilities", "forming children's sustainable cognitive interest". We attributed such answers to adequate level of student's motivation in using virtual travel to develop preschoolers cognitive interest. The following answer: "educator's self-education in the field of using virtual tours is extremely important, especially in the context of developing cognitive interest in preschoolers. Here are some reasons why this is important: continuous development of technological skills, expansion of methodological approaches, formation of cognitive interest in children, adaptation to changing conditions, ensuring the safety of children in the digital environment, development of professional competence" was classified as a beginner level. In general, the students' answers to this question were distributed as follows: high – 15, adequate – 18, initial – 34.

In order to find out whether future specialists use the above arguments in their own lives, we proposed the

second question: "What courses have you taken in the last six months on the use of virtual travel in the educational process of preschool education?" If the respondent named at least two courses, it was a high level, if one – adequate, if none – initial. The following results were obtained: 15 students – high level, 37 – adequate, 43 – initial.

Based on the results of three questions, we can determine the levels of readiness of future specialists in preschool and primary education according to the motivational criterion: high – 17, adequate – 41, initial – 37.

The next block of questions was aimed at identifying the levels of readiness of future specialists in preschool and primary education to form the cognitive interest of preschool children according to the cognitive criterion. There were three questions in this block in total. The first question was as follows: "What aspects of children's development, in your opinion, are most influenced by virtual travel?" *(Select all that apply). Students' answers were distributed as follows:* cognitive interest – 70, imagination and creativity – 58, broadening of horizons – 60, communication skills – 40. Respondents were also asked to provide their own answers. We did not record any such answers. Since students could choose several options when answering this question, the total result is different from 100%. Based on the results of this question, we received the following levels: high – 21 students, adequate – 24 students, and initial – 22 students.

By offering the students the following question, we planned to obtain a methodological level of knowledge of the algorithm of using virtual journeys to develop the cognitive interest of preschool children. The question was as follows: "Choose the correct option, which indicates the sequence of actions of the educator for the effective conduct of a virtual journey. 1. Formulate the goal and objectives of the virtual journey; 2. Prepare technical means or ask parents if they have the appropriate means at home (in case of remote interaction). 3. Conduct the trip. 4. Provide pedagogical support for the virtual journey. 5. Choose a virtual journey; 6. Analyse the effectiveness of the virtual journey". The following algorithm was correct: 152346. We classified the students who chose the correct algorithm of actions as high level, the students who chose a sufficient algorithm, albeit incorrect, but with 1-2 mistakes, as initial level – such answers, logic and sequence of stages of using virtual journeys are absent or the student did not answer this question at all. The students' levels for this question were distributed as follows: high – 20, adequate – 23, initial – 24.

The next question was aimed at finding out students' knowledge of the technical means of conducting virtual travel. Students could choose several options. The options were as follows: interactive whiteboards – 58,

computers/laptops – 56, tablets 36, VR glasses 52. Students were also offered to write down their own answer. We did not notice any such options. We classified students who chose all the options offered as high, three out of five as sufficient, and two or none as beginner. The students' levels in this question were distributed as follows: high – 31, adequate – 29, and initial – 7. As we can see, the students who took part in the survey are aware of the technical means that can be used to conduct a virtual journey with preschoolers.

Based on the results of three questions, we can determine the levels of readiness of future specialists in preschool and primary education according to the cognitive criterion: high – 17, adequate – 41, initial – 37.

To determine the levels of readiness of future preschool education specialists to use virtual travel according to the activity criterion, we offered students two questions. Let us analyse the students' answers.

First question. Watch the video. Write 3-5 questions that you would ask children after they have watched this virtual tour of Ukraine to develop their curiosity(https://www.youtube.com/watch?v=o1kRNXRINTY).

If the questions that the educator asks the children after watching the virtual journey are reproductive in nature, such as what did you see in the video? Would you like to go there? Have you ever been to such places? – initial level. If the questions were of a problematic nature, for example: What new animals or plants did you see? What interesting places do you remember from our trip? Why do you think these places are important for our country? What impressed you most about this trip? Would you like to visit one of these places in real life? Why? What new facts did you learn about Ukraine? What was most interesting? Why? If you answered yes, this is a sufficient level. If the answer contained both reproductive and problematic questions, it is sufficient. The results are as follows: high – 14, adequate – 27, initial – 26.

The second question of the activity criterion: Watch the video. What changes would you make to the video to make it more conducive to the development of preschoolers cognitive interest? (https://www.youtube.com/watch?v=yeMdjcacQ2M). The video offered to students contains a trip around the world. Let's analyse the students answers. If the student's answer was constructive and meaningful, this is a high level. For example: "For a more favourable development of preschoolers, I would replace the background of the video with brighter pictures and add animation. To introduce the globe, I would put a picture of a rotating globe. To study European countries, I would first introduce children to Europe, tell them about it and then about its countries. I would insert a map with clearly marked borders, more interesting information about the countries, pictures of animals that live there, people, their clothes, traditions, etc.", "In my opinion, this is more of an informative story than a virtual journey. I think it would be necessary to plot the route on a world map so that children understand where a particular country is located. I would also add video fragments about each country so that children could see the peculiarities of each country", "Add more interactive moments (questions, tasks for children). Use more colourful visual effects. Add game or animation elements. I would add video fragments, more interesting material and improve public speaking skills".

If the answer to this question was less thorough (for example: "Add interactive elements, such as questions or tasks that children can do while watching", "use colourful graphics and animation to enhance the visual experience", "include an interesting narration by a character who accompanies children on the journey", "show more real-life examples that children can recognise or relate to", "focus on emotional moments that evoke surprise or admiration, such as unique natural phenomena or unusual buildings"). If there was no answer to this question or it was not independent, the level was initial. The results are as follows: high – 16, adequate – 29, initial – 22.

Based on the results of two questions, we can determine the levels of readiness of future specialists in preschool and primary education according to the activity criterion: high – 15, adequate – 28, initial – 24. The generalised data can be seen in Table 1.

TABLE 1.LEVELS

	high	sufficient	low
motivational	16	26	25
cognitive	24	25	18
operating	15	20	24

We also conducted interviews with students to provide more detailed answers to certain questions in the questionnaire. The results of the interview confirmed the results of the questionnaire. During the conversation, students shared their thoughts that they were interested in the use of virtual travel in the educational process of preschool education and would like to gain additional knowledge on this issue, for example, in an elective course. If there is no such opportunity, they plan to engage in self-education in the use of virtual journeys to form the cognitive interest of preschool children.

In conclusion, here are examples of resources and technologies that should be used in working with students to increase their readiness to use virtual travel in developing preschoolers cognitive interest: Google Earth and Google Maps – for virtual tours of the world, CoSpaces Edu – for creating interactive media content (virtual reality, augmented reality, interactive 3D content), BYOD technology ("bring your own device") –

promotes the integration of mobile learning with other competence-based technologies. In our opinion, it will be extremely interesting for preschoolers to make a virtual trip to other planets, as such a trip is impossible in real time.

In particular, you can take a trip to Mars, recorded by the Curiosity rover, at the following link: https://accessmars.withgoogle.com/#. It will also be interesting for preschoolers to visit Ukrainian open-air museums: https://museums.authenticukraine.com.ua/ua/, using the Google Arts & Culture digital platform, you can travel to 17 museums around the world (https://artsandculture.google.com/), the Georgia Aquarium, you can watch penguins, piranhas or exotic jellyfish via a web camera by visiting the largest oceanarium in Atlanta, USA (https://www.georgiaaquarium.org/webcam/ocean-voyager/), you can see picturesque panoramas created thanks to tens of thousands of photos from around the world on the 360cities.net Panorama platform (https://www.360cities.net/).

IV. ACKNOWLEDGMENTS

V. CONCLUSIONS

Preparing students to use virtual travel in their work with preschoolers is an important and promising area of teacher education. Mastering this tool contributes to the development of digital competence of future teachers, helps to create interesting and interactive lessons that increase the level of cognitive interest of children.

The main characteristics of a virtual journey are the organisation of remote communication between participants in the educational process, time management for learning, mobility and accessibility, and stimulation of creativity in educators and children.

The results of the study showed that the effective use of virtual journeys in the educational process of preschool education institutions requires students to master modern digital technologies and online resources; methodological skills for integrating virtual journeys into various educational areas; understanding the age characteristics of preschoolers to create meaningful and accessible journeys.

The following technologies should be used in working with students to increase their readiness to use virtual travel in teaching preschoolers: Google Earth and Google Maps, CoSpaces Edu, BYOD technology.

The research conducted does not cover all aspects of the problem under consideration. Further research is needed to study the possibilities of combining virtual travel with other interactive teaching methods and to develop methodological recommendations for teachers on the optimal use of this tool in the educational process.

In the article, the authors made an attempt to actualize the problem of the readiness of future preschool and primary education specialists to form the foundations of children's cyber security. In connection with the increase of threats on the Internet and the use of gadgets by children from an early age, it is necessary to develop children's ability to use the Internet safely, to be conscious citizens of the digital world. For this, it is necessary to train future specialists in preschool and primary education.

The following approaches and technologies for the formation of future specialists of preschool and primary education in the ability to form the basics of cyber security of children of preschool and primary school age are singled out: problem-based approach, BYOD technology ("bring your own device"), the method of "inverted learning".

The conducted research does not cover all aspects of the problem under consideration. The question of forming the motivation of preschool and primary education specialists for independent continuous professional development in the field of cyber security requires further research.

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