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VIRTUAL MUSEUM TECHNOLOGIES IN THE DEVELOPMENT
OF RESEARCH ACTIVITIES IN SCHOOLCHILDREN

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Abstract

Virtual museum technologies can be used by teachers for various purposes: communicative, cultural and educational, teaching, motivational and research. The combination of information technology, museum pedagogy and the project method provides ample opportunities for developing abilities in schoolchildren of all ages. Today, there is a trend to the implementation of virtual museum pedagogy in educational practices, including research activities of schoolchildren. The urgency of this process is obvious. The virtual museum technologies allow you to develop various types of lessons: problematic (creating a problem situation), individual (independent search and cognitive activities), group creative tasks, travel lessons, excursions, competitive-game programs. All of them are aimed at awakening the student's interest and research activity. Virtual museum pedagogy is a promising direction, innovative pedagogical technology. Rapidly developing information technologies and mass media are shaping new models of socio-cultural objects, including virtual museums. Museums and schools can be interacted through the development of research activity in children. This should be various activities aimed at the solution of creative, research problems in science, technology, art. This work should contribute to the development of research thinking, which makes it possible to develop cognitive interests, independence, and a culture of educational work; systematize, generalize, deepen and apply knowledge. To perform such activities, it is necessary to use museum exhibitions; in the context of distance learning, the use of virtual museum technologies is especially important.

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1. Introduction

New reality dictates the need to search for relevant ways of productive learning; information technologies have a huge impact on educational and socio-cultural processes, and have become an obligatory part of them. Due to electronic technology and the Internet, each student has an access to culture; the development of self-expression is open; teachers are improving methods and techniques using new educational opportunities.

In 2015, the government of the Russian Federation updated a number of regulations governing the state policy in education. An important part of the Strategy is the "involvement of children in the cultural heritage", which, among other things, involves:

- effective use of the unique Russian cultural heritage;
- an equal access of all children to cultural values;
- availability of museum and theatrical culture for children;
- development of museum and theatrical pedagogy.

Thus, the priority area is the involvement of various social institutions in the process of educating schoolchildren. Museums possessing theoretical research and practical opportunities are becoming one of the most active participants in this process.

2. Problem Statement

The importance of the role of the museum in the personality development is emphasized by Boyko, Vdovina, Karpukhina, Kossova, Matskevich, Stolyarov and others. Museums preserve the cultural and historical heritage, and develop interest in national history in the new generation, generate emotional attachment to the social and ethnocultural environment, customs, traditions, etc.; show universal values; contribute to the prevention of the spiritual crisis of society, "preserving and broadcasting the spiritual heritage in the form of museum items; they are a place where conditions for self-learning and self-development are created, contributing to the formation of beliefs and personal experience" (Butenko, 2013, p. 62). Many teachers (Ushinsky, Kapterev, Blonsky, Shatsky) argued that the "museum pedagogy" allows us to broadcast the spiritual and cultural experience accumulated by mankind. Therefore, the relevance of virtual museums in the learning process is due to "the need to raise the cognitive interest and activity of students, to stimulate them to study the subject, to bring the learning process closer to the students' needs in using information technologies" (Astafieva, 2013, p. 32).

In addition, according to Biktagirova and Biktagirova (2012), the educational process based on modern forms that are in demand in children and youth, such as virtual museums, helps to increase the motivation for the participation in socially significant project and research activities. Therefore, the intensification of research activities of students must begin with the use of virtual museums in the trajectory of individual development.

3. Research Questions

The “virtual museum” model differs from the classical variants of full-time interaction between students and museums; it is realized only with the help of information technologies. This fact plays an engaging role, acting as a game mechanism in the development of research activity, since specially designed portals, Internet resources or applications for smartphones have become means of interaction, and new unique technologies and methods of museum pedagogy are being developed.

According to Dziuba (2016), there are various options for virtual museums:

- content-oriented museums (search and display of content);
- communication-oriented museums (context-based communication);
- collaborative museums (dissemination of ideas and resources).

Virtual museums of the first type are most relevant for school education, since the paradigm of a content-oriented virtual museum is a platform for the learning space.

Maksimova (2012) has developed several classifications of museums:

- 1) by locality: national; international.
- 2) by functionality: performing only information and cognitive functions; communicative: having forums, feedback, Skype; economic: having stores; educational: availability of any pedagogical resources; accessibility for people with disabilities.
- 3) by the availability of services: open: any user can add exhibits; semi-open: other museums or only the owner of the virtual museum can add exhibits; closed: available to a narrow circle of users (e.g., virtual museums of corporations).
- 4) By age: targeted at an adult audience (usually erotic); family, intended for a wide audience; children's museums.
- 5) by goals: educational; commercial; socio-political.

There are virtual excursions in many museums; however, in the context of the distance learning, they have become the key to develop research skills in schoolchildren. Art museums (the Russian Museum, the Tretyakov Gallery, the Hermitage, the Pushkin Museum of Fine Arts, the Grigoriev Art and History Museum in Kozmodemyansk, Krasnoyarsk Art Museum n.a. Surikov), museum reserves (Kremlin, Peterhof, the Naryn-kala fortress, the Malye Korely Museum of Wooden Architecture, the Museum of Merchant Life in Kozmodemyansk, etc.), ethnographic museums (the Peter the Great Museum of Anthropology and Ethnography of the Russian Academy of Sciences (Kunskamera), the Russian Ethnographic Museum), the Darwin Museum, military museums, museums of technology allow the teacher to organize research work in many academic disciplines.

It is important to apply psychological knowledge in order to implement various activities. Research work performed in the traditional form or using innovative means should be systematic. "The principle of consistency of consciousness and periodization of the development of children are extremely important for establishing age-related learning opportunities" (Kravtsov & Kravtsova, 2020, p. 5). Purposeful and systematic research activities can develop research interest, a desire to feel like a full-fledged and serious scientist. It is desirable for the teacher to set tasks, choose an individual trajectory for the development of research behavior. Moreover, the development of a teacher should be systemic:

teachers understand the importance of comprehensive development and strive to obtain as much knowledge as possible to communicate it to their students (Hanleya & Thompson, 2021).

Many virtual museums have a variety of feedback tools that can foster research and other activities. For example, some online museums feature quizzes, tests, laboratories, 3D walk quests, simulation forms, games. "In the scientific literature there are few studies on the developmental effects of computer games in relation to creativity" (Margolis, 2020).

4. Purpose of the Study

The article aims to present possibilities of using the virtual museum in the development of research activity in middle and high school students in the classroom, independently, in extracurricular activities, etc.

5. Research Methods

The study aims to identify and describe the main functions of a virtual museum used as a method in educational activities. For this purpose, the following methods were applied: the descriptive method used to show the possibilities of using a virtual museum in various educational activities; the typological method that helps to see the possibilities of a virtual museum in research activities; the comparative method that allows you to present positive aspects of virtual, innovative technologies; the methods of analysis and synthesis contributing to the development of conclusions and further research prospects.

6. Findings

One of the research activities is project work, therefore, there is an increase in interest in the model "museum exhibit in project work". Thus, "psychological design knowledge is construction of an image of a possible and desired person and conditions for achieving it. Practical and methodological knowledge helps a person to change himself, acts as a means of self-improvement" (Isaev, 2020). Due to the advantages of virtual museum technologies (access to educational Internet resources is free of charge, around the clock, you only need a smartphone or a computer), such activities create no difficulties for schoolchildren.

For example, the course of literature in middle and high schools includes works of foreign authors, which mention paintings, sculptures presented only in foreign museums. Students can be encouraged to carry out research that analyzes art works by visiting virtual museums; this will allow for a deeper analysis of the text. Extravagant and quirky museums can also help spur research into literature classes. The specificity of studying literary texts is the teacher's explanation of unfamiliar words and realities unfamiliar to schoolchildren. For example, when studying works written in the Soviet period, there is a unique opportunity to plunge into the thick of the communal life of St. Petersburg; it is enough to visit the virtual museum "Communal Apartment". For astronomy lessons, you can offer schoolchildren projects related to virtual excursions on the surface of Mars or exhibits of Moscow Planetarium; in history lessons, schoolchildren can visit virtual national museums of the countries under study; in geography lessons, you can develop projects involving online excursions to iconic historical and cultural sites.

The virtual museum has great opportunities in conducting an ACW lesson. This technology makes it possible to compose the desired exposition, choose the route; it becomes possible to learn the material at home, which contributes to the more complete knowledge of the topic and allows students to assimilate the material. The creative nature of homework arouses high cognitive interest in students and raises the general cultural level.

Thanks to virtual museums, it is possible to avoid significant disadvantages of ACW lesson: listing a large number of works; loss of interactive opportunities (Maksimova, 2012). This format attracts those interested in a deeper acquaintance with the material presented in museums, contributes to the formation of sustainable cognitive interest.

Since research means writing a scientific work and obtaining collecting information, the educational portal "Hello Museum", which contains museum lessons, educational videos, quizzes, interactive applications, can stimulate this activity. The similar function can be performed by the multimedia "Russian Museum. Guide for Children" program which is a virtual tour of the Mikhailovsky Palace for children aged 5–12.

The lesson in the form of an excursion seems relevant as a solution to the problem of developing research activity. This form is convenient for distance learning and full-time learning. The student should study museum exhibits and prepare the excursion route. Taking part in the development of projects of virtual excursions, students expand their knowledge gained during lessons, master research techniques and methods.

The regional component in school education allows for the implementation of virtual museum projects focused on immersing schoolchildren in key features of the regions where they live. Classes based on virtual excursions arouse the interest in the homeland, foster patriotism, create conditions for independent research activities through the effective use of information and communication technologies, and increase the motivation to participate in familiarizing with the cultural heritage.

Students' independent research work can be organized using the resources of virtual museums. The teacher divides students into thematic groups, sets tasks and involves students in collecting information. "Creative tasks using the means of virtual museums help to develop educational skills: selection of materials, comparative analysis, grouping of materials, public presentation of research results" (Shcherbakova, 2012).

The potential of virtual museum technologies in research activities is enormous. The scope of such activities is expanding; there are more opportunities for an individual approach to each student and creative directions of such activities. In addition to the already created and freely available virtual museums, the teacher can create his own virtual exposition in the form of presentations.

7. Conclusion

Activities of students in the virtual educational environment, in particular in virtual museums, are important for gaining knowledge in order to form a harmoniously developed personality and enhancing research skills. Research work has developing, educational, patriotic, communicative, cultural and educational, teaching, motivational opportunities, stimulates the skills of independent work. The information and educational environment based on modern computer and telecommunication

technologies do not limit schools as a place of interaction, while the working time also becomes stretched: students can interact with teachers, classmates, employees of museums, archives in a distance format, which contributes to the open networking. Indeed, teachers who improve their digital competencies become mentors, co-authors of their students, which is in line with the current socio-pedagogical scenario (Meroñoa et al., 2021; Ryhtä, 2020). Such interaction based on the continuous research interest will certainly allow us to educate interested, serious and harmoniously developed research scientists.

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