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DEVELOPING STUDENTS' HISTORICAL THINKING THROUGH MULTIMEDIA TOOLS: COGNITIVE IMPACT

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Abstract: Historical thinking is defined as the ability of students to analyze, compare, and connect historical events. This article scientifically analyzes the impact of multimedia tools on the development of historical thinking in students. The process of developing students' historical thinking includes cognitive processes such as memory, critical thinking, analysis, and creative thinking. The impact of multimedia tools (such as videos, animations, interactive maps, and virtual reality (VR) technologies) on these processes is demonstrated. Based on cognitive development theory, the article explores how multimedia tools change the way students acquire knowledge, how they receive, store, and process information. The role of multimedia tools in developing students' historical thinking skills and how they can enhance students' cognitive abilities is analyzed. The article also includes methods and methodologies for measuring the cognitive impact of multimedia tools on historical thinking. This helps ensure the application of effective methods in developing critical and creative thinking skills in students. The article aims to provide scientifically grounded recommendations on how to measure the cognitive impact of multimedia tools in the development of historical thinking and how they should be applied in pedagogical practice. By expanding the cognitive impact of multimedia tools in the education system and demonstrating effective ways to apply them, the article contributes to further developing students' thinking abilities.

Keywords: Multimedia tools, cognitive development, innovative technologies, pedagogical technologies, assimilation, accommodation, interactive maps, cognitive impact

Introduction: The modern education system places great emphasis on developing students' historical thinking, as it helps cultivate critical thinking, analysis, and the ability to connect historical events. Historical thinking encompasses not only memorizing historical events but also the ability to analyze, evaluate, and interrelate them. One of the primary goals of modern educational methods is to create opportunities for students to understand history more deeply and view it from various perspectives. In this process, multimedia tools have become one of the most important means of enhancing the effectiveness of the learning process. Multimedia tools (video, audio, animation, interactive maps, 3D models, virtual reality, and augmented reality) serve as effective aids in helping students assimilate information and develop historical thinking. These tools enable students to learn historical events not only through text but also interactively. Furthermore, through multimedia tools, students learn to connect historical processes and engage in critical thinking about them. According to Piaget's theory of cognitive

development, students develop by either assimilating new knowledge into their existing frameworks or accommodating it by adjusting their existing knowledge structures. Multimedia tools activate these processes, helping students to learn more effectively and interactively. From the perspective of cognitive psychology, multimedia tools affect cognitive processes such as memory, attention, critical thinking, analysis, and creative thinking. These processes, in turn, play a crucial role in shaping students' historical thinking. Additionally, multimedia tools ensure active participation in the learning process, which enhances students' motivation and helps them gain a deeper understanding of historical events and processes. The aim of this thesis is to scientifically analyze the cognitive impact of multimedia tools and their role and effectiveness in developing students' historical thinking. The thesis will examine the methodologies, experiments, and international experiences used to measure the impact of multimedia tools on developing historical thinking, highlighting the important approaches applied in enhancing students' cognitive skills, and analyzing the changes in students' learning processes.

Based on international experiences, the effectiveness of integrating multimedia tools into the educational process will be analyzed, including successful practices in Scandinavian countries, the USA, and Asian nations. The thesis will discuss how multimedia tools assist students in studying historical events and the pedagogical significance of their cognitive impact.

Cognitive Impact of Multimedia Tools on Students' Cognitive Development. Cognitive development is the process by which individuals learn from their experiences, process information, and make decisions based on that information. This process includes various cognitive activities such as memory, attention, analysis, decision-making, problem-solving, and thinking. The cognitive development of students refers to how these processes evolve within the educational process. Multimedia tools (videos, audio, interactive maps, 3D models, virtual reality) have a significant impact on these processes and help students effectively learn, understand, think, and retain information.

Jean Piaget, the founder of cognitive development theory, made significant contributions to the study of human cognitive development. According to Piaget's theory, the development of thought occurs through the resolution of problems faced during growth and new experiences. Piaget referred to this process as cognitive constructivism, meaning that children actively construct and update their knowledge during the learning process. According to Piaget's theory of education and knowledge acquisition, learning is a continuous process where new knowledge is assimilated and existing knowledge is improved.

The cognitive development of students, in relation to the subject being learned, including history, involves not only memorization but also analysis and understanding. Multimedia tools activate this process, allowing students to easily and effectively learn new and advanced information. Multimedia tools positively impact cognitive processes such as memory and attention. Through videos and animations, students can view historical events in a realistic manner, which helps strengthen their memory. Interactive

maps and 3D models allow students to see the connections between historical processes, enabling them to not only memorize events but also understand them in context. According to Piaget's theory of cognitive development, this process occurs through assimilation and accommodation, as students link new information with existing knowledge and apply new approaches to assimilate it.

Critical thinking and creative thinking Multimedia tools help develop not only memory and attention but also students' critical thinking and creative thinking skills. Critical thinking enables students to analyze historical events, understand cause-and-effect relationships, and develop a critical approach. Creative thinking, on the other hand, helps students generate new perspectives and ideas about historical processes. For example, with virtual reality (VR) technologies, students can see historical events with their own eyes. This helps students not only learn history but also actively participate in its creation. With VR, students can feel as though they are participating in historical events, which further enhances their creative thinking. Through interactive maps, students can explore the connections between historical events and regions, allowing them to think from new perspectives.

Strengthening memory, attention, and focus Another important effect of multimedia tools is their impact on strengthening students' memory and attention. According to Piaget's cognitive theory, when students assimilate new information, they develop not only practical skills but also the ability to remember and process that information. Through video materials and animations, students remember historical events better, as they are presented not only through text but also through visual and auditory materials. These tools enrich students' historical thinking, help strengthen their memory, which, in turn, increases the effectiveness of the learning process. Experiments conducted to measure the cognitive impact of multimedia tools showed changes in students' learning processes. For example, when students were tasked with learning historical events using multimedia tools, the results showed changes in their critical thinking and analytical abilities.

International Experience: The Use of Multimedia Tools in Education in Scandinavian Countries In Scandinavian countries, particularly Sweden and Norway, the use of multimedia tools in education plays a significant role in the development of historical thinking. In these countries, the education system actively incorporates not only traditional teaching methods but also innovative technologies in studying history. Multimedia tools, especially virtual tours, interactive maps, and 3D models, provide students with the opportunity to learn historical events and processes in a new and interactive way. These methods allow students to not only memorize information but also view and assimilate it in real-time and in various contexts. Through virtual tours, students can visit historical sites, ancient cities, and architectural monuments, as well as analyze these sites from different perspectives alongside their teachers. For example, in Sweden, students use virtual tours to study the history of the Vikings, which helps them gain a deeper understanding of the daily life, social structure, and worldview of the Viking era.

With interactive maps, students can analyze historical events not just from a geographical perspective, but also within the context of historical processes and changes over time. For example, in Norway, students use interactive maps to trace migration routes from the 19th century when Norwegians had connections with North America, which enriches their historical thinking. With the help of 3D models, students are given the opportunity to interactively view and analyze ancient cities and monuments. In Sweden and Norway, these methods allow students to explore historical buildings, architectural landmarks, and ancient structures in 3D format, which aids in a broader and deeper understanding of historical thinking. For instance, students can view the Pyramids and other ancient Egyptian monuments through 3D models, helping them understand not only their physical forms but also their social, political, and religious significance.

The use of multimedia tools in education in Sweden and Norway enhances students' cognitive skills, as they not only study history visually, but also develop their ability to analyze, compare, and evaluate historical events through interactive and virtual tools. This strengthens their critical thinking, creative thinking, and problem-solving skills, enriches their historical thinking, and provides them with a new and broader perspective on historical processes. This experience can also serve as a model for developing countries like Uzbekistan. By effectively integrating multimedia tools into the education system, historical thinking can be developed, students' thinking abilities can be enhanced, and the learning process can become more interactive. In this way, students will be ready not only to memorize their history but also to study it more deeply and apply it in practice.

Conclusion: The cognitive impact of multimedia tools on developing students' historical thinking has been analyzed in depth. Historical thinking plays a crucial role in shaping students' abilities to analyze, compare, and interconnect historical events. The use of multimedia tools in the educational system not only creates opportunities for learning history but also for learning it interactively. Through the use of video, animation, interactive maps, 3D models, and virtual reality (VR) technologies, students are able to study historical events in an active, visual, and interactive way, which effectively supports their cognitive development. Based on Piaget's theory of cognitive development, multimedia tools activate students' processes of assimilation and accommodation, allowing them to assimilate new knowledge and update their existing knowledge. Multimedia tools are significant in developing cognitive skills such as critical thinking, creative thinking, memory, and attention. Students are able not only to memorize historical events but also to create new perspectives on them and approach them critically. In Scandinavian countries like Sweden and Norway, the use of multimedia tools in education enriches students' historical thinking and enhances their cognitive skills. Experiences from these countries show that multimedia tools change students' approach to learning history, encouraging them not only to assimilate information but also to analyze it more deeply. Students study historical events with the help of virtual tours, interactive maps, and 3D models, which expand and enrich their historical thinking. Furthermore, this experience can serve as a valuable model for developing countries like Uzbekistan. By effectively integrating

multimedia tools into the education system, there are opportunities to strengthen students' thinking abilities, develop their historical thinking, and make the learning process more interactive. In this way, students will be prepared not only to memorize their history but also to study it more deeply and apply it in practice. The analysis above demonstrated the cognitive impact of multimedia tools on students' historical thinking. The expansion of these tools in the education system helps significantly improve students' thinking and learning outcomes. The use of multimedia tools in developing students' historical thinking creates new opportunities for making the pedagogical process more effective.

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