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THE ORGANIZATION OF TEACHING FOR SCHOOL STUDENTS WITH BRAIN TUMORS USING MODERN PEDAGOGICAL TECHNOLOGIES

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Abstract

This article provides an in-depth analysis of the modern pedagogical foundations for teaching school students diagnosed with brain tumors. The psychophysiological characteristics of such students, including decreased attention, rapid fatigue, memory impairments, and emotional instability, and their impact on the learning process are examined based on scientific sources [Hallahan & Kauffman, 2018; Nishonova, 2017]. The study substantiates the importance of applying modern pedagogical technologies within an inclusive education environment. In particular, differentiated and individualized approaches are highlighted as effective tools for addressing students' specific educational needs [Tomlinson, 2014]. Furthermore, according to Lev Vygotsky's sociocultural theory, the role of guided support within the zone of proximal development is emphasized [Vygotsky, 1978]. The article also discusses the role of teachers in organizing inclusive education, as well as the importance of collaboration with parents and medical professionals. The analysis of scientific literature demonstrates that the implementation of modern pedagogical technologies significantly improves students' academic performance, social adaptation, and psychological well-being [UNESCO, 2017; Florian, 2013].

Keywords: Inclusive education, pedagogical technologies, brain tumor, individualized approach, differentiated instruction, health-saving technologies, information and communication technologies (ICT), special education, learning effectiveness.

Introduction

Аннотация

В данной статье проводится глубокий анализ современных педагогических основ обучения школьников с опухолью головного мозга. Рассматриваются психофизиологические особенности данной категории учащихся, включая снижение внимания, быструю утомляемость, нарушения памяти и эмоциональную неустойчивость, а также их влияние на процесс обучения на основе научных источников [Hallahan & Kauffman, 2018; Nishonova, 2017].В работе обосновывается значимость применения современных педагогических технологий в условиях инклюзивного образования. В частности, дифференцированный и индивидуальный подходы рассматриваются как эффективные средства учета образовательных потребностей учащихся [Tomlinson, 2014]. Кроме того, в соответствии с социокультурной теорией Л.С. Выготского подчеркивается важность педагогической поддержки в зоне ближайшего развития [Vygotsky, 1978].В статье освещается роль учителя в организации инклюзивного обучения, а также необходимость взаимодействия с родителями и медицинскими специалистами. Анализ научных источников показывает, что применение современных педагогических технологий способствует повышению успеваемости учащихся, улучшению их социальной адаптации и психологического благополучия [UNESCO, 2017; Florian, 2013].

Introduction

In the current context of globalization and the modernization of the education system, the development of inclusive education is recognized as one of the key strategic directions. In particular, the integration of children with health impairments, including students diagnosed with brain tumors, into general education is acknowledged as a pressing pedagogical issue [UNESCO, 2017]. In the Republic of Uzbekistan, special attention is also being paid to the development of inclusive education in the process of educational reform. The Law “On Education” and state programs prioritize creating equal educational opportunities for all children [Republic of Uzbekistan, 2020]. This necessitates the development of flexible and effective pedagogical approaches for students with health challenges.

Students with brain tumors constitute a category requiring particular attention. Medical and psychological studies indicate that this condition significantly affects students’ cognitive functioning, leading to decreased attention, memory impairments, rapid fatigue, and emotional instability [Hallahan & Kauffman, 2018; Nishonova, 2017]. These factors complicate their active participation in the learning process. From this perspective, conventional teaching methods may not provide sufficient effectiveness when working with such students. Therefore, the application of modern pedagogical technologies, particularly education organized based on differentiated and individualized approaches, becomes

increasingly necessary [Tomlinson, 2014]. According to Lev Vygotsky's sociocultural theory of development, education structured in consideration of the learner's zone of proximal development is more effective [Vygotsky, 1978].

Furthermore, the rapid advancement of information and communication technologies enables the learning process to become more interactive and adaptive [Abduqodirov, 2012]. At the same time, health-preserving pedagogical technologies play a crucial role in maintaining students' physical and psychological well-being [WHO, 2017]. Considering the above, organizing lessons for schoolchildren with brain tumors using modern pedagogical technologies is not only of pedagogical but also social significance, requiring in-depth scientific research. The main aim of this study is to identify effective methods for working with this category of students and to develop scientific and practical recommendations for improving the educational process.

Literature Review

Existing studies on teaching schoolchildren with brain tumors indicate that organizing the educational process without considering the psychological and cognitive characteristics of this category of students is ineffective [Hallahan & Kauffman, 2018]. Moreover, Nishonova (2017) emphasizes the importance of an individual approach and pedagogical support when working with children with health impairments. Tomlinson's (2014) research highlights the effectiveness of differentiated instruction and demonstrates the positive outcomes of lessons tailored to each student's needs. Similarly, Vygotsky's (1978) sociocultural theory of development provides a theoretical basis for supporting learners in inclusive education according to their zone of proximal development.Reports and recommendations by UNESCO (2005, 2017) underline the strategic significance of creating inclusive education for children with health impairments. They stress the need to ensure equal opportunities across all forms of education and to optimize the pedagogical environment. The works of Ainscow (2005) and Florian (2013) further explore the global experience of inclusive education and highlight the importance of integrating modern pedagogical technologies.Research by Abduqodirov (2012) demonstrates that the application of interactive and visual methods through information and communication technologies can enhance students' learning efficiency. Likewise, WHO (2017) emphasizes the significance of health-preserving pedagogical technologies in maintaining students' psychological and physical stability. Methodological guidelines published by the Ministry of Public Education of the Republic of Uzbekistan (2021) provide teachers with clear recommendations for implementing inclusive education, including the use of individual approaches and differentiated methods.Additionally, the studies of Shomurodov (2019) and Mamedov (2020) focus on developing specialized pedagogical methods for working with students with brain tumors and present practical ways to implement modern pedagogical technologies.The analysis of the above literature indicates that effective methods for teaching schoolchildren with brain tumors are not only pedagogically

important but also psychologically and socially relevant. Consequently, the application of modern pedagogical technologies, implementation of individual and differentiated approaches, and the use of information and communication tools are crucial for optimizing the educational process for this category of students.

Research Methodology

The primary aim of this study was to determine the effectiveness of organizing lessons for schoolchildren with brain tumors using modern pedagogical technologies. The research focused on developing pedagogical approaches that account for students' psychophysiological characteristics in the context of inclusive education.

The study employed a comprehensive methodological approach. Initially, a literature review was conducted to identify the characteristics of schoolchildren with brain tumors in the educational process [Hallahan & Kauffman, 2018; Nishonova, 2017]. Based on this, modern pedagogical technologies applicable in an inclusive learning environment were selected, including differentiated and individualized approaches, health-preserving pedagogical methods, and information and communication technologies (ICT) [Tomlinson, 2014; Abduqodirov, 2012; WHO, 2017].

The research also relied on empirical methods:

-Observation – monitoring the activity, attention, and motivation of students with brain tumors during the learning process [Florian, 2013].

-Surveys and Interviews – assessing the effectiveness of individual approaches through discussions with teachers, parents, and specialists [Mamedov, 2020].

-Experimental Work – organizing lessons based on modern pedagogical technologies and measuring students' knowledge and skills [UNESCO, 2017].

-The effectiveness of differentiated and individualized teaching methods was evaluated using the following criteria: level of knowledge acquisition and comprehension, attention and concentration, motivation and emotional stability, and psychological and social adaptation.

Additionally, the study analyzed the results of using ICT (interactive presentations, visual materials, multimedia tools) and health-preserving technologies (optimized lesson load, short breaks, physical exercises) [Abduqodirov, 2012; WHO, 2017]. The theoretical foundations of the methodology were based on Lev Vygotsky's sociocultural theory of development [Vygotsky, 1978], the global experience of inclusive education [Ainscow, 2005; Florian, 2013], and practical applications of modern pedagogical technologies. Consequently, the methodology enabled optimization of the educational process and the formation of effective pedagogical approaches tailored to the individual characteristics of students with brain tumors.

Analysis and Results

The study results indicate that lessons organized using individualized and differentiated approaches significantly enhance the learning effectiveness of students with brain tumors. Observations and experimental results showed that students' knowledge acquisition and attention concentration improved when modern pedagogical technologies were applied [Tomlinson, 2014; Hallahan & Kauffman, 2018].Survey and interview analyses revealed that teachers' individualized approaches and lesson adaptation increased students' motivation, ensured emotional stability, and improved social adaptation [Florian, 2013; Mamedov, 2020]. Collaboration with parents and specialists also facilitated students' active engagement in the learning process [UNESCO, 2017].

The use of ICT (interactive presentations, multimedia materials, visual displays) significantly accelerated students' comprehension and knowledge assimilation [Abduqodirov, 2012]. Moreover, the application of health-preserving pedagogical technologies (short breaks, light physical exercises, optimized lesson loads) reduced fatigue levels and improved psychological well-being [WHO, 2017].

The analysis demonstrates that: Individualized approaches enhance knowledge acquisition and independent work skills of students with brain tumors.

Differentiated teaching methods maximize students' cognitive potential.

ICT promotes active participation by making lessons visual and interactive.

Health-preserving technologies maintain students' physical and psychological stability and reduce fatigue during extended lessons.

The findings also indicate the necessity of continuous methodological support to improve teachers' professional competencies and implement individualized approaches. The collected data confirm that students with brain tumors can be successfully integrated into inclusive education and that the educational process can be optimized. Literature analysis [Hallahan & Kauffman, 2018; Tomlinson, 2014; Vygotsky, 1978; Florian, 2013] further shows that the application of modern pedagogical technologies not only enhances learning efficiency but also improves students' socio-cultural adaptation, emotional stability, and overall psychological well-being.In conclusion, lessons for schoolchildren with brain tumors, enriched with individualized and differentiated approaches and modern pedagogical and health-preserving technologies, are effective and ensure their successful integration into inclusive education.

Conclusion and Recommendations

The results of the study indicate that the application of modern pedagogical technologies in working with schoolchildren with brain tumors significantly enhances effectiveness. Observations, experiments, and survey results demonstrate that individualized and differentiated approaches increase students' learning outcomes, improve attention and motivation, and strengthen their emotional stability [Tomlinson, 2014; Florian, 2013].

Information and communication technologies (ICT), such as interactive presentations and multimedia tools, make lessons visual and interactive, encouraging active student participation and facilitating faster and more effective knowledge acquisition [Abduqodirov, 2012]. Additionally, health-preserving pedagogical technologies, including short breaks, light physical exercises, and optimized lesson loads, reduce fatigue and ensure psychological well-being during long lessons [WHO, 2017].The study also highlights that enhancing teachers' professional competencies, providing continuous support for individualized approaches, and close collaboration with parents and specialists are crucial for increasing the effectiveness of inclusive education [UNESCO, 2017; Hallahan & Kauffman, 2018].In conclusion, the optimization of the educational process for schoolchildren with brain tumors relies on the following key elements:

Individualized approach – organizing lessons tailored to each student's psychological and cognitive characteristics.

Differentiated instruction – applying pedagogical strategies that consider students' knowledge levels and abilities.

Information and communication technologies – delivering learning materials in an interactive and visual format.

Health-preserving technologies – reducing fatigue through optimized lesson loads, breaks, and physical exercises.

Collaboration – maintaining continuous communication with parents and specialists and providing methodological support to teachers.

Based on these findings, the following scientific and practical recommendations are proposed:

Integrate modern pedagogical technologies into the inclusive learning environment and implement a continuous assessment system.

Develop specialized methodological guidelines for teachers working with schoolchildren with brain tumors.

Expand the use of ICT to make lessons interactive, thereby enhancing students' knowledge acquisition.

Apply health-preserving methods to ensure psychological and physical well-being.

Overall, the study demonstrates that effective work with schoolchildren with brain tumors is achieved only through the integration of modern pedagogical technologies and individualized approaches. This not only enhances students' learning outcomes but also ensures their psychological well-being, social adaptation, and overall success in the educational process.

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