

Methods Of Using Digital Pedagogical Platforms To Ensure The Cognitive And Social Integration Of Students In Need Of Long-Term Treatment

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Abstract: This article is aimed at ensuring the continuity of education for students in need of long-term treatment. The main focus is on addressing the problems of cognitive impairment and social isolation caused by illness and treatment. The article analyzes three main strategies for using digital pedagogical platforms: 1) Cognitive integration (adapting the lesson load to individual pace through adaptive learning and micro-education); 2) Social integration ("Virtual existence" and restoration of communication with the class collective through gamification); 3) Methodological integration (digitalization of information exchange between doctors, teachers, and parents). The study's conclusion emphasizes that when these strategies are applied comprehensively, they are crucial for ensuring inclusivity in education and supporting the psychological state of sick children.

Keywords: Hospital education, digital pedagogical support, adaptive education, micro-education, cognitive integration, social integration, gamification, inclusive education, long-term treatment.

Introduction: Students who are detached from the traditional educational environment due to long-term illnesses (for example, oncological, hematological, and chronic diseases) are at risk of being separated not only from the educational process, but also from the social environment. Ensuring cognitive continuity and social integration in the context of hospital and home education is one of the main tasks of modern pedagogy. The purpose of this article is to analyze strategies for effectively ensuring these two main types of integration using digital pedagogical platforms.

Cognitive integration means the continuity of education, that is, the ability to effectively maintain the speed and content of assimilation of basic knowledge and skills of the student, regardless of their physical condition (illness or place of treatment). This process, simple for healthy students, becomes a complex and delicate task for children in need of long-term treatment.

Long-term illnesses, especially severe treatment protocols (chemotherapy, radiation) in areas such as oncology or hematology, cause chronic fatigue in children. This fatigue is not only physical, but also cognitive. As a result, the student cannot perform high-

level cognitive tasks such as information processing, concentration, and long-term memory retention. Even short-term interest in the lesson quickly disappears due to energy deficiency.

Certain medications or treatment methods can directly affect the central nervous system. This condition is known in medicine as "Chemotherapy-associated cognitive impairment." It manifests itself in the following:

- o Memory deterioration.
- o Difficulty in clearly expressing an idea.
- o Difficulty concentrating. These impacts drastically reduce the pace of curriculum acquisition and hinder continuous learning.

Diagnosis, pain, regular medical procedures, and separation from classmates cause high levels of stress, anxiety, and depression in children. An emotionally troubled brain uses cognitive resources focused on learning inefficiently.

Therefore, traditional approaches to ensuring cognitive integration are insufficient. Modules of adaptive learning and micro-education, provided through digital pedagogical platforms, allow adapting to the changing

physical and psychological state of the child, maximizing the use of their minimal cognitive resources. This is the key to ensuring that the student does not lag behind their peers in terms of the curriculum even during the treatment period.

For children undergoing long-term treatment, the most important strategy is to organize the learning process that can adapt to their individual needs and current energy levels. Digital platforms are the only way to ensure this flexibility. Fatigue and cognitive impairments caused by treatment directly affect the student's ability to concentrate and absorb information. If the workload is too high, it only increases stress and increases hatred for learning. Adaptive learning works within the limits of the child's current abilities.

Adaptive education systems, by adapting the educational material to the individual pace, significantly reduce the level of stress in children with long-term illnesses and increase their motivation for learning[4].

It is necessary to introduce a mechanism for continuous assessment of the cognitive state through learning management systems (LEMS) based on artificial intelligence. This mechanism should automatically analyze the following. If a student is performing tasks slower than usual, the system should automatically ease the next module, considering this a sign of fatigue. If a student's physical condition (based on information entered into the platform by the doctor) allows them to study only 30 minutes a day, the system should stop working after 30 minutes and send a report to the teacher. If a child learns well in the morning and starts making mistakes after lunch, analyze this data and automatically reduce the class load or postpone the next learning block. This strategy does not waste the student's cognitive resources and fully adapts learning to their treatment schedule and physiological rhythm.

Children who are undergoing long-term treatment cannot concentrate on long lessons, they need to learn at any time, at short intervals. Therefore, it is strategically necessary to divide educational materials into short, fast, and easily digestible modules. Studies show that the most effective time interval for receiving new information is short, intensive blocks. For sick children, this rule is doubly important, since their ability to concentrate is reduced. Micro-education squeezes all the basic information into short videos, infographics, or interactive quizzes.

Micro-learning formats allow students to effectively use their limited cognitive resources, optimizing the assimilation of information, especially when their fatigue is high[2].

For each concept or rule, special short content should be created and posted on the platform. This can be in the following formats. The main idea of each lesson should be conveyed through 5-minute animation or a short video with comments. Short tests, consisting of 3-4 questions, allow the child to immediately reinforce learning. When an incorrect answer is given, the system automatically redirects to the concept video. This strategy allows the student to reinforce knowledge at 5-10 minute intervals several times a day at their discretion, without stopping learning even during the most severe periods of the illness, which is important for maintaining cognitive continuity.

Social integration is the preservation of a student's connection with peers, the classroom community, and teachers even during the period of treatment, as a result of which social isolation caused by the disease is prevented. Digital tools serve as the main "bridge" in overcoming this gap, reducing the child's feeling of loneliness in the hospital or at home. Ensuring a child's ability to participate in the classroom in real time is the most effective way to maintain social connections. This ensures that the child feels that they are part of a constant social environment, even if not physically, during the lesson.

Studies show that among children undergoing long-term treatment, the fear of being unlike their peers, being forgotten, or separation (feeling of loneliness) is very high. Through video communication, they not only listen to lessons, but also see the facial expressions of their classmates, listen to jokes, and, most importantly, consider themselves part of the team.

Children who are disconnected from education due to illness experience a high level of social isolation and feelings of loneliness. Maintaining regular contact with the class through online video connections is crucial for their socio-emotional health.[3]

Schools must equip classrooms with high-quality audio and video equipment. The platform used (e.g., Zoom, Google Meet) must strictly adhere to privacy standards (e.g., medical data protection) and strictly prohibit third-party access. In addition to providing the child with the opportunity to talk with classmates, participate in group work through voice or chat, organize short extracurricular video meetings (for example, a 15-minute "Library Break").

Some advanced hospital education programs use small robots or telepresentation systems that allow the patient's avatar to be moved in the classroom. This helps the child feel their place in the classroom more realistically. The introduction of game elements into education (Gamification) and the organization of virtual team projects are a motivational method for

strengthening social relations. This helps to return the treated child to the classroom process, where he is an active participant.

Gamification makes the learning process emotionally attractive. Stress is reduced by scoring points, raising levels, or turning a "dead" task into a "game." Virtual partnership projects, on the other hand, develop a positive connection between peers based on mutual assistance. Digital game elements (awards, points, degrees) increase motivation by making the learning process interesting for students, and virtual team projects develop peer collaboration skills[1].

It is advisable to work on general reports or research through specially created documents (for example, Google Docs/Sheets, Miro's board) that the teacher solves together with classmates. Through this, the student receiving treatment can have specific roles, such as analyzing information, and his classmates - collecting material. In educational games on the platform (e.g., Quizizz, Kahoot), allow the sick child to participate at the same level as their classmates. This ensures competition, positive emotions, and shared experience. The creation of closed and moderated (safe) chat channels (for example, a Telegram group) where students exchange ideas outside of class will give a positive result.

The success of digital pedagogical strategies depends not only on technology, but also on effective systematic coordination between the education and healthcare systems. These strategies are aimed at systematically supporting the above two types of integration. To ensure cognitive adaptation, information exchange must be fast, secure, and accurate. A closed digital system is needed for the rapid and secure exchange of information about the patient's condition and training load between all stakeholders. Through a closed, encrypted platform (compliant with confidentiality and personal data protection requirements), medical information (only what the teacher needs: energy level, allowable class time, fatigue forecast) is communicated to the teacher.

The teacher, based on the doctor's information (for example, "reduce the class load by 50% today"), promptly adapts the curriculum through the SSS, and this change is automatically communicated to the parents. Parents or the patient themselves can enter information about their physical condition and fatigue through the platform, which will help the adaptive system function. For the effective use of digital pedagogical support, hospital education teachers must know not only how to use the technology, but also how to adapt it to the special needs and psycho-emotional state of the sick child. It is necessary to introduce

special distance professional development courses for teachers working with sick children in a hospital setting. These training modules teach teachers not only how to teach, but also how to communicate correctly with children in difficult situations. Within the framework of the courses, teachers master the basics of medical psychology, learn to understand the mental state of a sick child and adapt to their capabilities through inclusive education. They will also acquire skills in using modern digital technologies (VR/AR), educational games, and interactive methods to make the learning process engaging. This helps children in the hospital not only to gain knowledge, but also to distract themselves from the illness and recover faster with the help of games and technologies. Creation of a centralized online library of methodology for working with digital tools, adapted to hospital conditions. Here, teachers can share best practices and ready-made Micro-education content.

CONCLUSION

In conclusion, the issue of cognitive and social integration of students in need of long-term treatment is one of the most important challenges of modern inclusive education. As analyzed in this article, traditional teaching methods cannot adapt to the changing physiological and psychological state of the child. Therefore, it has been proven that the strategic application of digital pedagogical platforms is crucial in overcoming this gap. The methods we propose - adapting lessons to the child's situation (Adaptive Education), providing information in small and easy segments (Micro-Education), and using game technologies (Gamification) - all serve one purpose. This approach not only ensures that the child does not miss classes, but also has a positive impact on their psyche. As a result, with the help of modern technologies, a child does not feel lonely, more easily overcomes the stress caused by illness, and their interest in learning increases. Most importantly, the digitalization strategy of the "Doctor - Teacher - Parent" triangle ensures the systematic and safe implementation of these processes. Only through continuous information exchange can the teacher adjust the learning load to the patient's current energy level. The introduction of digital strategies by our education systems is not just a technological innovation, but an important step towards ensuring an ethical and inclusive principle aimed at providing every member of our society, even the most vulnerable, with the opportunity to receive education and participate in social life. In the future, the full integration of digital pedagogy in hospital education will serve as the main guarantee of strengthening educational equality.

REFERENCES

1. Deterding, S., Dixon, D., Khaled, R., & Nacke, L. From Game Design Elements to Gamefulness: Defining "Gamification." *MindTrek*. (2011).
2. Hug, T. *Didactics of Microlearning: Concepts, Discourses and Examples*. Münster: Waxmann. (2005)
3. Kamenetz, A. *The Test: Why Our Schools Are Obsessed with Standardized Testing - But You Don't Have To Be*. PublicAffairs. (2014).
4. Shute, V. J., & Zapata-Rivera, D. Adaptive instructional systems. In R. A. Reiser & J. V. Dempsey (Eds.), *Trends and issues in instructional design and technology* (pp. 237-251). Pearson. (2012).