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INTEGRATING TECHNOLOGY INTO THE EDUCATIONAL PROCESS FOR CHILDREN WITH SPECIAL NEEDS: DRAWING ON EUROPEAN EXPERIENCE

Anastasiia ZUBRYTSKA
Yuriy Fedkovych Chernivtsi National University, Chernivtsi, Ukraine
zubrytska.anastasiia@chnu.edu.ua

Olha PALAHNYUK
Yuriy Fedkovych Chernivtsi National University, Chernivtsi, Ukraine
o.palahnyuk@chnu.edu.ua

Abstract

The article examines foreign experiences of integrating technology into preschool education with an inclusive approach. The author analyses the main initiatives that have emerged in the framework of international cooperation between European countries and presents practical experiences of using technology to support the education of children with special educational needs in several countries, including Sweden and Scotland.

Keywords: ***integration, technology, children with special educational needs, inclusive education, inclusive approach.***

1. Research context

Education is a fundamental right for every child, regardless of ability or disability. In recent years, there has been a significant increase in the integration of technology in education, and one area where it is having a profound impact is in the education of people with special needs. Educational technology is transforming the learning process for children with special needs, making education more accessible, engaging and inclusive.

According to the European Commission, around 10% of the population has some form of functional limitation. Of these, 84 million are teenagers and children, of whom 22%, or one in five, have developmental disabilities and need special support. This is a significant number of people who require an individualised approach to education, medical care and social support. These data also highlight the importance of adequate infrastructure and services to ensure that this group of children has access to education, health care and other areas of life (Vertuhina, 2017). Countries need to develop and improve their systems to ensure that children with different types of disabilities are fully supported and fully integrated into society.

2. Literature overview

The general problems of introducing technology into the educational process of children with special educational needs are reflected in the research of Ukrainian scientists: V. Vertuhina (2017), A. Kolupaieva (2020), L. Melnyk (2019), I. Sarancha (2019) and others. However, these researchers have not sufficiently reflected in their studies the analysis of European experience in the introduction of technologies in inclusive preschool education.

Various aspects of the introduction of technology in inclusive education are widely developed by foreign scientists and practitioners. English researchers from the University of Northampton, S. Sankardas (2017) and J. Rajanahally (2017), theoretically substantiated and experimentally confirmed the effectiveness of electronic media in the educational activities of children with autism spectrum disorder.

3. Purpose and aims of the study

The study aims at analysing the European experience of introducing technology into the educational process for children with special needs in order to identify best practices and strategies that can be adapted and implemented in the Ukrainian educational system. This will contribute to the integration of these children into society and improve the quality of their education.

4. The study

Unfortunately, students in special education programmes have traditionally faced difficulties. Educators and education systems have long struggled to access the knowledge

and resources necessary to meet the special needs of children. However, modern educational technologies can help to change this situation. Not only do educational technology tools provide teachers with access to learning resources that help them understand individual needs, but they also enable them to create personalised resources that are tailored to the needs of their students.

For instance, traditional learning materials, such as textbooks, are usually created without specific learning needs in mind, and cannot be easily modified for children with reading, visual or mobility difficulties. Instead, ordering alternative texts and materials in advance is necessary, although it can be time-consuming and may not always meet unpredictable and changing needs. Innovations in educational technology provide teachers with the tools to make a lasting difference in these children's learning experiences. Due to these evolving technologies, students enrolled in special education programmes can now anticipate each new school day with excitement, rather than dread (Melnyk, 2019).

The term 'special educational needs' encompasses a variety of learning difficulties, including specific impairments and learning and behavioural difficulties experienced by some pupils. In England and Wales, *the SEN Code of Practice* reflects the recognition that every child is unique. Local education authorities should acknowledge the existence of a broad spectrum of special educational needs, which are often interconnected, although there are also specific needs that are usually directly related to particular types of impairment.

In recent years, the concept of inclusion or inclusive education has emerged as a more equitable approach to meeting the needs of all children and has come to dominate special education practice worldwide. As a model for addressing special educational needs, it demands to remove barriers to accessing the education. There is considerable debate about the most effective means of achieving this. There is also a discussion regarding the responsibility of educators in providing support to pupils who face barriers to learning. Some argue that specialists should be brought in as needed, while others believe that children with difficulties should have direct access to specialists. Still, others argue that placing pupils with special educational needs in specialised institutions is the best way to include them in the educational process. To date, the debate on this issue remains unresolved. However, UK government policy generally supports inclusive education models that aim to promote inclusion and reduce the exclusion of vulnerable children from local educational settings' culture, curriculum, and communities (Deppeler, 2005).

The new standards for inclusive education require teachers to integrate technology into their teaching and it is crucial to prepare teachers at the pre-diploma practice to use technology in the classroom. The use of new technologies can improve the quality and accessibility of education, facilitate effective communication and collaboration, and create broad prospects for educating children with special needs.

Technology can level the playing field for students and increase their independence, freeing them from the constant need for direct teacher intervention. This increased sense of independence can reduce anxiety and increase confidence among children with special educational needs, as they are less likely to feel that they are disrupting the learning process of their peers. In addition, technology can be used by special education teachers to improve communication, reduce the need for teacher assistance, and give children more control over their education (Podulka, 2010).

The efforts of Certec, a Swedish university, to enhance learning and communication for children with special needs through the SID project, *'Sensitivity, Interaction and Participation'*, are highly valuable. Launched in 2010, the SID project aims to provide new opportunities for children with special needs by utilizing interactive technologies. The project's environments are designed to eliminate barriers for children with special needs. These interactive environments respond to children's actions. It is expected that they will provide new opportunities for perception, interaction, and participation through alternating sensory stimulation and relaxation, as well as interaction with people and objects.

Scotland has introduced the *Curriculum for Excellence* programme, which aims to support inclusive learning for children and teenagers from birth to 18 years of age. This programme offers flexible curricula for various age groups, including 0-5 years, 3-5 years, 5-14 years, and others. It is based on fundamental didactic principles, such as active, problem-based learning, support for the all-round development of the individual, sequencing of learning, and the use of play as a teaching method.

The experience of foreign countries demonstrates the use of technology in education at all levels, including inclusive preschool education. Approaches to teaching children with special educational needs may differ from country to country, but they all recognise the integration of technology into the learning process as a key tool for implementing inclusive education strategies (Loreman, 2005).

Modern technology plays an important role in the learning process. In this case, the teacher is required to be able to work with technology to be able to carry out the learning process successfully. The use of technology in inclusive settings is a challenge for teachers, requiring them to use more teaching strategies and methods to make them comprehensible to all children. It is a matter of great importance to be able Understand the needs and learning barriers of each child through a process called assessment. In the context of educating children with special needs, assessment becomes a core competency for teachers, especially for those who organise inclusive education. A full and thorough understanding of this process will only occur if it begins with an understanding of the nature of the individual education programme (Meijer, 2003).

These are some of the main ways technology is used in special education:

Accessibility and assistive technology are applied to help children with sensory, physical or cognitive disabilities to access learning materials and participate fully in the learning process. Examples of such technology include screen readers, text-to-speech software, alternative keyboards, and augmentative and alternative communication devices.

Personalised learning is also a key aspect of special education technology. Educational software, apps, and online platforms offer customised learning experiences, adaptive assessments, and content tailored to children's unique learning styles and abilities.

Communication apps, video conferencing tools, and social media platforms aid children with speech, autism, or social anxiety in expressing themselves, interacting with peers, and developing their social skills.

The text also mentions learning and skill development. Educational games, multimedia presentations, virtual reality (VR), and simulations can enhance comprehension, develop problem-solving skills, and make learning more engaging and accessible for a wide range of students.

Collecting data and tracking progress can help identify opportunities for improvement, track individual goals, and make informed decisions about teaching strategies and interventions for children with special educational needs.

Collaboration and professional development are also important aspects to consider. Online platforms, discussion forums, and video conferencing tools facilitate the exchange of best practices, resources, and knowledge. Furthermore, online courses and webinars provide

teachers with opportunities for professional development and improved skills to support children with disabilities.

The section on transition and life skills could be expanded to provide more detail. Digital organisers, task management apps, and vocational training software are useful tools for children with executive dysfunction or intellectual disabilities to develop time management, organizational, and work skills.

Interactive whiteboards

Smart boards are large interactive whiteboards that use touch technology to detect user input instead of mice and keyboards connected to personal computers. The computer's video output is projected onto the board, which serves as a large touchscreen. Instead of markers on the whiteboard, digital writing tools on a smart board use digital ink to control the input for handwriting and drawing. Interactive whiteboards can support inclusive classrooms by providing students with various ways to access information, express ideas, and demonstrate understanding.

They also enable teachers to work with different learning styles, including visual, auditory, and kinesthetic, to engage all students and facilitate differentiated learning. For instance, interactive whiteboards can assist children with autism in enhancing their communication skills through group collaboration. An interactive whiteboard allows teachers to present material visually and modify tasks to monitor learning easily. The touch-sensitive surface of a smart board can provide an opportunity for students with physical disabilities to participate in learning. It allows all children, including those who cannot hold a pen, to write and interact with content using the 'finger touch' function.

Inclusive educators appreciate the flexibility of smart boards, which allow them to quickly adapt activities to meet the needs of children. Teachers can create and modify activities during lessons.

Google, Microsoft and Canva

These online platforms allow teachers to differentiate learning and adapt resources to the individual needs of their students. These are powerful interactive tools that promote inclusive education by allowing teachers to create lessons, assessment methods, resources, grades, and feedback for everyone with minimal additional effort.

Audiobooks

Audiobooks can be beneficial for children, and their use does not hinder the development of reading skills. In fact, some experts argue that audiobooks can help children improve their reading abilities by expanding their vocabulary and boosting their confidence and independence. However, it is important to note that technology alone cannot improve reading skills. Therefore, it is recommended that audiobooks be complemented by structured reading interventions to further develop reading and comprehension skills outside of the classroom. Audiobooks that combine recorded stories with synchronised electronic text highlighting, i.e. a multisensory approach, can promote better comprehension and retention. Children with reading difficulties benefit from a multisensory approach as it provides deeper and longer-lasting learning and auditory reinforcement of written text.

Pen Readers

Pen readers are portable, handheld devices that scan and read text aloud in a digital voice. They often include a built-in dictionary that displays and reads the definition of scanned words. It is recommended that children use headphones when using reading pens indoors to avoid distractions. Pen readers can promote inclusivity, independence, and access to learning, making them a good option for supporting children with reading difficulties. They can improve the learning experience for many students who struggle to get the most out of their education by allowing them to read independently. Additionally, pen readers can facilitate access to written material during exams, thereby improving comprehension. The use of pen readers can reduce exam anxiety and increase a child's confidence. Students may require some time to adjust to using a pen reader, but they learn quickly and soon enjoy the benefits of reading independently.

Colour keyboard

A colour keyboard is a standard QWERTY keyboard that uses a special coloured key layout to aid individuals with cognitive, physical, visual, or motor impairments in learning to type by touch with correct finger positioning. The colour-coded keys enable children to identify different groups of keys on the keyboard, facilitating their typing learning and progression. Free online touch typing lessons are available through the Google platform to help students develop their touch typing skills (Bratitsis, 2012).

4. Summary and conclusion

In conclusion, technology will play an increasingly important role in inclusive education. The field of educational technology has grown exponentially in recent years, and integrating technology into the learning process of children with special educational needs is a key step in creating accessible and inclusive education for all. Thanks to modern technologies, such as interactive whiteboards, audio books, pen readers and others, students with diverse educational needs have access to a wide range of learning resources, enabling them to discover their potential, acquire knowledge, develop skills, and uncover their talents. These technologies create the conditions for success in education and future lives. Expanding the use of technology in educational institutions can improve education for children with special educational needs, leading to better academic success and overall development. Integrating technology into classroom practice creates new learning opportunities and provides an equal learning environment for all students, regardless of their characteristics and needs.

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