INCLUSIVE EDUCATION IN DIGITAL ERA: OPPORTUNITIES AND CHALLENGES FOR VIET NAM

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Implementing the inclusive education program for children with disabilities is one of the crucial tasks of the education sector, ensuring equality in education and creating learning opportunities for all. Similar to general education, in the current era of rapid scientific and technological advancement, applying advancements in science and technology to inclusive education programs for children with disabilities is essential to enhance educational effectiveness. In this article, through a comprehensive review of recent literature, the author introduces the concept of inclusive education and focuses on analyzing the opportunities and challenges in applying scientific and technological achievements into the inclusive education program in Vietnam. Based on this analysis, the author proposes suitable approaches for implementing inclusive education in Vietnam.

Keywords: inclusive education, children with disabilities, science and technology, opportunities, challenges

Received: 09/9/2025; Revised: 13/9/2025; Accepted: 25/11/2025

1. INTRODUCTION

In society, alongside children who develop normally in terms of physical and mental growth, there are also many less fortunate children who suffer from physical disabilities, intellectual developmental disorders, or neurological disorders. These children still have the need to study in order to seek opportunities for community integration and independence in life. Therefore, creating conditions and opportunities for children with disabilities to learn is one of the important responsibilities of relevant authorities, as well as of society, contributing to ensuring social justice and equality in education.

In the *Universal Declaration of Human Rights*, Article 26 clearly states: “Everyone has the right to education. Education shall be free, at least in the elementary and fundamental stages. Elementary education shall be compulsory. Technical and professional education shall be made generally available and higher education shall be equally accessible to all on the basis of merit” (United Nations, 1948). To create learning opportunities for children with disabilities, both globally and Vietnam, the inclusive education program has been implemented. This is an educational approach that ensures fairness and equality for children with disabilities, particularly by enhancing their capacity for community integration.

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In Vietnam's *Law on Persons with Disabilities*, Article 28 stipulates: "Inclusive education is the primary mode of education for persons with disabilities. Semi-inclusive education and special education are carried out in cases where conditions are not yet sufficient for persons with disabilities to study through inclusive education" (National Assembly, 2010: 13). Inclusive education is considered one of the foremost pillars of social policy, ensuring social justice and non-discrimination.

The *Law on Education* of Vietnam also affirms: "Inclusive education is an educational approach aimed at meeting the diverse needs and capacities of learners; ensuring equal rights to education, quality education, in accordance with the needs, characteristics, and abilities of learners; respecting the diversity and differences of learners and ensuring non-discrimination" (National Assembly, 2019: 6).

Therefore, inclusive education does not simply mean placing children with disabilities into classrooms but rather requires schools to apply learner-centered approaches to adequately respond to their needs. In the process of inclusive education, schools must recognize the diverse needs of students and respond appropriately to both students with disabilities and normal students, ensuring quality education for all.

According to the *Survey on Persons with Disabilities in 2023*, about 6.11% of Vietnam's population aged two and above are persons with disabilities, of which children aged 2–17 make up 1.98%. Furthermore, the data shows that the proportion of children with disabilities attending school at the appropriate age is 68.1% at primary school level, 53.0% at secondary school level, and only 30.8% at high school level. Meanwhile, 79.0% of persons with disabilities aged 15 and above are literate (General Statistics Office, 2024). This indicates that many children with disabilities still enter school late, and some do not attend school at all, resulting in 21% of persons with disabilities aged 15 and above being illiterate.

The *Survey on Persons with Disabilities in 2023* also reveals that only 23.9% of persons with disabilities participate in the labor force, and only 33.6% have internet access. There is also a stark disparity in internet access between urban and rural persons with disabilities, at 40.1% and 31.0% respectively. Moreover, 53.7% of persons with disabilities own mobile phones (General Statistics Office, 2024). Yet, mobile phones and the internet are essential tools enabling persons with disabilities to access modern scientific and technological achievements and the vast treasury of human knowledge. The data suggests that many persons with disabilities in Vietnam still lack both.

Regarding the current state of inclusive education in Vietnam, according to Mr. Nguyen Bao Quoc, Deputy Director of Ho Chi Minh City Department of Education and Training, the majority of schools with students with disabilities in inclusive education in Ho Chi Minh City have not yet arranged rooms for providing individual support sessions for students, and do not have specialized teaching equipment to

support students with disabilities in inclusive education (Cited in Yen Khuong, 2024). Ho Chi Minh City is one of the most modern and developed cities in the country, yet its investment in inclusive education infrastructure remains limited; thus, other localities are likely to face even greater challenges.

In the current era, advances in science and technology have created many opportunities for education, including inclusive education. Therefore, organizations and individuals engaged in inclusive education must increasingly apply digital technologies in teaching to support students with disabilities, helping them learn more effectively.

To write this article, the author relied on secondary data collected from official sources related to inclusive education for children with disabilities, such as published scientific articles, materials from governmental and institutional websites, legal documents, and regulations issued by state management agencies. Based on the collected materials, the author analyzed the issue through two main thematic directions: first, the opportunities that digital technology brings to inclusive education in Vietnam; and second, the obstacles and challenges in the digital transformation process of inclusive education programs in Vietnam. Within each thematic direction, the author further divided the content into subthemes for more detailed analysis. From this analysis, the author proposes multidimensional solutions to optimize the advantages of the digital era, aiming toward an education system where no one is left behind.

2. OPPORTUNITIES FOR INCLUSIVE EDUCATION IN THE DIGITAL ERA

In recent decades, the rapid development of science, technology, and engineering has created profound breakthroughs in social life. The advent of computers, electronic devices, the Internet, followed by the growth of Big Data, artificial intelligence (AI), virtual reality (VR), augmented reality (AR), educational softwares, applications, and platforms has brought many major opportunities for teachers and learners in the implementation of inclusive education programs in Vietnam.

2.1. Expanding access to education for children with disabilities

The development of technological devices and the widespread availability of the Internet have created many opportunities for children with disabilities to access the education system and the vast treasury of human knowledge. Online education helps break down geographical barriers, allow students from remote areas and different parts of the world to access high-quality educational content that was previously out of reach (Cited in Muchith, 2023).

Through digital devices and Internet connections, students with disabilities, regardless of where they live - even in remote, border, or island areas - can participate in educational programs and online training courses organized by schools and educational institutions. With the support of modern technological equipment, children with disabilities also find it easier to participate in in-person classes, absorb knowledge from teachers, and engage in classroom learning activities and assigned tasks.

Currently, there are many digital tools and resources available to support inclusive education, assisting both teachers and learners. These include assistive technologies for people with disabilities, such as computers, smartphones, the Internet, applications, softwares, online learning platforms, open educational resources, online classes, robots, artificial intelligence, and more, especially Massive Online Open Courses (MOOCs), where learners can access higher-quality materials than those available to them locally. MOOCs provide students with a basic learning experience, typically consisting of videos and quizzes. The innovation around MOOCs is not in the learning experience - it is typically a simplified version of a large lecture class - but, rather, in making materials developed by faculty at world-famous universities, often on highly specialised topics, accessible to learners around the world (OECD, 2021: 45). These tools not only foster inclusion for children with disabilities but also support teacher professional development, making teaching and classroom management more effective.

2.2. Enhancing personalization in learning

The digital era has introduced outstanding possibilities for personalized and adaptive learning. With digital technologies, children with disabilities - regardless of their circumstances or special needs - have the opportunity to access knowledge in ways that best suit their abilities, opening new doors for them in acquiring knowledge, developing skills, and integrating into society.

The use of learning analytics, artificial intelligence, and adaptive learning technologies has enabled the creation of customized learning experiences tailored to individual students' needs, preferences, and learning styles. In addition, digital technology allows for the adjustment of materials and teaching methods according to the individual needs of students (including those with special needs). Because of this, it can facilitate an adaptive learning environment enables students to follow the material more easily according to their capacities. Based on their study, Sofia Annisa Rahma, Anindya Larasati Ramadhani, and Zahra (2025: 181) pointed out that the synergy between pedagogical adaptation, technological innovation, and institutional support is a fundamental pillar that underpins the success of learning personalization strategies in dealing with complexity and diversity in the classroom environment.

Furthermore, with digital devices and tools, teachers can design flexible learning programs that are easily adjusted to the abilities and pace of each student. Learning support softwares can also provide personalized lessons in terms of content, level of difficulty, and mode of delivery (text, audio, images, video, etc.), tailored to the way each child processes information. For example, visually impaired students can study through audio materials, while hearing-impaired students can benefit from subtitles or integrated sign language.

In addition, assistive devices such as screen readers, text-to-speech softwares, specialized keyboards, or eye-tracking technology enable students with motor or

sensory disabilities to interact with learning content more easily. Thanks to these tools, barriers to accessing knowledge are removed, allowing students with disabilities to learn in their own way and maximize their individual potential.

2.3. Accessing diverse and appropriate learning resources

Students with disabilities often face difficulties when working with traditional learning materials. However, the advancement of digital technologies has opened up many opportunities for them to access information and resources more conveniently.

Today, there are many open educational resources on the Internet, which are freely available materials such as textbooks, lecture notes, and videos, with only an Internet connection and a digital device, children with disabilities can access educational resources from all over the world, unrestricted by geographical distance or mobility limitations (Hegarty, 2019). Those open educational resources provide millions of valuable materials in various forms, enabling learners to search for and study according to their personal needs. Moreover, through online platforms, learners can take courses from top universities and institutions, offering them an opportunity to receive a worldclass education without the need to relocate or incur high costs (Cited in Muchith, 2023).

In addition, with modern digital tools, the same content can now be presented in multiple formats - text, audio, images, video, and even virtual reality (VR) or augmented reality (AR). This diversity allows children who are blind, deaf, or have reading comprehension difficulties to access information in the way most suitable for them, thereby improving the effectiveness of their learning.

2.4. Increasing interaction and support in learning

For many people with disabilities, social communication is challenging due to limitations in mobility, vision, hearing, or speech. This often reduces their opportunities for interaction and personal development. However, with today's digital technology, powerful communication tools such as speech recognition softwares, text-to-speech converters, and digital sign language applications allow children with disabilities to more easily express their ideas, exchange information with teachers and peers, and engage more actively in the learning process. As a result, they gain greater confidence and initiative in communication and social interaction. Through these opportunities, children with disabilities can form or join learning communities, where they share experiences and support each other in both education and life.

Additionally, thanks to intelligent algorithms embedded in educational applications, analyzing learner data has become faster and easier. Teachers can closely monitor each student's progress and adjust teaching methods and content accordingly. Interactive technical educational tools and adaptive learning systems not only allow teachers to change and shape the content of the educational process and have an adaptive method of information interaction with students (Sh.A. Abduraxmanova,

2025), but also can also suggest suitable lessons, identify areas for improvement, and provide immediate feedback. These advantages ensure that children with disabilities receive timely support and are not left behind compared to their peers.

2.5. Expanding opportunities for connection and collaboration

In society, connection and collaboration are essential for personal development and social integration. For people with disabilities, physical and sensory impairments often create barriers to building such connections. However, currently the achievements of the Fourth Industrial Revolution and digital transformation have given people with disabilities more opportunities to connect and collaborate - not only within their own country but also with communities and individuals worldwide. Digital tools such as video conferencing, collaborative document editing, and online discussion forums were seen as effective means of promoting peer-to-peer learning and interaction, even in remote learning settings (Muchith, 2023: 16).

Through the Internet and social networking platforms, people with disabilities can participate in community groups, forums, and international projects. With online learning and conferencing tools, they can work in groups, join seminars, engage in professional discussions, or simply communicate, share, and learn from others. These connections and collaborations are not only valuable for learning but also have profound psychological benefits - helping people with disabilities gain confidence, feel valued, and overcome feelings of inferiority, isolation, or abandonment, while seeing life as more meaningful and worth living.

2.6. Promoting awareness and tolerance within the community

In current society, digital technology has transformed the way people communicate, study, and work, contributing significantly to the development of a more humane and inclusive society. According to Tara O'Connell, Chief of Education at UNICEF Viet Nam, when harnessed effectively, assistive technologies and digital tools become transformative forces, realizing the right to quality education for every child in Viet Nam (UNICEF, 2025). Thanks to the Internet and digital media, information, images, and stories about the lives of people with disabilities - their daily challenges, their willpower, and their perseverance - are shared widely and quickly with the community. The Internet and mass media are also powerful tools for spreading information about human rights, disability rights, and legal protections. Such information helps change public prejudices against people with disabilities and promotes greater respect for them.

Moreover, digital technology has provided many learning and working opportunities for people with disabilities. As a result, many have demonstrated their talents, achieved outstanding academic results, and gained remarkable accomplishments in work and production. Authentic stories and information about such individuals, when shared online and within communities, have played an important role in eliminating contempt and pity toward people with disabilities. Instead, these stories foster

appreciation, respect, and willingness within society to cooperate and stand alongside people with disabilities in education, work, and life.

3. CHALLENGES FOR INCLUSIVE EDUCATION IN THE DIGITAL ERA

Alongside the advantages and remarkable opportunities brought about by modern science and technology, the application of technological achievements to inclusive education programs in Vietnam currently faces numerous difficulties and challenges.

3.1. Disparities in access to digital technology

To fully leverage the strengths of digital technology, technological devices and digital infrastructure for Internet connectivity are required. At present, many schools in Vietnam - especially primary schools and those in remote, mountainous, and rural areas - still lack the basic conditions and facilities needed for teachers and students to use digital technology in teaching and learning. As a result, many students do not have opportunities to access information technology.

This reality is reflected clearly in UNICEF's *Summary report on education in Vietnam 2022*, which shows that only 39% of young people aged 15 to 24 possess information and communication technology (ICT) skills. There is a disparity in ICT skills across educational levels: 54% of students at the high school level and above have ICT skills, whereas only 5% of secondary school students do. Moreover, the proportion of young people in urban areas with ICT skills is double that of their rural counterparts (UNICEF, 2022: 15).

In addition, the percentage of the population aged 3-24 with access to both the Internet and a computer is 60% in urban areas and only 24% in rural areas; in education sector, this is 32% in primary schools, 35% in secondary schools, and 42% in high schools (UNICEF, 2022: 52). Therefore, there is a significant gap in digital access between students in general - and students with disabilities in particular - depending on whether they are in urban or rural areas, and between lower education levels (primary, secondary school) and higher ones (high school, university).

This makes it especially difficult for students with disabilities in remote and mountainous areas, particularly at the primary school level, to access the rich sources of digitized learning materials. They also lack modern technical means to support them in their learning process. Moreover, primary school is the first stage of the general education program; if children at this level do not have adequate conditions and supportive tools to participate, they effectively lose the opportunity to pursue further education, as they will not be able to continue to higher levels. The disparity in digital access between urban and rural students with disabilities has, in turn, exacerbated inequality in education.

3.2. Lack of suitable digital resources for students with disabilities

With the rapid development of digital technology in education, nowadays, in Vietnam there are many websites that share documents and numerous open libraries for

community use. However, the number of resources designed specifically for people with disabilities remains quite limited. For example, learning materials in Braille, audio materials, lessons presented in sign language, interactive content, or videos with captions or sign language interpretation are still scarce.

According to the World Blind Union, less than 10% of published books are available in formats such as Braille, audio, e-books, large print, or sign language to serve people with disabilities. In Vietnam, a study conducted by the Blind Association in cooperation with the United Nations Development Programme during 2022-2023 found that 62.1% of people with disabilities reported that natural science books and materials in accessible formats were very scarce or unavailable. Furthermore, 44.5% shared that textbooks and learning materials in accessible formats were also extremely limited or absent (Cited in Thu Ha, 2024).

This situation reduces the effectiveness of inclusive education in digital environments, making it difficult for children with disabilities to keep pace with the mainstream curriculum.

At the same time, budgets for producing digital learning resources for students with disabilities remain limited. In order to do this work effectively, not only financial resources but also specialized human resources are required, along with close collaboration between special education experts, technology technicians, and users themselves. This represents a significant challenge in developing digital learning resources to support students with disabilities.

Currently, in Vietnam, there are some projects dedicated to producing digital learning materials for people with disabilities. Firstly, it is the *Audio book project for the blind* led by Nguyen Huong Duong. On 19/5/1998, Miss Nguyen Huong Duong initiated the project of producing audio books for the blind. The main goal of this project is to provide audio books for blind people freely. At the beginning of the project, there were some people donating money for her to run the project. Miss Huong Duong was the main reader to read books from printed books into audio books. On the 15th anniversary of establishment the Audio Book project, 05/01/2014, the project has recorded 1,300 books and distributed more than 270,000 audio cassettes and compact dishes, and online version of the audio books for the blind in Vietnam. Unfortunately, Miss Huong Duong was passed away on 25/04/2018. At that time, the project produced more than 2,000 audio books with diverse types of topics. Until now, the project is still being run by other volunteers (Audio book library for the blind, 2025).

Besides, *Braille library for the blind in Vietnam* is another significant project providing Braille book for the blind. This project was funded by the Japan International Cooperation Agency in Vietnam (HNM, 2004). And *Tactile books, books for sharing* is also a meaningful project focusing on producing books for blind children, started in 2018 and running by Director Trinh Thu Thanh (To An, 2020). The projects on compiling materials for people with disabilities of Action to the

Community Development Center (ACDC) are also very valuable for people with disabilities in Vietnam. ACDC is a Vietnamese non-government organization, established in 2011, for and of persons with disabilities, to support the persons with disabilities and vulnerable groups in the society (ACDC, 2025). However, most of these projects are small in scale, spontaneous, and voluntary efforts initiated by individuals or organizations in society.

3.3. Incomplete regulations and policies

Although the government's policy to implement educational support programs for people with disabilities in Vietnam was clearly established in Article 58 of the *Law on Education*, promulgated in 1998 (National Assembly, 1998), and inclusive education for people with disabilities was specifically stipulated in Circular 39/2009 of the Ministry of Education and Training (2009), regulations on investment policies, equipment procurement, and budget allocations for building digital resources for inclusive education remain unclear.

On this matter, Article 10 of *Circular 03/2018* issued by the Ministry of Education and Training regulates: "1. Educational institutions shall ensure minimum conditions regarding facilities, means, equipment, teaching aids, and toys to meet the requirements of inclusive education for people with disabilities. 2. Educational institutions are encouraged to cooperate with organizations and individuals to design and produce equipment, means, teaching aids, and toys for people with disabilities". Meanwhile, Article 16 of the same Circular stipulates: "d. Ensure budget allocations and minimum conditions in terms of facilities, means, equipment, teaching aids, and toys to meet the requirements of care, early intervention, and inclusive education; train and foster teachers, lecturers, and staff to meet the quality requirements of inclusive education in localities; direct district and city-level People's Committees to ensure the minimum conditions required for inclusive education locally; đ. Mobilize resources from the community, organizations, and individuals at home and abroad to support the implementation of inclusive education at the local level" (Ministry of Education and Training, 2018).

Although these regulations mention the provision of equipment and teaching aids for inclusive education, they remain broad and lack specificity and detail, creating difficulties for school administrators in the process of purchasing equipment as well as digitizing learning materials for students with disabilities.

3.4. Stigma within the community

Although public awareness has improved and information and legal provisions regarding the rights of people with disabilities, human rights, social justice, equality, and equal access to education have been widely disseminated, many individuals still harbor prejudices against people with disabilities. Some continue to look down on and disparage them, and cases of bullying or mistreatment of people with disabilities still occur.

According to the Institute for Community Development Studies, in 2019, 14.3% of research participants believed that people with disabilities could not have a normal life like others in society. The proportion of people with disabilities facing obstacles to marriage in 2019 was 21.4%. Additionally, 41.1% of people with disabilities were unable to secure employment. Among those who did find work, 17.9% reported being denied promotion or subjected to labor exploitation (Institute for Community Development Studies, 2019).

Furthermore, data from the *Survey on persons with disabilities in 2023* revealed that, 31% of respondents believed children with disabilities should attend school with normal children; 16.3% thought children with disabilities should attend specialized schools/classes; and 48.8% said the decision should depend on the type and degree of disability. Among rural respondents, 32.9% agreed that children with disabilities should study with normal peers, compared to only 27.8% in urban areas (General Statistics Office, 2024). This indicates that stigma and discrimination against people with disabilities in education still persist.

Stigma and discrimination often result in many negative consequences for people with disabilities. Being discriminated against deprives them of opportunities to participate in cultural, political, economic, and social activities, as well as opportunities to integrate into the community. Furthermore, stigma, bullying, and harassment deprive many of the chance to study and reduce their access to employment, forcing them into economic dependence on others or into poverty. In addition, stigma and discrimination within the community deny many people with disabilities the chance to receive love, get married, and build a happy family life.

4. CONCLUSION AND RECOMMENDATIONS

In the digital era, the development of science and technology has opened up many major opportunities for inclusive education. The research findings presented above reveal that Digital technology increases access to education for people with disabilities, providing numerous tools that help personalize learning.

In addition, digital technology also facilitates access to diverse and suitable learning resources that match the individual characteristics of learners, while making it easier for people with disabilities to interact, connect, receive support, and collaborate in both learning and daily life. However, given Vietnam's current socio-economic conditions, the application of scientific and technological means and devices in the implementation of inclusive education still faces many difficulties and challenges, especially lacking of suitable digital resources for students with disabilities and the incomplete of regulations and policies.

Based on the analysis of opportunities and challenges in implementing inclusive education in the digital era, several recommendations are proposed to enhance its effectiveness in Vietnam.

First, schools should be equipped with essential digital devices to support inclusive education, with priority given to remote and disadvantaged areas. At a minimum, classrooms need to have computers, projectors, and stable Internet connections.

Second, the government and relevant authorities should issue official documents and detailed guidelines on equipping schools with technological means, software, applications, and digital resources. At the same time, they should strengthen communication campaigns to raise public awareness about the rights of people with disabilities, the importance of social equality, and the consequences of discrimination - making effective use of digital platforms to reach wider audiences.

Third, technology developers and service providers are encouraged to invest in creating and delivering specialized software and applications that support students with disabilities.

Finally, communities and social organizations should actively contribute their resources to initiatives that support people with disabilities, ensuring that technological devices are made available free of charge or at subsidized costs for the people with disabilities.

Although the article has provided a relatively detailed account of the opportunities for inclusive education in the digital era, as well as the obstacles and challenges in the digitalization of inclusive education in Vietnam, its reliance on secondary data, some of which were collected several years ago, reduces its level of currency. As a result, the analysis may not fully capture the current obstacles and challenges faced by inclusive education for children with disabilities in Vietnam today.

With the topic of inclusive education in the digital era in the Vietnamese context, future research could examine the current challenges encountered by localities in implementing digital transformation in inclusive education, as well as investigate the digital transformation processes and the achievements attained by institutions in carrying out inclusive education. ❑

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