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## CHAPTER 19

### ROLE OF TECHNOLOGY IN SPECIAL NEEDS EDUCATION: BREAKING BARRIERS AND HARNESSING OPPORTUNITIES FOR INCLUSIVE EDUCATION AND WORLD OF WORK

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#### **Introduction**

Special education is associated with the efforts to educate children and youth with special needs and those living with disabilities. It is considered a modified programme with its unique tools, techniques and efforts targeted at meeting the needs of exceptional children. As pointed out by Cook and Schirmer, (2003), the arrangement justifies the specialized nature of the discipline. Basically, the specialisation seeks to provide adequate training to people with special needs and or those with disabilities. Although, sometimes, questions are raised on special education deserving a special recognition on the notion that it systematically or automatically categorized some students as minority within the school system (Wang, 2009); it is mostly favoured to differentiate individuals with special needs and person with disabilities on the account of extra provisions to access and participate in education and to learn.

A child is considered to have special educational needs if they have a learning or disability that make learning difficult compared to children of their age (grade). Generally, they are students who have problems with schoolwork or communication and or behavior and therefore require specialists who can undertake the helping tasks to maximize their performance and educational progression. Children with special needs have always been given the right and responsibility to adapt to their surroundings, so it is natural that they want to be able to participate in their surroundings. Hence, they need specialized instruction or scaffolding support, visual aids, check-ins among others to put them on the track. Those who provide these essential tasks are referred to as special needs educators. Today, it is more appropriate to use the term special needs education as against special education, getting above the defined need for education of children with disabilities especially in special schools or institutions distinct, into educational intervention and support designed to address special educational needs (OECD, 2007; UNESCO 2020).

#### **Inclusive Education**

Inclusive education is a political will to ensure that people with special needs and those with disabilities have equal access to educational opportunity like other



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individuals. As pointed out by Slee (2018), it is both an educational goal and a methodology; a philosophy and a legislative framework, a right, a means by which all other rights are realized, and a moral obligation. All students in inclusive schools have the same rights and responsibilities and receive no special treatment (Andrean, Pradipta, & Purnamawati, 2021). The CRPD's General Comment no. 4 to Article 24 (GC4) put it as fundamental human right of all learners (UNCRPD, 2016). It is borne out of belief that education is a right of every individual and not the right of a parent or caregiver. Unfortunately, recent records have defined a wider gaps in education outcomes among students with and without disabilities. Individuals with special education and people with disabilities are still frequently segregated in multiple institutions of learning or in mainstream settings with insufficient support today (Hayes & Bulat, 2017). There is also evidence that many people with remedial education leave school with few or no qualifications, moving on to specialist post-school training that takes them further away from formal sectors (OECD 2012).

### **Technology**

An important competency tool for special education is technology. Technology learning plays a significant part in the process of teaching and learning and it may be a lesson in compensatory education that helps solve difficulties. It is therefore important that teachers or instructors in special education should be familiar with technologies that might assist students overcome their academic weaknesses, especially in middle and high schools (Mull & Sitlington, 2003). When these students leave high school or colleges, they will be able to live independently and behave accordingly especially on the accord of these assistive technologies. In this digital era, providing great education to students necessitates instructors being current on technology changes. Teachers or instructors must have the technical requisite skills to utilize the potential of computers and the technology associated with them for good teaching. Some assistive technologies allow students who have disabilities to use computers, while others provide previously unavailable educational opportunities (Andrean, Pradipta, & Purnamawati, 2021).

### **World of Work**

World of works explain various career-laden, a choice of professional destination to fulfill one's life goal and maximize happiness. An important aspect of world of work lies in its expansion; as some types of jobs are fast replacing others (World Bank, 2018). These changes are brought by improved knowledge and technological innovation. Importantly too, the world of work is not exclusive of ideological fronts as every government seeks development through strategies that cultivates innovativeness and productivity among its citizenry. Today, unemployment rate is high among youths in developing countries and governments have continued to encourage self-employment as both instrument for sustainability and massive firm growth.



Computers are an important part of today's classroom. Among the most significant implications are assistive technologies (assistive technologies), which help children with exceptional needs learn to complete school and daily life tasks. Some assistive technologies allow disabled students to use computers, while others provide previously unavailable educational opportunities. Among the most important assistive technologies are those that enable students with disabilities to use computers and other modern communication technologies.

### **Technology and Inclusive Education**

Inclusive schools are those that place all students in the same classroom, regardless of circumstances, physical, intellectual, social, mental, or emotional issues (UNESCO, 1994 not listed in references.). This includes children with impairments, those are too indolent to study, untalented, and children from poor socioeconomic backgrounds. Importantly, inclusive practice is a global agenda that is reflected in national education policies around the world (Dyson, 2004). For this feat, technology has always been on the card for achievement of this goal. Education technology integration creates a highly large, open, and welcoming learning environment. The inclusive education system stresses mutual respect for diversity at all times. As a result, the remedial education technology system works to remove barriers, address challenges, and assist in the implementation of inclusive education for children with special needs (Handicap International, 2022).

NVDA (Non-Visual Desktop Access), JAWS (Work Access by Speech), and I-Chat are three adaptive technologies that can be used to help special needs students cope in an inclusive classroom (I can hear and speak). This service strives to ensure that no child is discriminated against, regardless of origin, economic status, or culture, so that they can develop and learn in the same way as other children. Technology can help children with special needs in a variety of ways. Some illnesses, for example, prevent students from using handwritten text, which is an important component of "traditional" education. Using technology tools designed for human speech recognition and synthesis, you can eliminate the use of paper and ink during classes.

Such technology would also be beneficial for pupils who have problems that prevent them from properly processing visual information. Adaptive computing technology enables the use of digital equipment to avoid difficult activities. Visually impaired pupils can utilize the computer using screen reader apps such as JAWS and specially built Braille keyboards. Augmentative communication technologies assist kids with speech difficulties in breaking down communication barriers. For more effective communication, such systems include visual charts, books, and specialized computers with word-prediction functions. Students with impairments can benefit from special education software.

According to McCain (as cited in Ertmer, 2012), "the use of technology within the classroom does not represent the major issue confronting student with learning difficulties in the twenty-first century." Rather, the most important issue



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is to develop thinking skills in our students with disabilities so that they can use technology to resolve academic problems and accomplish productive work" (p. 424). Weber (2006), identified three key themes related to technology as barriers to inclusive education: (a) insufficient instruction, (b) insufficient computer systems, and (c) frustration. Weber cited a lack of administrative support, fiscal constraints, policy uncertainties, logistical constraints, competing purchasing decisions, support service deficiencies, and inexperienced staff as obstacles. He also identified classes of technical barriers discovered by other academics. These really are (a) anxiousness, (b) suspense, (c) thoughts of folly, dread of the unknown, and fear of dehumanizing consequences, (d) computer addiction (microcomputer mania), and (e) computer phobia (cyberphobia), which may include violent resistance and disturbance.

Beggs (2010), identified a critical technology, lack of (IT) information technology training and confidence, as a barrier to inclusive education. While there is evidence that technology has been used in classrooms in the past, not all special education teachers are prepared to use IT in scientific instruction. Some teachers, even those who are well-educated and extremely knowledgeable in their field of science, have been documented as being afraid of technology, most notably the fear of appearing ignorant in front of their students if they do not use IT. Fear of failure is a very real problem. Many teachers, according to Ertmer (2009), may ask themselves a difficult question: "What will I do if the technology fails and I am unable to complete the class as planned?" In fact, this tends to obstruct the use of technology in the classroom. This barrier is logically reduced to the extent that teacher training and technical assistance can address instructors' concerns about what happens when technology fails. According to Al-Mohaissin (2013), some technologies are a hindrance to inclusive education. He observed inconsistency and incompatibility in special education teacher training, available software, and technology.

Furthermore, software program for special needs children is rare and expensive, and what is available is outrageously costly. Al-Mohaissin (2009) sees a lack of sources of finance as a barrier, but he blames the performance and compatibility issues on a lack of IT professionalism at the purchase level. The term "availability and accessibility" refers to the technological infrastructure required to incorporate technology in the classroom, which should be easily accessible (Ensminger, 2008). This type of hurdle includes "restricted access to useful, relevant, and appropriate hardware and software, hardware or software availability to teachers, and the quality of the hardware and software" (Lowther, Inan, Strahl, & Ross, 2008; Rogers, 2000, p. 459). There should also be support personnel on-site to deal with any issues or concerns that may arise. According to Inan and Lowther (2009), the increasing availability of technology does not always improve the performance of students with disabilities in classroom teaching practices that incorporate technology.



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Teachers in special education often had significantly fewer instructions to use technology than teachers in more advantaged schools. The challenge for less affluent schools was getting prepared teachers in the classrooms to use technology while being both willing to incorporate "changing world of technology as they surfaced" (p. 27). Another issue that both educators and students with learning difficulties faced was the tenacity of unequal education. Inequity education means that students with learning difficulties and educators continue to be rejected access to cutting-edge facilities, financial resources, hardware and software. Inequitable education is also characterized by a lack of technology initiatives as a consequence of other critical matters such as overcrowded classes, teacher and administrator retention, high rates of dropouts, curriculum policy changes, and school safety (Kress, 2011).

### **Technology, Special Education and World of Work**

The world of work is fast expanding into ideological fronts, capitalizing on human capital of every State. As such, every individual has huge role to play for manpower, experience and skills. However, the ever-changing status quo as initiated by improved technology requires that everyone have to learn not only to adapt but also as fast as possible to record greater achievements. People with special needs are not exempted from this real-life experience too, they do not only have to work but with modern equipment and or technological facilities at their disposal to fit well into the society.

In today's computer systems represent the most efficient method for gathering data. Various types of assistive devices (AD) have been developed to allow individuals with various kinds of disabilities access to computers. Blind people could indeed scan electronic information utilizing braille keypads or touch devices. The latter requires the use of screen software, which can read out loud all of the data that appears on the screen. Physically disabled people unable to utilize mouse or keypad devices to operate computer systems could use wands and sticks to simulate keyboard features or trackballs to replicate mouse functionality. They can interact with computer networks using airflow on a straw, tube, or paintbrush with sip-and-puff systems (Microsoft Accessibility, 2013). The execution of computer actions and commands via speech or eye tracking is a promising technology, particularly for physically disabled people. This enables people with certain disabilities to scan and gather data in a more suitable and quick manner. These techniques are continuously of been improved in order to provide more precise solution to address users (Beelders & Bignaut, 2010).

Self-employment or entrepreneurial is a renowned profession these days. Regardless of the size of the company, the certain threshold of organization is essential (Singla, 2011). Corporate organization is composed of a technique, innovation to enact that approach, and an innovator or employers who work to achieve company goals (Medina, 2008). Entrepreneurs require data to formulate a corporate plan and make a digital decision. Most data is now available in digital



form. In the case of blind people, the information must be perceptible, such as information on a website. Data for physically disabled people should be integrated in an useable structure. The availability of the web's information can be guaranteed by using web accessibility standards such as WCAG 2.0. Furthermore, gathering corporate objectives necessitates ongoing tracking and planning. Accessible applications such as process management or systems for enterprise resource planning must be given or created to assist disabled entrepreneurs in these activities (Vaziri & De Oliveira 2014; Vaziri & De Oliveira 2012).

People with disabilities face a slew of challenges which limit or indeed inhibit them from establishing their own businesses. Important stumbling blocks for disabled people in crucial aspects of business that innovation can decrease or even nullify. Dialogue in the corporate world is divided into six distinct channels of communication. E-mail, phone calls or voice mail, face-to-face chats, faxes, and correspondence are the most widely used channels of communication (Guffey & Loewy, 2008). Depending on their disability, individuals will choose one channel over another.

A physically disabled entrepreneur in a wheelchair, for example, will prefer e-mail, phone calls, and letters to face-to-face conversations if the disabled entrepreneur must visit the business partner in an unknown and possibly inaccessible area or building. Communication channels such as paper-based fax or letters are totally unavailable to a certain groups of disabled people, such as blind people. These institutions encourage digital communication channels such as e-mail or phone calls. Although the majority of business-to-business interaction is now conducted via e-mails and phone calls, crucial facets such as the bargaining of contract terms or the summary of contracts still necessarily require paper-based interaction or face-to-face dialogue.

Aside from forms of communication, having access to data about corporate assets, such as bank situations, supplier propositions, or recruiting portals, is essential. This data may be most proficiently collected on the World Wide Internet to a certain extent. As previously stated, information found on the internet must be accessible to individuals with disabilities. As the web is currently unreachable, a blind entrepreneur or an entrepreneur who struggles to continue operating keyboard and mouse devices will face significant difficulties in identifying suitable proposals from vendors, necessary information about bank conditions, or suitable employees from recruiting platforms.

Software configuration applications are frequently used to apply effective accounting standards. These software products necessitate the use of keyboard and mouse devices by the user. If a physically disabled person struggles to operate these devices, he should consider hiring or assign someone to perform the job. Even though this would result in extra expenses and thus distinguish against a physically disabled entrepreneur who really is capable of handling financial reporting on their own, the physically disabled entrepreneur could at least supervise the financial reporting. In contrast to blind users, who are incapable of



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operate accounting system due to a lack of ease of access and must depend solely on someone recruited for the work.

Since the entrepreneur is subject to liability for accounting irregularities, the blind entrepreneur's incapability to monitor financial reporting can have legal repercussions. Technology is extremely crucial in fields such as workplace operations, business operations, business accounting, and business marketing (Langer, 2005). As a result, being unable to apply such technologies will indeed place the innovator at a serious disadvantage. Regarding individuals with disabilities, one should presume that some groups of disabled entrepreneurs will find it difficult to use these technologies to define institutional culture owing to technological barriers.

### **Potential Technologies for Learning**

With the advent of computers, education technology has changed significantly, and a variety of possibilities for assisting teaching and learning have emerged. The role of computers in assisting students and educators has evolved as their processing and data storage capacity has increased. The use of computers to provide educational materials with extra multimedia features such as visualizations, clips, graphics, simulation tools, and electronic games converted computer systems into hang aids for students and teachers (Rutten, van Joolingen, & van der Veen, 2012). The impact of ongoing developments in information and communication technologies (ICT) on instructional technology is significant. While most current research concentrates on educational design that can be utilized to boost knowledge acquisition and interrelations between educators and learners in traditional learning situations, teachers and students in remedial education have not garnered the same benefits. Assistive technologies were used to describe many of the technologies used in special education (Edyburn, 2013).

Current technology has tremendous opportunities for special education activities for learning and teaching. Alternative computer conversations, faster preparation, elevated animated visuals, and internet connectivity all contribute to better learning environments for students, teachers, and parents. Beyond the basic track pad interface, video games such as Nintendo's Wii and Microsoft's Xbox, in addition to tablet devices, provide a variety of ways to connect with computers. The provided many opportunities orders to computers via keyboard and mouse in the traditional paradigm; however, successfully using keyboard and mouse requires hand eye coordination, that not all special education kids might also have (Shimizu, Yoon, & McDonough, 2010).

Rather than employing a mouse and keyboard to communicate with computers, using hand movements or smart phones gives excellent interaction and experience design outcomes (Findlater, Froehlich, Fattal, Wobbrock & Dastyar, 2013). Educators with special learning needs or with neurodevelopmental disorders can be classified as students with low intellectual qualifications. Some overall students' perception include a shorter attention span, a low operating



memory potential, the need for continuous training and feedback, and difficulties connecting events and people in the same tale (Bender, 2008). For these students, pretty standard instruction is defined and designed, follows clear standards, evolves in gradual incremental, and keeps repeating procedures and suggestion boxes as many times as students require (Kirk, Gallagher, Coleman, & Anastasiow, 2011).

This sort of admonishment can be formed using academic technology tools like computer systems, ipads, and gaming systems. According to research, educational technology benefits special education students, particularly in concept teaching and practice-feedback type instructional activities (Carter & Center, 2005). In general, video-based or keypad interaction computer-based techniques have been employed in special education cases where student interaction and feedback potential is limited. However, technology advancements that allow students to communicate through alternative channels such as body gestures or touch screens have the potential to improve student learning outcomes (Hwang, Wu & Fan-Ray, 2013).

Although education technology produces positive educational outcomes, teachers play a critical role in enabling the dispersion and application of educational technology (Inan & Lowther, 2010). Teachers are the primary users of educational technology in schools. Members of an educational institution's teacher body are the primary users of technology in their classrooms, whether for presentation, record keeping, communication, or information search (Bingimlas, 2009). Certain factors influence educators' use of technology within the classroom. Bingimlas (1999), divided these factors into two categories: internal and external.

Teachers' attitudes, motivation, and competency that use technology within the classroom were identified as internal factors, while syllabus, technical resources, mentoring, and schooling system were identified as external factors. There are innumerable studies in the literature that investigate these factors in a variety of teaching subjects (Abbitt, 2011), but the majority of them have centered on mathematics, science, and elementary education. Special education and special education teachers have usually been ignored or studied seldomly in digital literacy studies (Smith & Okolo, 2010).

Many efforts have been made in the country in recent decades to replace preconceptions and traditional teaching strategies with new and innovative strategies based on the specific and cultural needs of the learners. These initiatives will encourage students with disabilities to be imaginative and expertise producers, as well as open up new possibilities in the field of technology. Changes have also been made to the schooling institutions and textbooks for students who are disabled. Despite all of the department of education's efforts and high costs, we continue to see traditional and teacher-centered approaches to science education.

The following factors can be considered as reasons for traditional teaching persistence methods (Ahadian, Mohammad Aghazadeh, & Muharram, 2000). The effect of the education based program and its shaping on the instruction: the



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structure of a current societal schooling institutions, which include views and beliefs, plans and regulatory requirements, may have an influence on the teacher's method of instruction. The educational system's interest or lack of attention to the necessities of students who are disabled and humanity, the instructional system's authenticity to the components and initiatives rather than a comprehensive development, a lack of oversight and healthy subjects, and both appropriate and inappropriate assessments can all contribute to repercussions on the teacher's method of instruction. When examining the structure from each country's schooling institutions, two different processes spring up.

As a result, the educational system should provide students with disabilities with the necessary intellectual process to conceivably adapt to the circumstances of constantly shifting knowledge base. On the other hand, it is important to recognize that the instructor era, as the only omnipotent and only teaching force Almighty, has ended and that and shoulder teaching, traditional methods of instruction and acquiring knowledge based solely on hypothesis, to react to the unrestricted and unforeseen fields yielded from variety shifts in human knowledge developments, no longer needs effectiveness and will not meet the requirements of our time's educational requirements. Since contemporary educators are exposed to the subconsciously learning experience beyond the school environment, educational technology and its continued development are assigned to benefit the community.

Regarding the increased understanding of students who have disabilities, their anticipated level of understanding has risen just as teachers' consciousness has, in addition to the teacher, the repository cannot serve as the only source of data regarding all of the world's science and emerging teaching aids, as well as their academic needs. The only way to address the crisis plaguing our school system is to nurture and foster a culture of instructional technology and new ideas. There is a growing interest in developing computer-based educational content for students with special learning needs in the educational research community; however, our centralized repository about how special education teachers incorporate technological tools in special education classrooms is very restricted (Seo & Bryant, 2009; Stetter & Hughes, 2010). Before creating any type of instruction, application developers must be fully aware of the requirements and competences of prospective teaching materials users (Morrison, Ross, Kemp, & Kalman, 2010). It is especially important in the context of special education, where teachers' needs, attitudes, abilities, and use of instructional technology in their classrooms have traditionally been neglected when constructing computer-supported teaching content.

### **Conclusion**

The definition of special needs and disability in the twenty first century may be requiring reconceptualization in the fold of increasing assistive and adaptable technology available for special education. Today, there are quite number of modern day learning tools that do not only accommodate people with different attributes or needs, but does well to support the pace and dynamics at which



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people learn in the classroom. Most visibly, two recent areas of critical agenda which depends on technology are inclusive education and self-employment. Unfortunately, special education in developing worlds is still far from achieving these lofty goals on the condition of limited deploring of these tools to tune of special needs and people with disabilities. Thus, proper inculcating technology into special education can break barriers and magnify their chance of self-establishment of persons with special needs and industrialization of the country at large.

Conclusion should include all accounts contained in a thesis or article including implications and recommendations not just review of literature and positions taken by the writer. In that case it should be last item of your article after implications and recommendation moreso there is no summary to cap them all.

### **Implications**

- Special Educators have to be versatile and proactive in the deployment of technology in classroom. Teachers can overcome difficult situation??? What situation by learning themselves and adopting technologies in their classrooms.
- Schools have to procure necessary assistive technologies for realizing inclusive education.
- students with special needs requier both ability and confidence with technologies to be able to catch-up with social trends, especially, for the ever expanding world of works
- In all, ICTs must be considered as both a policy approach for realizing the right to inclusive education and a tool for promoting good learning outcomes for students with disabilities. Using ICTs for education means a coordinated and comprehensive legal and policy approach that encourages and accelerates the use of inclusive ICTs in education while ensuring that technology-enabled learning does not create another form of exclusion for students with disabilities.

### **Recommendations**

- Based on the analyses provided in the paper, there is need for technology in special education. This can be achieved through instituting some important education policies to promote adaptation of technologies to classroom activities especially in the wake of global call for inclusive education.
- It is equally important to consider training and retraining of special educators given the fact that technology evolves very fast and wide. It is equally important that government in developing countries support special needs educators through sponsorship to conferences, symposia and workshop where topical issues pertaining to the applicability and adaptability of technology to special education can be shared among educators.



- It is highly recommended that government should acquire some important technologies or subsidize them for students with special needs. This can will showcase the social initiative agenda targeting youths in general. Youths who have special needs and those with disabilities would benefit from massive self-employment and industrialization agenda when they are properly trained or equipped in technology to be able contribute through production and provision of essential services within the society.
- Schools should ensure that teachers who are skilled in technologies are appointed to teach in the classroom.

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