

How Modern Technology Can Incorporate Students with Special Needs: A Theoretical Review

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ABSTRACT: It is an undoubted fact that the use of modern technology is increasing at an alarming proportion and is widely utilized in education. While there are disadvantages, there are many benefits. This paper examines how these technologies can enhance the educational capacities of children with special needs. It examines the tenets of inclusion and highlights the significance of equity, diversity and equality. Special importance is paid to inclusive syllabi and the teaching and learning. To arrive at a clear understanding of this topic this theoretical review incorporated qualitative research methods. Data revealed that the use of technology enhances cognition and affirms that all children possess competencies, and aspirations which could be accomplished in proportionate environments that foster meaningful education.

KEY WORDS: Modern technology, Special students, Inclusive education, Inclusive Syllabi, Disability, Equity, Diversity, Equality

INTRODUCTION

Inclusive education tries to ensure that all students are provided with proper learning environments that can assist them to accomplish their aspirations and fulfil their ambitions. Unsurprisingly, inclusion supports the notion that all children can learn and achieve their potential when education is worthwhile and purposeful. Thus, inclusion minimizes prejudice and emphasizes impartiality. Since the environments are secure and promote learning, students can expand their capability and be successful. Inclusion decreases inequality and ensures that everyone feels valued and supported. In adequate learning environments students must be appreciated (Corbett, Dumareq, and Tommasini, 2021). It is a fact that the use of modern technology in education continues to augment. Lomellini, et al. (2023) held the view over the last two decades, more students are enrolling in online learning, and this also includes many students who have learning disabilities. Thus, Fuentes et al. (2021) suggested that educational institutions should begin to cater to the needs of all students, even those with special needs. Fuentes et al. (2021) opined that inclusive syllabi are significant because they often underscore inclusion and appreciate diversity. This is significant because all students feel valued and appreciated within the learning environments (Germano & Nicholls, 2020). Published research indicated that there is a lack of information on this topic. This research showed how modern technology can enhance the performance of special students. It presented a synopsis of inclusion and demonstrated how modern technology can support inclusive learning environments. This research question guided the study: How can modern technologies incorporate students with special needs?

LITERATURE REVIEW

Inclusive Education: A Brief Description

Inclusive education tries to incorporate, as far as possible, all students, regardless of their background, competencies, or disabilities, so that they can learn together in the same classrooms and schools. Its chief objective is to develop welcoming and supportive learning environments for everyone. It also adapts teaching and learning to cater to the diverse needs of all learners. In this way, it ensures that all students have equal access to quality education and can augment their full potential (Hairiyanto et al., 2024; Iswadi et al., 2022). Mention must be made that proper inclusive education does not involve placing students with disabilities in mainstream classrooms alongside their peers. It is chiefly concerned about actively meaningful learning environments where all students experience genuine appreciation and are valued for their unique contributions (Tubagus et al., 2023). Since education is essential in shaping and molding individuals, teaching and learning must be meaningful to all (Sitopu et al., 2024). Inclusive education strongly recognizes and affirms that students learn in different ways and have varying needs. This means that schools need to adapt their teaching methods, curricula, and physical spaces to properly accommodate these diverse needs. This might require them to use assistive technology, modify assignments, or provide necessary support services (Aslan & Shiong, 2023; Nurdiana et al., 2023). Adequate inclusive education frequently minimizes barriers to learning pertaining to disability, language, or socioeconomic status. In doing so this dynamic learning process includes academics and involves life skills, values, morals, principles, and proper attitudes that form sound character. According to Guna et al. (2024), inclusion is beneficial to all students, and not only those with disabilities. It also sustains understanding, empathy, and respect for diversity among all students. Moreover, it also fosters a more dynamic and

enriching learning environment for everyone. Okech et al. (2021) also postulated that inclusion is a shared responsibility that involves educators, school administrators, parents, and the wider community. It also requires a commitment to creating welcoming and supportive environments for all students. These learning environments frequently provide students with the opportunity to thrive, grow and reach their full potential, regardless of their differences. Wahyuni et al. (2021) supported this notion and implied that meaningful education must be afforded to all so that students. In this way, they can augment their competencies and become better individuals. Aderoju and Owolabi (2024) conjectured that education is paramount in fostering and forming character, abilities, cognitive, academic, and non-academic achievements, and social interactions of students and inclusion embrace equality, equity, and diversity (Yekti et al., 2019; Choi, et al., 2017). Similarly, inclusion continually enhances teaching and learning, evaluates curricula, and incorporates the wider community. When this is properly achieved, it minimizes irregularity and unfairness in education and underscores the social, intellectual, and educational components of all students (Ackah-Jnr, 2020). According to Djafri and Mustopa (2024), education opportunities for all students, even those with special needs and disabilities, must be provided. The emphasis on inclusive environments does not differentiate or segregate (Dignath et al., 2022). Similarly, Sarouphim and Chartouny (2017) affirmed that inclusion embraces all students and reduces discrimination. Inclusive environments pay strong emphasis on welcoming, supporting, and affirming students in teaching and learning. To accomplish some of these goals meaningful adjustments may have to be made such as ensuring that teaching and the curricula, school facilities, and classrooms.

Singal (2024) suggested that inclusion permits all children without exception to learn together in the same classroom, and this notion upholds the philosophical thinking that underscores quality, social justice, and respect for diversity. It is also a development of integrated education programs suitable for all students. Singal (2024) further noted that inclusion effectively assists students with special needs because it elevates their dignity and self-esteem and ameliorates them to be successful in life. When their self-efficacy is heightened, they feel appreciated and their approach to life is more positive. Mutuota (2024) and Al-Korbi et al. (2024) opined that inclusive environments are not discriminatory but accept all students even those with special needs. In inclusive classrooms, students become totally involved in all aspects of school life and can develop their abilities. Thus, genuine inclusion provides students with a sense of belonging and offers a safe environment. It also promotes active listening and encourages participation. Moreover, it combats biases, focuses on boosting and maintaining the motivation of students.

Putranto (2024) and Ibda et al. (2024) also held the firm belief that inclusion permits more children with special needs to learn with their peers in conventional classrooms, and this is admirable. Although several authors argue that inclusion can decrease the number of special schools this remains a challenge because the implementation of inclusion is still in process (Baharun & Awwaliyah 2018). In this regard, Layachi and Pitchford (2024) noted that over the years several government officials have shown an interest in supporting inclusion which decreases prejudice and accentuates impartiality. Although Ainscow (2020) affirmed that concepts such as equity and inclusion should be essential in educational practices, many students with special needs cannot access inclusive environments (McLinden et al., 2023). Hence, Layachi and Pitchford (2024) conjectured that the need to accentuate inclusive and quality education should encourage educators to use different methods of approach in the delivery of the syllabi to incorporate special students. One exceptional approach is to effectively utilize modern technology. Ratheeswari (2018) supported this notion because the use of technology accentuates teaching and learning and augments abilities. This is chiefly because different technological tools demonstrate effectiveness and competency in improving the academic performance and skills of students (Chauhan, 2017; Durgungoz & Durgungoz, 2021). While research about the advantages of technology in education is continuous (Valverde-Berrocoso et al., 2022; Teng & Wang, 2021; Chauhan, 2017) current research supports educational technology since it offers options for individualized learning, by providing content and features that are adaptable to students' needs (Outhwaite & Van Herwegen, 2023). According to Duraipappah et al. (2022), in Outhwaite & Van Herwegen (2023), the use of technology in education can stimulate students to achieve their goals.

Slee et al. (2019) opined that inclusion can be instrumental in mitigating exclusion practices by designing different strategies. Selisko et al. (2024) strongly opined that because inclusion is important, educators ought to alter their teaching styles and try to promote proper attitudes that embrace inclusion. According to Selisko et al. (2024), most of these attitudes are grounded in the beliefs of educators. Fives and Buehl (2016) also noted that these beliefs are essential in trying to establish genuine inclusion since these beliefs often influence their practice. Fives and Buehl (2016), opined that educators must be aware that all students can achieve their aims and aspirations. Thus, these beliefs are important because they govern behavior, thought and inform the delivery of the syllabi. On another note, Fox et al. (2022) opined that obstacles to inclusion exist when educators do not sustain these beliefs. Navarro-Mateu et al. (2019) with Halawa and Zetmin (2024) affirmed that empathy and proper attitudes demonstrated by educators are vital in sustaining inclusion. According to Makoelle (2019) and Aldrup et al. (2022), these disciplines are vital in nurturing inclusion and must be recognized when considering the learning needs of students.

Impartiality and Special Needs

Jurado de los Santos et al. (2020) conjectured that it is very complicated and difficult to define the term impartiality. According to them, this term depends on many factors, and the chief one is the political perspectives. Impartiality in education means presenting information and perspectives in a fair, balanced, and unbiased way, especially when dealing with controversial issues. It involves ensuring that all students are exposed to a range of views and encouraged to form their own informed opinions, rather than being

influenced by a teacher's personal biases. Jurado de los Santos et al. (2020) mentioned that in 2024, several countries believed that impartiality is essential in education. This conceptualization of impartiality is based on two major factors. One affirms that quality education is necessary for all citizens, so they could augment their individual, social, intellectual, cultural, and emotional capacities. Two believes that impartiality provides opportunities where the educational community can enhance caring for the diversity of students (Jurado de los Santos et al., 2020; Shea & Sandoval (2019). Impartiality must go beyond these challenges and ensure that it provides equal opportunities (Acai et al., 2022; Perez-Felkner et al., 2020).

Simón et al. (2019) opined that impartiality in inclusion is possible when such institutions have sufficient resources. According to Irby et al. (2020) proper organization in the education system must promote routines and practices that promote educational leadership. Galloway and Ishimaru (2020) affirmed that leadership should involve the entire educational community. In this way, it can encourage transformation and address different teaching styles and ensure that the syllabi are relevant. Philip et al. (2019) further suggested that for impartiality to be effective, educators must be cognizant of the urgent need and be willing to implement and sustain meaningful strategies that minimize discrimination and affirm impartiality. They also need to encourage policymakers and the entire school community to actively engage in the fight against inequalities (Billingsley et al., 2019; Kinloch et al., 2020; Chapman & Ainscow 2019). Inclusive education must also uphold equality as one of its essential objectives. Francis et al. (2020) also believed that equity must minimize inequality and affirm academic success among students.

Impartiality affirms fairness and balance in education. This often requires educators to present different perspectives on topics even if they are controversial, without favoring one over another. Bias must be avoided so that one viewpoint is not dominant and upheld as the only correct one. There must be respect for students to feel comfortable expressing their opinions, even if they differ from others. By presenting a range of perspectives, impartiality helps students develop the ability to critically evaluate information and make their own informed judgments. Impartiality helps prevent educators from unduly influencing students' beliefs or opinions, especially on sensitive topics like politics or religion. Schools should provide clear guidance and training to educators on how to maintain impartiality and address controversial issues effectively.

Benefits of Artificial Intelligence

Diputra et al. (2020) noted that several digital devices are used in classrooms because they affirm the cognition of students especially those with special needs. Munisa et al. (2024) opined that when digital literacy is used it embraces cognitive and technical skills. Munisa et al. (2024) also mentioned that digital literacy is very significant for success in school, work, and life in general. In summary, digital literacy uses digital technologies, communication tools, and networks to seek information. It involves not only technical skills but also critical thinking, ethical considerations, and an understanding of the social and cultural contexts of digital technologies.

Chambers (2020) and Corbett et al. (2021) mentioned that because assistive technology (AT) stimulates the intelligence of students with disabilities it is important in the delivery of the syllabi. McNicholl et al. (2021) and Gregory (2018) also noted that AT tools in teaching and learning promote competencies and are beneficial for students. Hence, students are willing to learn and increase their potential. Assistive technologies such as Calendly are important in facilitating meetings with educators and students (Hooijer et al., 2021; Ismailov and Chiu, 2022; Kelly 2014)

Berente et al. (2024) opined that artificial intelligence (AI) are various technologies that allow computers to perform advanced functions. Some of these include the ability to see, comprehend and translate language, synthesize data, and offer recommendations. Berente et al. (2024) further believed artificial intelligence (AI) is rapidly transforming education. This is done by offering individualized learning experiences, automating administrative tasks, and providing data-driven insights to educators. AI tools can adapt to the needs of students, offer instant feedback, and help educators focus on meaningful interactions and dialogue. While AI is not meant to replace educators, it can significantly enhance their capabilities and create more effective and engaging learning environments. Utina et al. (2024) affirmed that AI provides individualized personalized platforms because its platforms can analyze the performance of students. Since it caters to the needs of students it is beneficial because students receive the right support in a timely manner. AI has the capacity to automate routine tasks like grading assignments, providing feedback, and tracking the progress of students. This gives educators more time to concentrate on more personalized instruction and better engage students. AI can also analyze students' data to identify learning gaps, note progress, and provide valuable insights to educators. This enables them to adapt to their teaching strategies and provide meaningful support. AI-powered tools like virtual labs, simulations, and interactive games can make learning more engaging and interactive for students. It can also assist educators in developing lesson plans, creating quizzes, and finding relevant learning resources. AI can provide instant feedback on students' work, helping them understand their strengths and weaknesses, and highlighting areas where additional support is required.

CHALLENGES WITH AI

Nguyen et al. (2023) affirmed that AI offers both opportunities and challenges in teaching and learning. Although it can personalize learning, automate tasks, and provide valuable insights, it also raises serious concerns about privacy, bias, over-reliance, and the potential loss of human interaction. According to Utina et al. (2024), AI systems frequently require access to sensitive student data. This could raise concerns about data breaches, misuse of information, and potential violations of student privacy. AI models are

trained on data, and if that data reflects existing biases, the AI system may perpetuate or even amplify those biases, potentially leading to unfair or discriminatory outcomes for certain students (Zawawi et al., 2024). According to Sain (2024), students and educators may become too reliant on AI tools. This could potentially obstruct the development of critical thinking, problem-solving, and other essential skills that require human interaction and independent thought. Although AI-powered tools offer personalized learning experiences, this may reduce face-to-face interaction between students and educators. Mention must be made that socialization forms an integral component in learning. It is also essential for social-emotional development, communication skills, and building strong teacher-student relationships (Syahrin & Akmal 2024).

Modern technology plays a crucial role in supporting individuals with special needs, by offering various tools and resources that enhance learning, communication, and independence. These advancements include assistive technologies, adaptive learning platforms, and inclusive educational practices, all contributing to greater accessibility and participation in various aspects of life. Modern technology is beneficial in the following ways: it enhances learning, increases independence and improves communication. It is also accessible and embraces inclusion. It reduces anxiety and tension among students. A noteworthy aspect of modern technology is that it makes students more independent and autonomous. They rely more on their abilities and educators can motivate them. As a result, students can choose the speed of learning that is convenient for them which leads to more personalized learning. When students do not inhibit the learning process for the whole group, it allows reducing the anxiety level which plays a significant role in education as well. Implementation of technologies in special education allows simplifying communication and improving the overall academic skills of students with disabilities.

METHODOLOGY

This study did not rely on direct observation or experimentation to gather information. It utilized literature reviews, conceptual analysis, philosophical arguments, and theoretical modeling. It also explored existing knowledge, ideas, or concepts without collecting new data through sensory experience. This theoretical review focused on only analyzing and synthesizing existing theories and models related to the topic, how modern technology can incorporate students with special needs. It also examined how different theories explain this phenomenon and identified the relationships between theories. In addition, it assessed the extent to which these theories have been investigated. In this way, it provided a comprehensive understanding of the theoretical landscape surrounding this research. This theoretical review revealed the gaps in this research, and the possible inconsistencies between theories. This can lead to the development of new hypotheses that can be tested in future empirical studies. Moreover, it offered a strong foundation for a better and clearer understanding of this research, by presenting the context, the background knowledge, and a framework for interpreting empirical findings. Data also underscored that all children have various and different abilities and ambitions, and these objectives are attainable in inclusive classrooms. The findings allowed this researcher to gain a thorough understanding of the research topic and answer the research question: How can modern technologies incorporate students with special needs?

While this theoretical review is valuable for synthesizing existing knowledge and frameworks, there can be possible potential bias, some difficulties in achieving comprehensive coverage, and various challenges in synthesizing diverse perspectives. It also lacks empirical grounding and is somewhat deficient in keeping abreast with rapidly evolving fields. It was also very challenging to cover all relevant literature on this topic, as well as reviewing a vast body of literature. This theoretical review focused on abstract concepts without grounding them in real-world data or empirical findings. It also did not incorporate different theoretical frameworks that may offer conflicting or contradictory explanations, making it challenging to integrate them into a coherent synthesis. Thus, applying theoretical frameworks across diverse contexts could lead to oversimplification or a lack of attention to specific nuances.

FINDINGS

Self-Concept and Special Students

Palenzuela-Luis et al. (2022) conjectured that children with special needs often experience changes in the physical, psychological, and behavioral aspect of their lives. Some of these include crises, emotional challenges, and difficulties with new relationships. These hindrances act contrary to the proper formation of their self-concept. According to Fhon et al. (2016), self-concept is the perception individuals have about themselves and their corresponding abilities. Fhon et al. (2016) also indicated that because self-concept is essential for the development of the identity of youth, they habitually influence how youth think, behave, and relate to their environments. According to this argument, it is imperative that all students have a sound self-concept. Tus (2020) also opined that since self-concept is intimately associated with behavior and academic performance it is vital that students develop a healthy self-concept. According to Tus (2020), self-concept forms an integral part of life. It is also necessary since it embodies the beliefs, attitudes, and views of people so it is important for students to have a sound self-concept. This can be attained through acceptance and appreciation of self and having a genuine interest in overcoming negative behaviors (Tus, 2020). Hence, Jansen et al. (2015) and Marsh et al. (2014) supported the fact that when students have a good self-concept, they are likely to accomplish their goals and objectives. This philosophy is beneficial for special students since it can challenge them to improve their abilities and attain success. Orth and Robins (2022) believed that a good self-concept helps individuals in bonding and making healthy connections with friends. In addition, Swann et al. (2007) opined that forming good relationships and experiencing higher psychological well-being assists

students in becoming more successful at school and work. Thus, solid self-esteem can be beneficial for students with special needs. Donnellan et al. (2011) and Eggen and Kauchak (2019) defined self-concept as the subjective and personal evaluation of the worth of individuals. This reflection is subjective and does not properly demonstrate the unique characteristics of individuals. Orth and Robins (2022) and Marsh et al. (2014) observed that there is a distinction between self-concept and narcissism. Ackerman et al. (2011) and Yahaya (2009) postulated that self-concept refers to feelings of self-acceptance and self-respect, and narcissism refers to feelings of superiority and self-centeredness.

The social learning theory offered by Bandura (1977a) affirmed that learning occurs through observation, imitation, and modeling and is influenced by factors such as attention, motivation, attitudes, and emotions. Thus, Bandura (1977a) can be one of the foundations of inclusive environments principally because students can learn from others. This social learning theory teaches that observation and imitation are intimately linked and relevant to learning. This is significant in inclusive classrooms, because students can observe the good behavior of peers and imitate healthy and productive habits (Byrne, 1996; Calsyn & Kenny, 1977; Ercikan et al., 2005; Sarouphim & Chartouny, 2017).

It is instructive to note that Bandura's (1977b) social learning theory also emphasizes that learning occurs through observation, imitation, and modeling behaviors. This theory highlights the connection between cognitive, behavioral, and environmental factors in learning. Through observation individuals learn by noting the actions of others, including their successes and failures. This occurs either directly through social interactions or indirectly through the media. Some of the key factors in observation are attention, retention, reproduction and motivation.

According to Bandura (1977b), self-concept is essential in social Learning because it focuses on the beliefs and the ability that individuals have to succeed. This belief, or self-concept, significantly impacts motivation, behavior, and overall well-being. People with high self-concept are more likely to persevere in the face of challenges and achieve their goals, while those with low self-concept may avoid tasks or give up easily. On the other hand, Marsh et al. (2005) and Skaalvik & Valås, (1999) offered a different view. Their conclusions stated that self-concept relates to issues such as the strategies that students utilize, the goals they establish, and their academic achievements.

Although Bandura's social learning theory is influential, it has limitations. It's criticized for potentially overemphasizing the role of observation and imitation while underplaying internal cognitive and emotional factors. Additionally, the theory doesn't always account for individual differences in personality and past experiences, and measuring the mental processes involved in observational learning can be challenging.

DISCUSSION

Inclusive Syllabi

According to Moore, Brantmeir, and Brocheild (2017) inclusive syllabi are learner-centered and focus on learners by clearly communicating what students will do, and how the course and the educators can facilitate their academic success and thrive. The following govern inclusive syllabi warm, supporting, and caring. Inclusive syllabi are various course outlines that create welcoming and equitable learning environments for all students (Columbia Center for Teaching and Learning, 2021; Fuentes et al., 2021). Inclusive syllabi focus on fostering a sense of belonging and valuing the diverse backgrounds and experiences of students. Inclusive syllabi constantly try to create a solid and positive impression. Thus, they use language and words that are inviting and motivating and always avoid punitive or demanding language. A noteworthy aspect of the syllabi is that they underscore diversity, that is all course upholds diversity, equity, and inclusion (DEI) and recognizing that students bring a variety of perspectives and experiences. In addition, the syllabus is easy to understand and access, with clear explanations of course policies, expectations, and resources.

As mentioned earlier, inclusive syllabi create welcoming and equitable learning environments for all students by incorporating strategies that acknowledge and value diverse backgrounds, identities, and learning needs. Inclusive syllabi emphasize student-centered learning using clear, invitational language, and providing accessible information and resources. Although inclusive syllabi are beneficial, there are some limitations. These include potential resistance to change from educators or institutions, and the challenge of accurately representing diverse student needs. Additionally, even with an inclusive syllabus, unconscious biases in teaching practices can still negatively impact students. To overcome some of these limitations educators should focus on creating a welcoming and supportive learning environment by using clear language, providing diverse content, and offering flexible policies. This includes adopting universal design principles, considering accessibility needs, and fostering a sense of community and belonging.

CONCLUSION

The findings revealed that modern technology can be beneficial for students with disabilities and this is affirmed by Gregory (2018) and Kelly (2014). The findings also noted that students ought to be afforded with equal opportunities to develop their autonomy and competencies. The delivery of the syllabi will be enhanced, and cognition will be augmented. Supplementary aids and services (SaS) also assist students to be engaged in learning. In addition, genuine learning environments foster and develop the self-concept of students. This motivates them to be fearless in embracing challenges. They are not easily intimidated but use difficulties to attain

success. Inclusive environments embody diversity, equity, and equality in the classrooms. Because they are student-centered, they build character and good self-esteem among students.

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