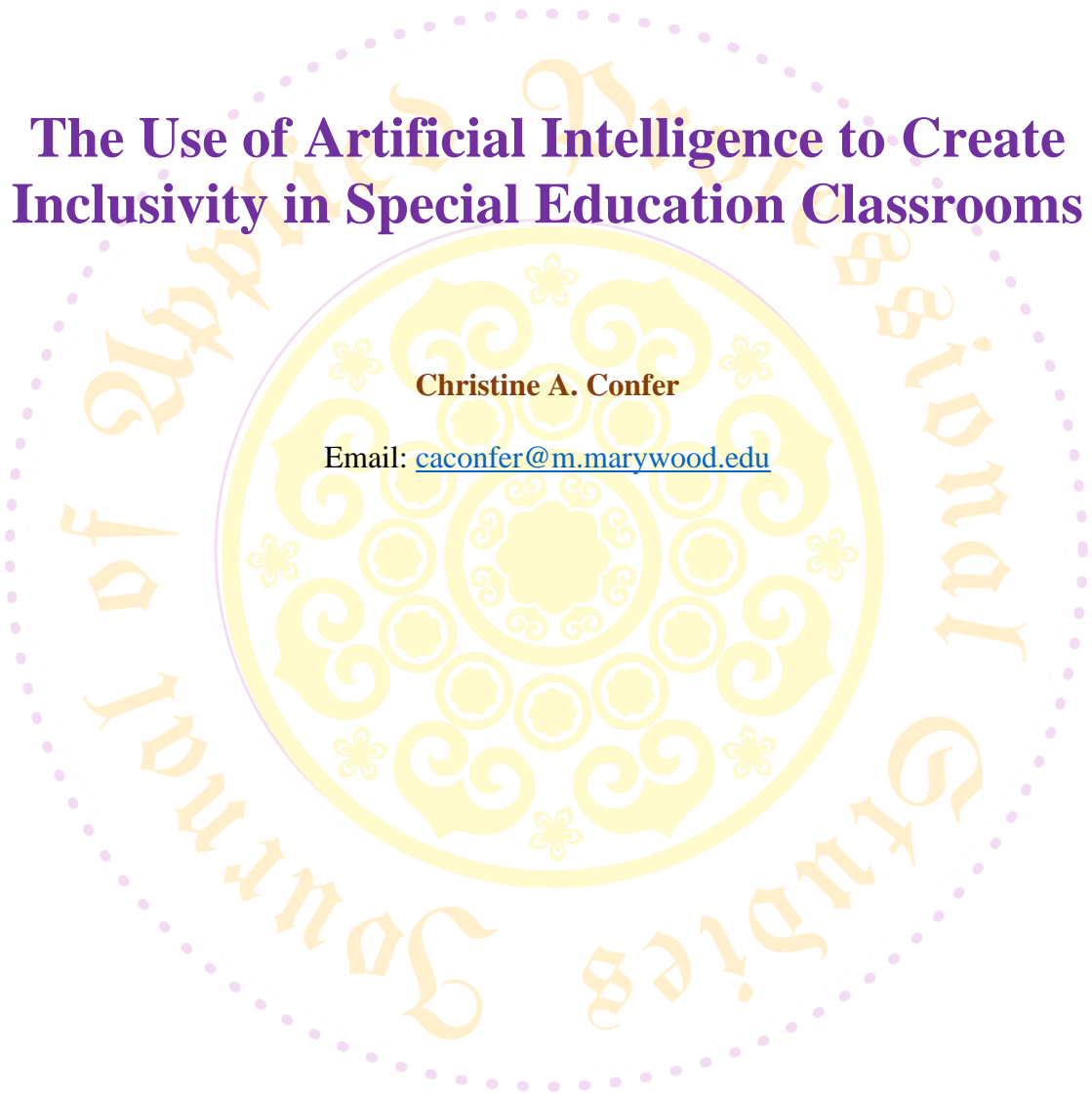


The Use of Artificial Intelligence to Create Inclusivity in Special Education Classrooms

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Abstract

Special Education is defined as specially planned instruction that meets the needs of students with special needs and disabilities. Special needs is a term that relates to specific learning disabilities, and disability is a term that relates to physical and mental inabilities. In Education, and for the purposes of this paper, the terms are used interchangeably. Prior to the late 1960s and early 1970s, students with special needs did not have the right to special Education in the United States. Through parental advocacy groups, creation of laws began to emerge to protect students' rights to fare and appropriate Education. However, despite the legislation, the association of stigmas with inclusive Education continues to cause debate among those who support the idea that students with special needs have a right to quality education delivered by special education instructors in separate classrooms and those who support the idea that all students should have the opportunity to learn together in inclusive classrooms. The attitudes toward inclusive Education, comprehensive teaching practices, and resources are essential factors for implementing inclusion in classrooms.

The rise of Artificial Intelligence (AI) is minimizing stigmas by promoting equality and individualized learning. AI focuses on areas of development to support students with special needs and therefore enables them to compete with their peers in regular classrooms. Research suggests AI can identify learning difficulties that may lead to students obtaining a diagnosis and receiving tailored support in a timelier manner. AI supports students with special needs in various categories, such as reading, writing, spelling, and math skills. As parents, students, and educators gain interest in the potential of AI in Education, there are still ethical concerns regarding the use of AI. Studies show that 89% of parents and 85% of students support having clear school guidelines on AI technologies. Despite the concerns, AI continues to increase classroom inclusivity and enables all students to attain academic achievement.

Keywords: advocacy, artificial intelligence, disability, education, inclusivity, Individuals with Disabilities Education Act, special needs, stigmas

Introduction

Special education is a specifically designed instruction that meets the unique needs of students with identified learning disabilities (Understanding the 13 Categories of Special Education, 2016). As an individualized approach tailored to meet students' needs, special education provides the resources students need to progress in school. Individual student services and support may differ greatly from the support required by other students (Morin, 2023). Therefore, students who qualify for special education are provided an Individualized Education Plan (IEP), modified instruction, and other resources at no cost to families (Morin, 2023). Learning specialists are also available to assist students with developing their unique strengths to address student challenges (Morin, 2023).

The Individuals with Disabilities Education Act (IDEA) is the federal law that outlines and regulates special education (Morin, 2023). The IDEA requires public schools to deliver services in special education to children ages 3 to 21 who meet specific conditions (Morin, 2023). According to the IDEA, students must have a documented disability in one of the 13 recorded categories covered by IDEA, such as Autism, Blindness, Deafness, Emotional Disturbance, Hearing Impairment, Intellectual Disability, Multiple Disabilities, Orthopedic Impairment, Other health impairment, Specific Learning Disability, Speech or Language Impairment, Traumatic Brain Injury or Visual Impairment (Understanding the 13 Categories of Special Education, 2016). Students must also require special education to access the general education curriculum (Morin, 2023).

Access is an important term in education (Morin, 2023). Access to education entails making information readily available and easy to understand for all types of students. Access permits students with disabilities to develop the same skills and achieve the same level of knowledge as peers. Finding ways to remove barriers to educating students with special needs entails more learning accessibility (Morin, 2023). While special education makes it possible for children to succeed in the least restrictive environment despite their disability by providing a free appropriate education (FAPE), appropriate does not necessarily mean best (Understanding the 13 Categories of Special Education, 2016). Barriers to inclusive education impacts education for students with special educational needs (Qu, 2021).

Students with disabilities are often socially ostracized by parents and other students due to attitudes of fear, ignorance, lack of awareness, and traditional prejudices (Dua & Dua, 2017). Why do stigmas emerge, and what gives stigmas momentum to grow and continue despite efforts to curb them? Providing a holistic learning environment that promotes equality and individualized learning, focusing on areas of improvement, helps students with special needs to compete with others and enables students more opportunities for successful performance and to prove their worth (Samuels, 2019). The common goal of inclusion for students with special needs education has been receiving increased recognition globally (Qu, 2021).

With the rise of Artificial Intelligence (AI), inclusive learning is becoming a reality and exposing the world to diversity (Samuels, 2019). AI may provide students with special needs opportunities to be included in social activities and presented with the same opportunities as other students without disabilities (Samuels, 2019). This article examines the stigmas associated with inclusive education for students with special educational needs and how emerging artificial intelligence can provide opportunities to promote equality and individualized learning that focuses on areas of development to support students with special needs to compete with their peers (Samuels, 2019).

History of Special Education in the United States

Since the establishment of the United States in 1776, until the late 1960s and early 1970s, little had been done to advance the rights of students with disabilities (Staff, 2023). Before 1961, students with special needs did not have the right to special education in the United States (Arkansas State University, 2016). Over 4.5 million students were denied an adequate education (Staff, 2023). Students with emotional disabilities, deafness, blindness, or needing speech therapy

were educated at home by their parents, or their parents had to pay for private education (Arkansas State University, 2016).

After World War 2, America began to pay more attention to the need for improved conditions for people with disabilities (Special Education (IDEA), 2023). Grassroots parent groups suddenly began forming to advocate, eventually leading to future legislation (Special Education (IDEA), 2023). In 1947, the American Association of Mental Deficiency was one of the first parent organizations to form to advocate for people with disabilities (Special Education (IDEA), 2023). By the early 1950s, several national parent groups had begun to form, such as the United Cerebral Palsy Association, the Muscular Dystrophy Association, and the Association for Retarded Citizens of the United States (ARC) (Special Education (IDEA), 2023).

In 1961, President John F. Kennedy, inspired by his sister Rosemary who had a disability, created the President's Panel on Mental Retardation (Special Education (IDEA), 2023). The panel's recommendations included federal aid to states (The History of Special Education in the United States | SpecialEdNews. n.d.). In 1965, Lyndon B. Johnson signed the Elementary and Secondary Education Act. The act provided funding for primary education and was viewed by advocacy groups as increasing access to public education for children with disabilities (The History of Special Education in the United States | SpecialEdNews. n.d.). The acts would eventually lead to more legislation for special education services.

Often referred to as the Foundational Years, the 1970s significantly improved students' lives more than any other decade in the history of special education (Staff, 2023). In the early 1970s, only 20% of students with disabilities were served in the public school system (US Department of Education, Office of Special Education and Rehabilitative Services, 2010). During this time, services were minimal and provided in segregated settings (US Department of Education, Office of Special Education and Rehabilitative Services, 2010). Many students with disabilities were excluded from the education system (US Department of Education, Office of Special Education and Rehabilitative Services, 2010). However, legislation to ensure educational opportunities for students with special needs soon followed (Staff, 2023). Once legislation began, a steady stream of directives, laws, and decisions offered students with special needs opportunities that had been previously nonexistent (Staff, 2023). Suddenly, independent living became an option through the foundation of quality, individualized education within an accepting and unrestrictive environment (Staff, 2023).

The Rehabilitation Act of 1973 ensured civil rights to all people with disabilities and required accommodations for students with disabilities in school (Staff, 2023). In 1975, the Education for All Handicapped Children Act was enacted (Arkansas State University, 2016). The act led to federal funding to assist schools with creating special education for students who learned differently than typically developing students (Arkansas State University, 2016).

In 1997 the EHA underwent several revisions (Staff, 2023). The act became known as the Individuals with Disabilities Education Act (IDEA) of 2004 (Arkansas State University, 2016). The creation of IDEA brought widespread awareness of providing the best-researched, most effective methods for special education instruction (Staff, 2023). Students were guaranteed access to equal education and equipped with attainable schooling options and the individualized attention

they needed (Staff, 2023). Access to special education ensures that all students have a choice and share their voices (Arkansas State University, 2016). The act has been revised many times to integrate what schools and families learn best to serve students (Arkansas State University, 2016).

The IDEA stresses using individual education plans, or IEPs, for all students with special education needs (Staff, 2023). The IDEA also introduced individualized transition plans, or ITPs, to prepare students for success in their adult lives (Staff, 2023). The IDEA states that schools must provide appropriate education to all students in the least restrictive environment possible (Arkansas State University, 2016). The act protects the rights of students to learn in diverse classrooms where every student has something different to offer to support true microcosms of the outside world, encouraging all students to treat everyone with respect (Arkansas State University, 2016). The United States has moved away from keeping all students with disabilities in isolated classrooms. It has promoted integrating students with special needs into inclusive classrooms that provide children of all abilities with the environment to learn and grow with each other (Arkansas State University, 2016). Inclusive education entails educating students with disabilities within general education classrooms in conjunction with students without disabilities (Kart & Kart, 2021). The decisions altered the landscape of special education in the United States (Staff, 2023).

Every five years, the IDEA is updated (Staff, 2023). The most recent iteration was in 2004 (Staff, 2023). IDEA is constantly updated to allow the Learning Disabilities Association of America (LDA) to see how the law operates in practice and what may be needed to ensure it is clearer, more efficient, and more effective (Staff, 2023). Previously, schools had to wait until a student fell behind a grade level before being eligible for special education (Staff, 2023). However, with the release of the final regulations of IDEA 2004, school districts are not required to follow this model. Schools can intervene more fittingly and find other ways to determine if a child needs help (Staff, 2023).

Through a dual purpose of providing exclusive opportunities in education to meet the needs of students with disabilities in the "least restrictive environment" possible, the IDEA continues to be the foundation of modern-day special education in the United States (Staff, 2023). These hard-won victories culminate decades of advocacy and dedication that built the rich selection of special education resources used in classrooms nationwide.

Since forming advocacy groups, parents continue to advocate for securing public education for their children with special needs (Arkansas State University, 2016). With basic rights in place, advocacy groups like those first started in the 1940s continue to work toward the enactment of legislation (Staff, 2023). Advocacy groups focus on various goals regarding teaching methods, recognizing certain disabilities, and greater choice in schools (Staff, 2023).

Organized in 1963, the Learning Disabilities Association of America (LDA) is one of the national networks, who continues to operate through awakenments, advocacy, empowerment, education, services and collaborative efforts (Learning Disabilities Association of America, 2022). With 14,000 national state and local members including individuals with learning disabilities, their families, and the professionals who collaborate with the organization, LDA remains dedicated to identifying causes and promoting prevention of learning disabilities as well as enhancing the quality of life for all individuals with learning disabilities and their families (Learning Disabilities

Association of America, 2022). The LDA advocates for effective identification and interventions, fosters research and protects the rights of individuals with disabilities under the law (Learning Disabilities Association of America, 2022). Irrespective of the direction, educators, lawmakers, and advocacy groups continue reorganizing disability classifications while the public becomes more educated on politically correct terminology.

According to Lazic (2023), there are currently 7.2 million students with special needs in the United States, making up 15% of all public-school students across the US. In the 2009-2010 school year, the percentage was 13% (Lazic, 2023). Lazic (2023) contends that 95.2% of school-age students served under IDEA are enrolled in regular classrooms.

While the states began providing special education resources and schooling to students in the early 1970s (Staff, 2023), the federal government allocated 17.1 billion for special education in 2002 (Lazic, 2023). Today, the state and local institutions provide 91% of special education funding, while federal funds provide the remaining 9% when states meet the national criteria (Staff, 2023). Despite the national attention toward funding and special education inclusion inspired by social justice ideology and action, implementing practices to promote inclusive dedication in classrooms face several challenges, mainly due to the stigma surrounding people with disabilities (Leijen & Baucal, 2021).

History of Stigma in the United States

Research reveals an association between childhood disability and socioeconomic disadvantage (Spencer et al., 2015). Children with disabilities are more likely to come from disadvantaged backgrounds (Spencer et al., 2015). Children with socioeconomic disadvantages are also more likely to exhibit delays in educational and occupation achievement in adulthood (Chatzitheochari et al., 2022). Despite theoretical shifts toward sociological models of disability, the formation of these inequalities remains largely overlooked within mainstream experimental sociology and life-course research (Chatzitheochari & Platt, 2019).

The United Nations Convention on the Rights of Persons with Disabilities (UN CRPD) places importance on the education system: ensuring access to all mainstream schools and the promotion of learning and well-being within the classroom, independent of any disability (Paseka & Schwab, 2019). Inclusive schooling has become a shared policy in European countries; however, its implementation varies widely between countries (Schwab, 2019). The policy also varies within the same country according to legislation, inclusion settings, financial support, access to inclusive schools, and academic concepts (Schwab, 2019). In order to achieve inclusion, an inclusive education system, and inclusive teaching and learning methods must be established (Paseka & Schwab, 2019). However, the definition of 'inclusive' has changed within the last decade (Paseka & Schwab, 2019).

Initially, the UN Convention focused on students with disabilities, their needs, and how to support them in order to include them in mainstream schools (Paseka & Schwab, 2019). Later policy began encompassing all learners (Paseka & Schwab, 2019). In this context, a paradigm shift took place, emphasizing the organizations, asking how they produce barriers to inclusion and how schools can ensure all student's education equality (European Parliament, 2017). To support inclusion, schools

often receive general funding for students with special educational needs who have a diagnosis (Paseka & Schwab, 2019). The amount of these resources and the way to request them differs according to the respective Federal State legislation (Paseka & Schwab, 2019). Additionally, schools are quite independent in how given resources are used (Klemm, 2015).

Despite the push for classroom inclusion, there continues to be stigmas associated with special education (Friendship Circle/Resources, 2023). Stigma can dramatically affect the life chances of students with special needs by compromising further positionings and self-efficacy (Link & Phelan, 2001). Lived experiences of stigma among children with special needs remain understudied (McLaughlin, 2017), with most sociological studies focusing on parental perspectives (Gray, 2002). The UN CRPD was one of the starting points for implementing the idea of inclusion in all areas of society worldwide (Paseka & Schwab, 2019).

In the 1950s through the 1970s, students with special needs were sent to special schools or the basement of regular schools (Friendship Circle/Resources, 2023). The exclusion created a stigma derived from fear of the unknown and fear of not understanding the real needs of the students within these classrooms (Friendship Circle/Resources, 2023). The fear of the unknown is often cited as the root of resistance to inclusion (Croll & Moses, 2000).

Psychological science attributes "specific phobia" and "anxiety disorder" to fear of contamination from other people, as seen in a social as well as individual state (American Psychiatric Association, 2013). Social psychology views irrationality as the root cause of social stereotyping (Robinson & Goodey, 2017). According to Goodey (2011), "inclusion phobia" has recently been framed to account for the conceptualization of learning disability. However, Robinson & Goodey (2017) describes inclusion phobia as focusing on an ultimate, theoretically extreme out-group for whom discrimination and segregation are justifiable by general societal agreement on objective grounds (Robinson & Goodey, 2017).

Two opposing discourses regarding inclusive education are the notions that "inclusion for some" signifies the idea that students with special needs have a right to the highest quality education delivered by specially trained staff and that "inclusion for all" represents the idea that all students with their diverse needs should be provided the opportunity to learn together (Leijen & Baucal, 2021). The arguments of each narrative speak to the position of students with and without special needs and their teachers (Leijen & Baucal, 2021). Several articles published in 2020 in the Estonian national newspaper argue that inclusive education is a dream or ideology that does not consider the actual circumstances or reality (Leijen & Baucal, 2021).

According to Ehala (2020), a recent study shows that individual abilities and home background can explain 80% of children's knowledge and skills and only 20% of the influence of school. A university professor argued that children with physical disabilities could be included, but it is challenging to have children raised according to very different principles or with significant cognitive disabilities (Ehala, 2020). The professor concluded that inclusive education would only be possible in societies that are very standardized, most importantly regarding child-raising practices and family values (Ehala, 2020). As a result, there would be fewer differences between children's behavior and the use of similar norms and regulations (Ehala, 2020).

The professor contended that inclusive education is a mirage created by a sense of justice (Ehala, 2020). However, the establishment places young people in a learning environment that could be more cohesive with their home preparation and developmental needs (Ehala, 2020). Therefore, the professor concluded that there need to be different kinds of environments for additional children (Ehala, 2020). Vocalizing their criticism of the recent policy reform related to inclusive education, many teachers express concern about the learning process and outcomes of typically developing students and, on the other hand, their preparation to support students with special needs (Leijen & Baucal, 2021).

Specialized knowledge and expert skills are required when working with students with special needs. Teachers need be prepared to meet their needs (Leijen & Baucal, 2021). Many argue that specialized learning environments greatly benefit student development (Leijen & Baucal, 2021). Special Education teachers have experience, knowledge, and skills for preparing specific educational experiences to maximize each student's potential (Leijen & Baucal, 2021). Inclusive classes include students with vast diversity in educational needs (Paseka & Schwab, 2019). Prior research indicates that different teaching practices are needed within inclusive schooling (Paseka & Schwab, 2019).

According to Werning and Arndt (2015), there are ten criteria for good instruction and education within inclusive classrooms:: defining aims and criteria for success, dividing tasks into several steps, adapting tasks according to the students' resources and needs, offering differentiated materials, controlling performance steadily, giving content-based feedback, providing learning strategies, offering exercises and repetition, using interactive forms of cooperation, and giving additional tasks. Tjernberg and Mattson (2014) stress that inclusive teaching practices require more personalized instruction and a large variety of diversity and cooperation to be implemented successfully. Personalization means teachers can see their students as individuals and find ways to access them (Paseka & Schwab, 2019). Indicators are the teachers' ability to recognize and support students' strengths (Paseka & Schwab, 2019).

The attitudes toward inclusive education, inclusive teaching practices and resources are essential factors for implementing inclusion (Paseka & Schwab, 2019). According to Allport (1935), attitudes can be understood as a mental and neural state of readiness, organized through experience, employing a directive or energetic influence upon the student's response to all objects and situations to which it is related' (Paseka & Schwab, 2019). In the implementation process, various groups of players are involved: students, professionals (class teachers, special needs teachers, psychologists), school management, external support groups (like social and youth welfare and leisure facilities), and, of course, parents who have – in many countries – the right to choose a school for their child (Paseka & Schwab, 2019).

However, there are differences between these groups concerning the concrete implementation and the current situation (Paseka & Schwab, 2019). Research regarding parents' attitudes toward inclusive learning reveals that parents generally have a positive or at least neutral attitude toward inclusive education (Paseka & Schwab, 2019). The results aligned with other groups, especially teachers (Paseka & Schwab, 2019).

Regarding research about parents' attitudes, the studies concluded that parents generally have a positive or neutral attitude toward inclusive education. The results align with the other groups, especially the teachers (Paseka & Schwab, 2019). The differences between parents in general concern two attitudes: 1. parents' attitudes are more positive if they are educated to a higher level and have already experienced inclusive education, and 2. Parents' attitudes differ dependent on the type of disability (Paseka & Schwab, 2019), Inclusion for children with physical and sensory disabilities is highly supported; however, inclusion for children with behavioral problems and severe cognitive disabilities is considered more skeptical (Avramidis & Norwich, 2002). Next to attitudes, teaching practices and available resources can be listed as crucial key factors of successful inclusion (Paseka & Schwab, 2019).

According to Kauffman & Hornby (2020), criticism of inclusive education ideology has also been presented in international literature. The contention is that appropriate instruction is the most important education task for all students, including those with disabilities. Kauffman & Hornby (2020) acknowledge the importance of special education and teachers with special training rather than a one size fits all model in making effective instruction possible for all students.

Opponents of inclusion argue that students in separate special education classrooms acquire individualized skills and attention because of the special educator's training, the IEP-driven curriculum, and the opportunities for practice in a more protected setting (Indiana Teachers of Tomorrow, 2020). Opponents believe that teachers need more challenges in teaching an increasingly diverse population of typically developing students and that adding students with special needs into an already overburdened system lessens the effectiveness of the education all students receive (Indiana Teachers of Tomorrow, 2020). Opponents worry about the added stress and pressure that students with special needs face in regular classrooms due to comparing themselves and their classroom performance to their non-disabled peers (Indiana Teachers of Tomorrow, 2020). Opponents argue that the support for inclusion is motivated by cost, as opposed to a more effective method of serving students with special needs (Indiana Teachers of Tomorrow, 2020).

Proponents of classroom inclusion contend that research indicates that students with disabilities have performed better on test scores, or at the very least not worse when they are integrated within the regular education classroom (Indiana Teachers of Tomorrow, 2020). Students with special needs should be able to learn social skills with non-disabled peers. At the same time, those peers also grow to accept the human difference (Indiana Teachers of Tomorrow, 2020). Proponents warn that pulling students out of regular classrooms denies them access to the same curriculum offered to their peers and that the stigmas surrounding segregated special education classes are avoided when all students are educated in the same classrooms (Indiana Teachers of Tomorrow, 2020).

Advocating for the legal protection for students with special needs by insisting that people with disabilities be viewed as a minority group, proponents contend that living and learning in the mainstream of school and community is a basic right for all students, including those with special education requirements (Indiana Teachers of Tomorrow, 2020). Those voices who argue for creating different learning environments for students, including scholars, policymakers, teachers, and parents who are in favor of inclusion for all, contend that all children in society should have an equal right to receive adequate opportunities to develop well-being, agency, identities, and

competencies to become capable of participating full and equally in a community (Felder, 2019). Educators inspired by social constructivist approaches to learning support inclusive education because they believe that child development depends not only on inherited capacities but also on shared social values, access to educational institutions, technologies, and other relevant social resources (Leijen & Baucal, 2021).

In order to create an equal opportunity for all students, all students need to be educated in regular education classrooms with conditions, capacities, and resources to adapt to student's needs, capacities, and constraints (Leijen & Baucal, 2021). However, the misalignment of teachers, discourses, practices, and technologies with the needs of some students should not be an acceptable reason for the exclusion of the student (Farrell, 2010). Education must be adapted to the developmental and learning needs of the students (Farrell, 2010). With the use of adaptive technology, many believe classrooms can be more inclusive to meet the needs of all students

Artificial Intelligence

According to Ojha (2002), Artificial Intelligence (AI) is the study and development of "intelligence agents" that can perceive environments and take actions that increase the possibilities of success. AI has been an actively pursued area of research for 50 years (Ojha, 2022). AI techniques have been progressively utilized to improve the life of individuals with special needs, from difficulties with learning, cognition, communication, behavior, emotion, sensory & physical development (Ojha, 2022). The fact that all children do not progress at the same rate and each child has different strengths and needs (Department for Education, 2001) highlights the importance of understanding the settings in which AI is best used, such as availability, training to use, and need (Ojha, 2022). AI enables the development of collaborative, interactive environments and, through powered innovations, creates new possibilities regardless of how students listen, speak, or write (Ojha, 2022).

The emergence of Artificial Intelligence (AI)- based technologies are changing the landscape of equality and personalized learning (Fourtané, 2021). AI and other technologies are opening the doors of education to all (Fourtané, 2021). With the encouragement and support of curiosity, creativity, and collaboration, students become global learners (Fourtané, 2021).

A study conducted by Stanford University on Artificial Intelligence and Life in 2023 reveals how interactive machine tutors are matched to students for more focused and personalized learning experiences (Fourtané, 2021). Integrating technology into the education system is not a new concept (Lynch, 2022a). Computer technology has and will continue to play a significant part in classrooms (Lynch, 2022a). For students with special needs, the advancement of technology is reshaping the entire education experience (Lynch, 2022a). Through the diverse levels of engagement and learning capabilities with teaching methods needed by students with special needs, Artificial Intelligence entails a highly personalized approach to teaching that can acclimate to each student's particular needs (Lynch, 2022a).

AI's adaptivity enables students to reach their full potential by focusing on specific problem areas and complementing traditional teaching methods (Lynch, 2022a). AI may provide teachers with a new, exciting assistant (Lynch, 2022a). Since no other students can access the same application

concurrently, students cannot compare themselves to one another, creating more self-confidence (Lynch, 2022). Students with special needs are also more likely to engage with AI due to the numerous stimuli associated with computer technology (Lynch, 2022a).

AI influences students who need special education (Koksal, 2018). Most students with special needs have some impairments in social skills like language and communication or difficulty with reaching, writing, and math (Koksal, 2018). The traditional one size fits all approach does not apply to students with special needs (Koksal, 2018). For example, autism is a spectrum in which students diagnosed with autism are very different from each other in their impairments and social skills. Due to their uniqueness, education for students on the spectrum will need to look different from each other to be effective (Koksal, 2018). While developing fully intelligent education tools and new virtual teaching assistants will take time, the current technological advancements have already been making positive changes in special education (Koksal, 2018).

First, educative applications with AI are more personalized and entertaining for students rather than just for educational purposes (Koksal, 2018). Students engage in learning at their own pace and in a fun way (Koksal, 2018). Technology may also assist students with comprehension to enable more effective learning rather than just being in school (Koksal, 2018). Studies show that AI-based educative applications encompass attention and increase the duration of concentration (Koksal, 2018). AI-based special education applications are utilizing games, creating better educational materials, and getting results with great effect (Koksal, 2018). AI-based special education applications save time, improve students' lives, are less expensive than therapy sessions, and provide a much better experience for students with special needs (Koksal, 2018).

AI may also improve the accuracy of assessments to identify students with disabilities (Lynch, 2023). Teachers' diagnostic reasoning skills are essential for increasing diversity and classroom collection (Sailer M. et al., 2022). Students have various and changing learning basics that teachers must consider in order to offer individual support (Reinke et al., 2011). However, there are indications that diagnostic reasoning is often neglected in teacher education and that teachers consider their diagnostic skills insufficient (Poznanski et al., 2021).

One hopeful option to overcome the gap between education and practice is to provide pre-service teachers (students enrolled in a teacher preparation program who must complete degree requirements including course work and field experience before being awarded a teaching license) with simulation-based learning opportunities, less overwhelming than real-life situations, by detecting skills early on in professional learning (Chernikova et al., 2020). Specifically, due to the complexity involved in simulation-based learning of diagnostic reasoning, students may need specific support and feedback to fully use learning opportunities (Kiesewetter et al., 2020).

Collaborative learning situations are another educational approach to simulation-based learning (Csanadi et al., 2021). Existing studies concluded that, compared to individuals, collaborative learners often perform better in solving reasoning problems in simulated scenarios (Csanadi et al., 2021). Moreover, students appear to perform better in critically evaluating others' arguments than their arguments (Mercier & Sperber, 2017), suggesting collaborative scenarios may benefit learning complex diagnostic tasks (Sailer M. et al., 2022).

According to Morrison (2022), artificial intelligence helps teachers identify which students have learning difficulties. Sailer M. et al. (2022) conducted a study on the effects of automatic adaptive feedback, based on artificial neural networks, on pre-service teachers' diagnostic reasoning (Sailer M. et al., 2022). When comparing automatic adaptive feedback with static feedback, the results showed that adaptive feedback facilitates reserve teachers' quality of justifications in written assignments but not their diagnostic accuracy (Sailer M. et al., 2022). Teachers can make more accurate assessments of learning difficulties such as dyslexia and ADHD (Attention-Deficit / Hyperactivity Disorder) if they are provided AI-generated feedback rather than an "expert solution" written by a qualified professional (Morrison, 2022). AI has shown more accuracy than humans in identifying students with disabilities due to the ability to objectively analyze large amounts of data (Lynch, 2023).

The research suggests that AI may improve teachers' ability to spot and provide evidence for learning difficulties, which may lead to students being able to get diagnosed and receive tailored support faster (Morrison, 2022). As a result, AI is beginning to impact the instruction methods for students with disabilities (Lynch, 2023). In a recent study, AI was utilized to measure the success of different teaching methods for students with disability (Lynch, 2023). The student revealed that AI matched students more accurately with the teaching methods that would be most beneficial (Lynch, 2023). Researchers believe that because the AI analyzed the teacher's work, it was easier for the teacher to understand than a "model answer" prepared beforehand (Morrison, 2022).

There are three main measures of teaching performance: student test-based measures (ex: value added), classroom observations, and student surveys (Bacjer-Hicks, A. et al., 2017). Value-added measures aim to determine how much of students; academic progress from one year to the next is attributable to the instructor instead of factors outside the instructor's control. While value-added measures are often met with skepticism due to the bias regarding how value is calculated, the value has been a part of educator performance reviews for decades (Bacjer-Hicks, A. et al., 2017). AI helps counter the difficulty of providing value-added instruction for every student in the classroom by providing the rich quality of education that parents expect, and learners deserve (Bacjer-Hicks, A. et al., 2017).

The tools of a curriculum and a timeline assist educators with setting goals to instruct every student, providing at least one year of academic value, regardless of where they are in the learning continuum and only have nine months to achieve it (Bacjer-Hicks, A. et al., 2017). To achieve this goal, educators must customize lessons for every student in the classroom (Bacjer-Hicks, A. et al., 2017). AI is the only way to scale customized instruction (Bacjer-Hicks, A. et al., 2017). AI provides instruction programs that can adapt independently in response to adaptive learner needs and increase assignment in rigor as learning moves forward in the curriculum, provide (Bacjer-Hicks, A. et al., 2017). Artificial intelligence makes determinations about instruction and grading independently (Bacjer-Hicks, A. et al., 2017).

AI enables educators to evaluate data analytics (the information every learner produces about their learning progression) (Bacjer-Hicks, A. et al., 2017). As learners engage in simulated learning and gamification, AI develops analytics that determines how behavior affects learning (Bacjer-Hicks, A. et al., 2017). Game analytics predict how time on task, answer validations, and even at-risk indicators can affect value outcomes (Bacjer-Hicks, A. et al., 2017). Universities have used AI

analytics regarding behavior (Bacjer-Hicks, A. et al., 2017). The data informs when to intervene before their students become dropouts (Bacjer-Hicks, A. et al., 2017). As a result, enrollment has increased, and grades have improved (Bacjer-Hicks, A. et al., 2017).

AI tools provide support for students with special needs in various categories. For example, students diagnosed with dyslexia, a common neurological-based developmental delay that causes problems in reading, writing, and spelling, can benefit from AI tools (Ojha, 2022). According to Kohli et al. (2010), there is a systematic approach for identifying dyslexia at an early stage by using an artificial neural network. Melis et al. (2001) introduced ActiveMath, a web-based intelligent tutoring system for math, which enables students to learn in their environment (Ojha, 2022). ActiveMath utilizes several AI techniques to realize adaptive course generation, student modeling, feedback, and interactive exercises (Ojha, 2022). Chen et al. 2008 have designed an intelligent tutoring system- (ITS) for students learning algebra equation solving. The type of Intelligent Tutoring System (ITS) used in this method is known as 'cognitive tutors' who pose authentic problems to students and emphasize learning by doing (Ojha, 2022). Intelligent Tutoring System (ITS) is more effective than traditional teaching tools. (Xian, W., et., al., 2020).

Students diagnosed with ADHD experience a wide range of difficulties that become apparent during the development period, characterized by a set of behavior problems of inattention, hyperactivity, and impulsivity or a combination (Ojha, 2022). AI has offered some improved diagnostic and intervention tools for students with ADHD, such as a neuro-sky mindset which can detect attention levels in an assessment exercise, as presented by Rebolledo-Mendez and Freitas (Ojha, 2022). Neurosky consists of a headset with three electrodes, which are put beneath the ears & on the forehead (Ojha, 2022). The electrical signals are read at the above locations as input by Neurosky algorithms to assess the attention levels (Ojha, 2022). An AI-driven Avtaar was also designed to pose questions & have limited conversations with the users (Ojha, 2022). It is a low-cost, non-clinical & easy to use tool designed for leisure (Ojha, 2022).

Students who exhibit impairments in social, language, and communication skills and tend toward repetitive patterns of interest and behaviors are often diagnosed with autism spectrum disorder (Ojha, 2022). AI techniques can facilitate early intervention & provide specialists with strong tools indicating the person's ASD level (Ojha, 2022). Sebe et al. (2006) applied an emotion recognition computerized tool based on joint visual and audio cues (Ojha, 2022). Besides the six universal emotions (happy, surprise, anger, disgust, fear & sadness), this human-computer interaction application can recognize other affective states like interest, boredom, confusion & frustration when it is difficult to assess emotion (Ojha, 2022). Riedl et al. (2007) have designed a platform to aid students with high functioning Autistic Spectrum disorder (HFASD) rehearse and learn social skills with reduced help from parents, teachers, and therapists (Ojha, 2022). AI apps are also helping people with Down Syndrome and Autism perform their tasks/jobs in manufacturing and distributing (Ojha, 2022).

Another tool used to assist students with special needs is the Fuzzy Cognitive map. The Fuzzy Cognitive map is an extension of cognitive maps which inherited the main aspects of fuzzy logic and Artificial Neural Networks for graphically representing the reasoning behind a given domain of interest (Fuzzy et al., 2022). Cognitive strategies may increase the efficiency and confidence with which the student approaches a learning task and the ability to develop a product, retain

essential information, or perform a skill. Fuzzy cognitive maps are a soft computing methodology that uses symbolic representation to describe and model complex systems for differential diagnosis of sensory and physical impairment from dyslexia and autism (Ojha, 2022). Fuzzy cognitive maps were proposed by Kosko (1986) as a graph-based knowledge representation method describing a set of concepts in a domain of interest that are connected by cause-and-effect relationships among them (Felix, G., et., al., 2019). Fuzzy cognitive maps (FCMs) are becoming popular within the scientific community (Felix, G., et., al., 2019). Despite considerable advances in the theory and applications of FCMs, there needs to be a current, comprehensive appearance of the state-of-the-art in this domain (Felix G. et al., 2019).

Schipor et al. 2003 attempted to create a computer-based speech therapy CBST system using a fuzzy expert system for helping learners with speech disorders called LOGOMON (Ojha, 2022). Pavlopoulos et al. (2008) implemented a neural network approach for the learners' self-assessment optimized with genetic aid. According to Saul et al. (2022), Fuzzy cognitive maps can be a great tool as they enable the exploration of the structure of the personal meaning systems of students, determine any obstacles, and simulate hypothetical scenarios that project its future evolution. Fuzzy cognitive maps can assist in identifying cognitive conflicts that hinder the adoption of health habits and establish more effective personalized intervention programs that make the maintenance of the habits easier. Fuzzy Cognitive maps may assist in laying out complex ideas, processes and recognizing patterns and relationships.

Along with the vast utilization of AI in the field of education, much less known are the possibilities and impacts on the physical and mental development of students with special needs (Lai et al., 2023). Prior research has been focused on theory to the exclusion of the psychological impact, emotion, and influencing factors of AI in education (AIED), with empirical research needing to be more extensive (Lai et al., 2023). The application of AI in education may be understood as integrating artificial intelligence technology into education sections (Lai et al., 2023).

There are currently five typical ways AI is applied in education: an intelligent education environment, intelligence learning process support, intelligence education evaluation, intelligent teacher assistance, and intelligent educational management and services (Lai et al., 2023). Research has shown three main forms of AI used in Guangzhou's Artificial Intelligence Curriculum Reform Experimental Schools (Lai et al., 2023). The first form is curriculum teaching, consisting of information technology courses, general technology courses, flat panel teaching, and intelligent reading (Lai et al., 2023). The second form of interest classes entails programming courses and assembling robots (Lai et al., 2023). The third form entails mass organization, such as 3D printing, Lego plug-ins, and teaching boxes (Lai et al., 2023).

According to Lai et al. (2023), Interpersonal relationships are important to social adaptability. A good interpersonal relationship benefits social adaptability (Lai et al., 2023). The theory of social presence and the theory of social content that cue decrease, based on cue sifting orientation, media communications is more likely than face-to-face communication to waken the ability and expectations of students to create social interaction due to the limited of important nonverbal and situational cues, particularly those cues involving vision, hearing and touch (Lai et al., 2023). Despite non-face-to-face online social contact producing less social pressure and lower social anxiety than real in-person social contact, most students with social anxiety escape from real social

contact after obtaining social support online, which disadvantages their social adaptability touch (Lai et al., 2023).

Studies have revealed that applying artificial intelligence technology is conducive to individual development (Lai et al., 2023). Among the different methods and practices implemented for interventions, using novel technologies, especially educational robotics, has proven to be a valuable tool (Syriopoulou-Delli et al.; E., 2021). Studies show that students who interact with robots display a higher degree of creativity, promoting the development of their social ability (Ali, S., et., al., 2020), and wearable machines may increase the expression ability of adolescents with a diagnosis of autism spectrum disorders (Xian, W., et., al., 2020). Syriopoulou-Delli & Gkiolnta (2021) conducted a study to define and examine the skills acquired through robotic interventions and explore how they are associated with successful inclusion. Syriopoulou-Delli & Gkiolnta (2021) focused on the areas of social, cognitive, and functional skills of students with disabilities and concluded that there is a need for the implementation of newly introduced practices.

However, some studies have shown that applying artificial intelligence technology disadvantages individual development (Xian, W., et., al., 2020). For example, intelligent electronic devices may harm adolescents' interpersonal relationships (Halpern & Katz, 2017). Furthermore, social adaptability (Jin & Zhang, 2017).and the elderly adults cared for by robot partners feel more lonely and emotionally indifferent (Thibault et al., 2019). Lai T. et al. (2018) conducted a study that revealed AIEd harms adolescents' social adaptability and is significantly negatively connected with social adaptability and family support. However, there was no significant correlation with school support (Lai T. et al., 2018). AI in education (AIEd) may not only affect social adaptability directly but also could affect it through family support (Lai, T., et., al., 2018).

Along with the vast utilization of AI in the field of education, must less known are the possibilities and impacts on the physical and mental development of students with special needs (Lai et al., 2023). Prior research has been focused on theory to the exclusion of the psychological impact, emotion, and influencing factors of AIEd, with empirical research needing to be more extensive (Lai et al., 2023). The application of AI in education may be understood as integrating artificial intelligence technology into education sections (Lai et al., 2023).

Artificial intelligence in education (AIEd) derives from computers and other media technologies, making it attached to intellectual devices such as the Internet and electronic equipment (Xian, W., et., al., 2020). Education is a social activity, and interaction and cooperation are central to teaching (Xian, W., et., al., 2020). However, AIEd makes machines the intermediary connecting students and teachers, changing the interpersonal relationship of teaching from human-human to human-machine-human (Xian, W., et., al., 2020). The altered space-time relationship of teaching reduces real teacher-student interpersonal interaction, and the student's sense of social presence is weakened (Xian, W., et., al., 2020). AIEd has a great situational difference from conventional teaching and lacks sufficient nonverbal clues, situational clues, and other important information, which disadvantages adolescents' social adaptability (Xian, W., et., al., 2020).

Like the Internet, texting, and social media, artificial intelligence is the latest technology, and parents are behind children in usage and knowledge (Parents lag behind children on AI use; however, both groups share concerns, 2023). In a recent poll by Common Sense Media, 58% of

students ages 12- 18 admit that they have used ChatGPT, compared to 30% of parents (Parents lag behind children on AI use, but both groups share concerns, 2023). Though 77% of parents are interested in AI-powered learning tools, only 40% were aware of reliable information sources to learn more about AI and how it could benefit students (Parents need to catch up on AI use, but both groups share concerns, 2023). The poll also revealed that 61% of parents and 51% of students believe that AI in classrooms should be limited until schools have rules and safeguards in place (Parents are behind children with AI use, but both groups share concerns, 2023). Overall, 77% of parents and 92% of students believe that generative AI technology has a high potential to enhance learning (Parents lag behind children on AI use, but both groups share concerns, 2023).

Parents and students are intrigued about the potential of AI in education (Klein, 2023). However, parents and students also see the potential for the extraordinary downside (Klein, 2023). The majority of both parents and students are concerned that students may become too dependent on AI (Klein, 2023). Roughly two-thirds of parents and students worry that students could rely too heavily on the tech for school assignments or use it to cheat (Klein, 2023). The majority of both parents and students believe schools should place rules governing how AI is used in the classroom (Klein, 2023). For instance, 78 percent of parents and 72 percent of students support not allowing ChatGPT to be used during tests (Klein, 2023). Moreover, 89 percent of parents and 85 percent of students favor putting clear school guidelines around ChatGPT before it can be used for assignments (Klein, 2023). However, for students with disabilities and special needs, using AI in the classrooms promotes inclusivity and enables students to achieve academic achievement.

Students with disabilities demonstrate delays in educational and occupation achievement in adulthood. Stigma compromises position and self-efficacy and can impact the life opportunities of students with special needs. Artificial intelligence is creating more opportunities for students with special needs to achieve academic success to the best of their abilities despite diverse disabilities.

AI tools in teaching and learning may enable the inclusion of students with learning impairments or disabilities (Ojha, 2022). AI effectively supports online learning and teaching, including personalized learning for students, automated instructions, routine tasks, and powering adaptive assessments (Ojha, 2022). Robotics with AI can be utilized to support, assist and augment teaching professionals (Ojha, 2022). Proper assistive technology enables students with disabilities to compensate for certain impairments (Ojha, 2022). Specialized technology promotes independence and decreases the need for other support. (Ojha, 2022).

AI can dramatically improve the efficiencies of our workplaces and can expand the work humans can do. (Ojha, 2022). AI assists teachers with detecting learning difficulties students are experiencing and addressing concerns early (Ojha, 2022). AI tools and inventories are an important part of education, especially for students with special needs (Ojha, 2022). AI can integrate the student's freedom of action with more explicit control and guidance (Ojha, 2022). Teachers and parents mostly use AI in training students rather than diagnosing their needs (Ojha, 2022). AI tools enable tracking each student's activities and progress/performance (Ojha, 2022). Student attendance can be updated, and face recognition may be used (Ojha, 2022). AI enables easier access to feedback from students, parents, and teachers (Ojha, 2022). AI can assist people in developing skills within the workplace and develop a culture around inclusive hiring and economic recovery (Ojha, 2022).

Analysis

Including students in special education in regular classrooms suggests that students with disabilities should not be discriminated against in getting education opportunities (ChalkyPapers,2023). One of the greatest challenges has been to arrive at the best way to deliver education to special needs students that provides a positive experience in education as well as helping with the social aspects that accompany education (ChalkyPapers,2023). One of the reasons for placing students with special needs into typical developing classroom settings is to kill the stigma associated with disability, despite the arguments that inclusion may create more stigmas (ChalkyPapers,2023). Stigma and inequality continue and contribute negatively to the learning of students with learning disabilities (The Effects of Stigma on Students with Learning Disabilities and Inclusive Classroom Practices,2023).

Many believe the best way to assist students with disabilities is to provide a separate space where specific needs can be met (The Effects of Stigma on Students with Learning Disabilities and Inclusive Classroom Practices,2023). However, stigma develops as attention is drawn from students not spending their whole day in the regular class for the special education teacher to assist them in overcoming their disabilities, which does not translate to the inability (ChalkyPapers,2023).

Many contend that inclusion, where students can spend their time fully in the regular class with typically developing students, would prevent stigmatization (ChalkyPapers,2023). Inclusive classrooms bring meaningful and accessible education for students with disabilities (The Effects of Stigma on Students with Learning Disabilities and Inclusive Classroom Practices,2023). Inclusive classrooms consist of significant accommodations that enable students to gain access to the general education curriculum (Leijen & Baucal, 2021).

Artificial Intelligence has greatly impacted various industries, and education is no exception (Greene, 2023). AI provides students with personalized learning experiences and teachers with powerful tools to track student progress and adapt teaching methods (Greene, 2023). AI has been praised for its potential to improve learning outcomes by providing students with more efficient and effective learning methods (Greene, 2023).

The possible benefits of AI in learning are significant, with the ability to revolutionize teaching and learning processes (Greene, 2023). Despite challenges, such as bias and limitations in individualized learning, the potential benefits make AI a promising tool for educators to consider (Greene, 2023). AI in learning has the potential to enhance the educational experience, improve learning outcomes, and support student success (Greene, 2023).

However, with the rise of AI in learning, there are concerns about its possible negative impact on students (Greene, 2023). Some experts argue that AI-based learning platforms could hinder critical thinking skills and reduce human interaction, an essential aspect of learning (Greene, 2023). Using AI in learning raises ethical concerns (Greene, 2023). Bias in algorithms used by AI may pose significant concerns, as incorrect programming may result in biased outcomes or promote certain ideologies without transparency (Greene, 2023). There is also concern that AI may replace human teachers as human interaction, guidance, and support are crucial for students' development

(Greene, 2023). Many concerns regarding data privacy and security issues have been raised, as the collection and use of student data must be ethical and transparent (Greene, 2023). Educators and policymakers must consider ethical considerations when implanting AI in learning (Greene, 2023).

Transparency and accountability ensure that AI benefits students and does not harm them (Greene, 2023). The ultimate goal should be to enhance the learning experience and improve learning outcomes rather than replacing human teachers or compromising student privacy and security (Greene, 2023).

AI is making great contributions to inclusive learning environments in education (Sharma, 2022). Children with special needs perform better with custom-made solutions than a one size fits all solution (Sharma, 2022). AI provides students with special needs more independence, minimizing the dependence on educators and increasing confidence to handle situations independently (Sharma, 2022). Speech recognition technology enables students with special needs to record the lessons or convert handwritten text to speech (Sharma, 2022). Augmentative communication and speech therapy classes are led online to help kids with speaking disabilities compete with other students in the classroom (Sharma, 2022). AI-based translators assist students in bridging the gap between two or more languages (Sharma, 2022). Students can learn in a language they understand (Sharma, 2022).

Students can depend on web-based learning and online classes to overcome geographical and distance barriers (Sharma, 2022). Through the removal of bias, individualized learning, accessibility, affordability, teaching techniques, virtual teaching assistants, adaptive learning management systems, and AI-powered test generation and evaluation tools, artificial intelligence is not only increasing inclusivity within classrooms but also becoming the core of education industry (Sharma, 2022).

In addition to personalization (Frąckiewicz, 2023), AI can also assist in identifying learning difficulties and disabilities (Frąckiewicz, 2023). AI-powered tools analyze data from many sources, such as student assessments and classroom observations, to identify patterns indicating a learning difficulty or disability (Frąckiewicz, 2023). By providing timely and accurate information, AI can help educators and parents take the necessary steps to support students with special needs (Frąckiewicz, 2023). Another promising application of AI in special education is the development of assistive technologies (Frąckiewicz, 2023). AI-powered devices and software can help students with disabilities overcome challenges and participate more fully in learning (Frąckiewicz, 2023). For example, AI-powered speech recognition software can assist students with speech impairments to communicate more efficiently. In contrast, AI-driven smart glasses can assist visually impaired students in navigating their environment (Frąckiewicz, 2023). These technologies not only improve the quality of life for students with disabilities but also enable them to engage more actively in their education (Frąckiewicz, 2023).

Summary

Special Education is specifically designed to meet the educational needs of students with special needs (Understanding the 13 Categories of Special Education, 2016). Special Education provides resources that will enable students with special needs to be successful in an educational setting.

Since the 1970s, through advocacy, students with special needs have gained more rights to free appropriate Education that had previously been nonexistent. The Individuals with Disabilities Education Act was enacted to ensure that students with special needs receive services within the least restrictive environment possible. The IDEA requires schools to provide an individual education plan and individualized transition plans to prepare students for adulthood (Morin, 2023).

Inclusive Education has come with controversy. The stigma surrounding including students with special needs in regular classrooms has caused debate among parents, teachers, and professionals. The two opposing notions consist of inclusion for some and inclusion for all. Some argue that students with special needs have a right to the highest quality of Education delivered by specially trained staff but need to be provided the opportunity to learn together in a regular classroom as those who support inclusion for all content (Leijen & Baucal, 2021). While research on the lived experiences of the stigma of students with special needs remains understudied, psychologists view irrationality as the main cause of inclusion phobia (American Psychiatric Association, 2013).

The emergence of Artificial Intelligence has provided more opportunities for inclusive classrooms in educational settings. Artificial Intelligence technologies create equality and personalized learning (Ojha, 2022). Interactive machine tutors provide more focused, personalized learning experiences (Koksal, 2018). AI's adaptivity focuses on specific problem areas and complements traditional teaching methods. AI also improves the accuracy of assessments to identify students with special needs (Lynch, 2023). AI improves the teachers' ability to identify learning difficulties students may be experiencing (Morrison, 2022). AI is the only way to scale customized instruction by providing instruction programs that can adapt independently in response to the needs of students and increase assignments in the trial as students move forward in the curriculum (Bacjer-Hicks, A. et al., 2017).

AI also offers a variety of technology that meets the individualized needs of students with special needs. AI technologies contain simulation-based collaborative learnings that promote better problem-solving reasoning in simulated scenarios (Mercier & Sperber, 2017). ActiveMath is a web-based intelligent tutoring system that assists students with developing their math skills (Ojha, 2022). The Intelligent Tutoring System (ITS) is used to help students find solutions for algebra equations that authentic problems to students and emphasize learning by doing (Ojha, 2022). A neuro-sky mindset, AI technology, is used to detect attention levels in an assessment exercise, an intervention tool for students with ADHD (Ojha, 2022). The Fuzzy Cognitive map and Artificial Neural Networks for graphically representing the reasoning behind a given domain of interest (Fuzzy et al., 2022). Cognitive strategies increase the ability to develop a product, retain essential information, or perform a skill (Fuzzy et al., 2022).

While the potential of AI in Education has garnered great excitement, parents, students, and teachers are cautious about potential ethical concerns (Klein, 2023). Besides the potential to become too dependent on technology for school assignments, there is also a fear that technology may be utilized to cheat on exams or assignments (Klein, 2023). Other ethical concerns are continuing systemic bias and discrimination, perpetuating unfairness for mostly disadvantaged and marginalized students, and amplifying racism, sexism, and other forms of injustice and inequality by integrating algorithms (Akgun & Greenhow, 2022). Most people favor putting clear regulations and security software on the technology used within educational settings.

About the Author

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Resources

- Agran, M., Brown, F., Hughs, C., Quirk, C., & Ryndak, D. (2014). *Equity and full participation for individuals with severe disabilities: A vision for the future*. Baltimore, MD: Paul H. Brookes
- Akgun, S., & Greenhow, C. (2021). Artificial intelligence in education: Addressing ethical challenges in K-12 settings. *AI and Ethics*, 2(3). <https://doi.org/10.1007/s43681-021-00096-7>
- Ali S., Park H. W., & Breazeal C. (2020). A social robot's influence on children's figural creativity during gameplay. *International Journal of Child-Computer Interaction*, 28(4): 100234. <https://doi.org/10.1016/j.ijcci.2020.100234>.
- Allport, G. W. (1935). "Attitudes." In *A Handbook of Social Psychology*, edited by C. A. Murchison, 798–844. Worcester, MA: Clark University Press.
- American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders*. 5th ed. Arlington, VA: American Psychiatric Publishing. [Crossref], [Google Scholar]
- Arkansas State University. (2016). The History of Special Education in the U.S. | A-State Online. A-State Online. <https://degree.astate.edu/articles/k-12-education/the-history-of-special-education-in-the-u-s.aspx>
- Avramidis, E., and B. Norwich. (2002). "Teachers' Attitudes Towards Integration/inclusion: A Review of the Literature." *European Journal of Special Needs Education* 17 (2): 129–147. doi:10.1080/08856250210129056.
- Bacher-Hicks, A., Chin, M. J., Kane, T. J., & Staiger, D. O. (2017). *An Evaluation of Bias in Three Measures of Teacher Quality: Value-Added, Classroom Observations, and Student Surveys*. National Bureau of Economic Research. <https://doi.org/10.3386/w23478>
- ChalkyPapers. (2023). *Mainstreaming and Inclusion of Students With Special Needs*. Retrieved from <https://chalkypapers.com/mainstreaming-and-inclusion-of-students-with-special-needs/>
- Chatzitheochari S, Platt L (2019) Disability differentials in educational attainment in England: Primary and secondary effects. *British Journal of Sociology* 70(2): 502–525.
- Chernikova, O., N. Heitzmann, M. Stadler, D. Holzberger, T. Seidel, F. Fischer Simulation-based learning in higher education: A meta-analysis
- Croll, P., and D. Moses. (2000). "Ideologies and Utopias: Education Professionals' Views of Inclusion." *European Journal of Special Needs Education* 15 (1): 1–12. doi: 10.1080/088562500361664 [Taylor & Francis Online], [Google Scholar]

- Csanadi, A., Kollar, I., Fischer, F. (2021). Pre-service teachers' evidence-based reasoning during pedagogical problem-solving: Better together? *European Journal of Psychology of Education*, 36 (1), pp. 147-168,
- Department for Education. (2001). Special educational needs (SEN) code of practice. GOV.UK. <https://www.gov.uk/government/publications/special-educational-needs-sen-code-of-practice>
- Dua, V., & Dua, A. (2017). Inclusive Education: Challenges and Barriers [Review of Inclusive Education: Challenges and Barriers]. *Paripex - Indian Journal of Research*, 6(1), 856–858. <https://doi.org/ISSN%20-%202250-1991>
- Ehala M. (2020). Tulevik on erikoolide päralt. [Future is for special schools]. *Postimees*. Available at: <https://leht.postimees.ee/6901395/tulevik-on-erikoolide-paralt>
- European Parliament. (2017). “Inclusive Education for Learners with Disabilities”. Accessed 23 May 2019. <http://www.europarl.europa.eu/supporting-analyses> [Google Scholar]
- Farrell M. (2010). *Debating Special Education*. London: Routledge. [Google Scholar]
- Felder F. (2019). Inclusive education, the dilemma of identity and the common good. *Theory Res. Educ.* 17, 213–228. doi: 10.1177/1477878519871429 21
- Felix, G., Nápoles, G., Falcon, R. et al. (2019). A review on methods and software for fuzzy cognitive maps. *Artif Intell Rev* 52, 1707–1737 <https://doi.org/10.1007/s10462-017-9575-1>
- Fourtané, S. (2021). Artificial Intelligence Plays Key Role in the Future of Higher Education. *Fierce Education*. <https://www.fierceeducation.com/best-practices/artificial-intelligence-critical-to-future-higher-education-0>
- Frąckiewicz, M. (2023). The Potential of AI in Special Education. *TS2 SPACE*. <https://ts2.space/en/the-potential-of-ai-in-special-education/>
- Friendship Circle / Resources. (2023). www.friendshipcircle.org. <https://www.friendshipcircle.org/blog/2011/01/17/the-stigma-of-special-education>
- Goodey, C. F. (2011). *Learning Disability and Inclusion Phobia: Past, Present, Future*. London: Routledge. [Google Scholar]
- Gray D (2002) ‘Everybody just freezes. Everybody is just embarrassed’: Felt and enacted stigma among parents of children with high functioning autism. *Sociology of Health & Illness* 24(6): 734–749.
- Greene, R. T. (2023). The Pros And Cons Of Using AI In Learning: Is ChatGPT Helping Or Hindering Learning Outcomes? *eLearning Industry*. <https://elearningindustry.com/pros-and-cons-of-using-ai-in-learning-chatgpt-helping-or-hindering-learning-outcomes>
- Halpern D., & Katz J. E. (2017). Texting’s consequences for romantic relationships: a cross-lagged analysis highlights its risks. *Computers in Human Behavior*, 71(11): 386–394. <http://dx.doi.org/10.1016/j.chb.2017.01.051>.
- How AI is Revolutionizing Special Education. (2023). [www.linkedin.com](https://www.linkedin.com/pulse/how-ai-revolutionizing-special-education-jamie-culican/). Retrieved August 6, 2023, from <https://www.linkedin.com/pulse/how-ai-revolutionizing-special-education-jamie-culican/>
- Indiana Teachers of Tomorrow. (2020). The Pros and Cons of Inclusion/Mainstreaming. <https://www.teachersoftomorrow.org/media-in/Inclusion-Pros-Cons.pdf>
- Jin M. G., Luo X. M., & Zhang G. H. (2020). The Development and Relationship between Freshmen’s Mobile Phone Dependence and Social Adaptation: A Cross Lagged Regression Analysis. *Psychology: Techniques and Application*, 5(8): 449–454.

- Kart, A., & Kart, M. (2021). Academic and Social Effects of Inclusion on Students without Disabilities: A Review of the Literature. *Education Sciences*, 11(1), 16. <https://doi.org/10.3390/educsci11010016>
- Kauffman J. M., Hornby G. (2020). Inclusive vision versus special education reality. *Educ. Sci.* 10:258. doi: 10.3390/educsci10090258 [CrossRef] [Google Scholar] [Ref list]
- Kiesewetter, J., I. Hege, M. Sailer, E. Bauer, C. Schulz, M. Platz, M. Adler., (2022), A usability study for implementing remote collaboration in a virtual patient platform *JMIR Medical Education* 10.2196/24306
- Klein, A. (2023). Students and Parents Are Bullish on AI's Potential for Education. *Education Week*. <https://www.edweek.org/technology/students-and-parents-are-bullish-on-ais-potential-for-education/2023/05>
- Klemm, K. 2015. "Inklusion in Deutschland [Inclusion in Germany]." Gütersloh: Bertelsmann Stiftung. Accessed 12 March 2019. http://www.bertelsmann-stiftung.de/fileadmin/files/BSt/Publikationen/GrauePublikationen/Studie_IB_Klemm_Studie_Inklusion_.pdf [Google Scholar]
- Koksal, I. (2018, April 19). *AI has already started Reshaping Special Education*. *Forbes*. <https://www.forbes.com/sites/ilkerkoksal/2018/04/17/ai-has-already-started-reshaping-the-special-education/?sh=622823d629d5>
- Lai, T., Xie, C., Ruan, M., Wang, Z., Lu, H., & Fu, S. (2023). Influence of artificial intelligence in education on adolescents' social adaptability: The mediatory role of social support. *PLOS ONE*, 18(3), e0283170. <https://doi.org/10.1371/journal.pone.0283170>
- Lazic, M. (2022). 27 Striking Special Education Statistics You Need to Know. *What to Become*. <https://whattobecome.com/blog/special-education-statistics/>
- Leijen, Ä., Arcidiacono, F., & Baucal, A. (2021). The Dilemma of Inclusive Education: Inclusion for Some or Inclusion for All. *Frontiers in Psychology*, 12(1). <https://doi.org/10.3389/fpsyg.2021.633066>
- Link, B. G., & Phelan, J. C. (2001). Conceptualizing Stigma. *Annual Review of Sociology*, 27, 363–385. <http://www.jstor.org/stable/2678626>
- Lynch, M. (2022a). How AI Is Changing Special Education. *The Tech Edvocate*. <https://www.thetechadvocate.org/how-ai-is-changing-special-education/>
- Lynch, M. (2022b). How Educators Use Artificial Intelligence to Add Instructional Value. *The Edvocate*. <https://www.theedadvocate.org/how-educators-use-artificial-intelligence-to-add-instruional-value/>
- Lynch, M. (2023). AI Has Already Started Reshaping Special Education. *The Edvocate*. <https://www.theedadvocate.org/ai-has-already-started-reshaping-special-education/>
- Morin, A. (2023). What is special education?. *Understood*. <https://www.understood.org/en/articles/understanding-special-education>
- Morrison, N. (2022.). AI Helps Teachers Spot Students With Learning Difficulties. *Forbes*. Retrieved August 5, 2023, from <https://www.forbes.com/sites/nickmorrison/2022/04/15/ai-helps-teachers-spot-students-with-learning-difficulties/?sh=e58edea4d3cf>
- Ojha, S. T. (2022). Artificial Intelligence In Special Education, Id& Cp [Review of Artificial Intelligence In Special Education, Id& Cp]. *Journal of Positive School Psychology*, 6(6), 8341–8345. [file:///C:/Users/chcd22/Downloads/JPSP+-+2022+-+657%20\(5\).pdf](file:///C:/Users/chcd22/Downloads/JPSP+-+2022+-+657%20(5).pdf)

- Qu, X. (2021). Structural barriers to inclusive education for children with special educational needs and disabilities in China. *Journal of Educational Change*, 23(2), 253–276. <https://doi.org/10.1007/s10833-021-09426-2>
- Parents lag behind children on AI use, but both groups share concerns. (2023). K-12 Dive. Retrieved August 5, 2023, from <https://www.k12dive.com/news/parents-children-ChatGPT-ai-use/650869/>
- Paseka, A., & Schwab, S. (2019). Parents' attitudes towards inclusive education and their perceptions of inclusive teaching practices and resources. *European Journal of Special Needs Education*, 35(2), 254–272. <https://doi.org/10.1080/08856257.2019.1665232>
- Poznanski, B., K.C. Hart, P.A. Graziano. (2021). What do preschool teachers know about attention-deficit/hyperactivity disorder (ADHD) and does it impact ratings of child impairment? *School Mental Health*, 13 (1), pp. 114-128, 10.1007/s12310-020-09395-6
- Reinke, W.B., M. Stormont, K.C. Herman, R. Puri, N. Goel (2021). Supporting children's mental health in schools: Teacher perceptions of needs, roles, and barriers - an overview | ScienceDirect Topics. [www.sciencedirect.com](https://www.sciencedirect.com/topics/engineering/fuzzy-cognitive-map). Retrieved August 4, 2023, from <https://www.sciencedirect.com/topics/engineering/fuzzy-cognitive-map>
- Review of Educational Research, (2020), 90 (4) pp. 499-541, 10.3102/0034654320933544
- Robinson, D., & Goodey, C. (2017). Agency in the darkness: “fear of the unknown”, learning disability and teacher education for inclusion. *International Journal of Inclusive Education*, 22(4), 426–440. <https://doi.org/10.1080/13603116.2017.1370738>
- Rossa, Carina. (2017). The History of Special Education. *Journal for Perspectives of Economic Political and Social Integration*. 23. 209-227. 10.1515/pepsi-2017-0011.
- Sailer, M., Bauer, E., Hofmann, R., Kiesewetter, J., Glas, J., Gurevych, I., & Fischer, F. (2022). Adaptive feedback from artificial neural networks facilitates pre-service teachers' diagnostic reasoning in simulation-based learning. *Learning and Instruction*, 101620. <https://doi.org/10.1016/j.learninstruc.2022.101620>
- Samuels, C. A. (2019). Special Education Is Broken. *Education Week*. <https://www.edweek.org/teaching-learning/special-education-is-broken/2019/01>
- Saúl LA, Sanfeliciano A, Botella L, Perea R, Gonzalez-Puerto JA. (2022). Fuzzy Cognitive Maps as a Tool for Identifying Cognitive Conflicts That Hinder the Adoption of Healthy Habits. *Int J Environ Res Public Health*. 2022 Jan 27;19(3):1411. doi: 10.3390/ijerph19031411. PMID: 35162434; PMCID: PMC8835037.
- Schwab, S. (2019). “Inclusive and Special Education in Europe.” *Oxford Research Encyclopedia of Education*. Accessed 13 June 2019. <https://oxfordre.com/education/view/10.1093/acrefore/9780190264093.001.0001/acrefore-9780190264093-e-1230>
- Sharma, A. (2022). AI in Inclusive Learning: Can Technology Make It A Reality? <https://www.datatobiz.com/blog/ai-in-inclusive-learning/>
- Special Education (IDEA) - A Short History. (2023). Parents Inc. <https://parentsinc.org/spedhist.html>
- Spencer, Nick, Blackburn, Clare and Read, Janet. (2015) Disabling chronic conditions in childhood and socioeconomic disadvantage: a systematic review and meta-analyses of observational studies. *BMJ Open*, 5 (9). e007062. <http://dx.doi.org/10.1136/bmjopen-2014-007062>

- Staff, A. E. S. (2023). A short history of special education: All education schools. AllEducationSchools.com. <https://www.alleducationschools.com/blog/history-of-special-education/>
- StaOjha, S. T. (2022). Artificial Intelligence In Special Education, Id& Cp [Review of Artificial Intelligence In Special Education, Id& Cp]. *Journal of Positive School Psychology*, 6(6), 8341–8345. file:///C:/Users/chcd22/Downloads/JPSP++2022++657%20(5).pdf
- Syriopoulou-Delli, Christine & Gkiolnta, Eleni. (2021). Robotics and inclusion of students with disabilities in special education. *Research Society and Development*. 10. 10.33448/rsd-v10i9.18238.
- The Effects of Stigma on Students with Learning Disabilities and Inclusive Classroom Practices. (2023). *Community Psychology: Social Justice through Collaborative Research and Action*. <https://www.communitypsychology.com/effects-of-stigma-on-students-with-learning-disabilities/>
- The History of Special Education in the United States | SpecialEdNews. (n.d.). <https://specialednews.com/the-history-of-special-education-in-the-united-states/>
- Thibault D. S., Omar B., & Paul E.(2019). Artificial intelligence, ethics and human values: the cases of military drones and companion robots. *Artificial Life and Robotics*. 2019, (24): 291–296. <https://doi.org/10.1007/s10015-019-00525-1>.
- Tjernberg, C., and E. H. Mattson. (2014). “Inclusion in Practice: A Matter of School-culture.” *European Journal of Special Needs Education* 29 (2): 247–256. doi:10.1080/08856257.2014.891336.
- Understanding the 13 Categories of Special Education. (2016). [Understandingspecialeducation.com](https://www.understandingspecialeducation.com). <https://www.understandingspecialeducation.com/13-categories-of-special-education.html>
- US Department of Education, Office of Special Education and Rehabilitative Services, (2010). *Thirty-Five Years of Progress in Educating Children with Disabilities Through IDEA*; Office of Special Education and Rehabilitative Services: Washington, DC, USA.
- Xiao W., Li M., Chen M., (2022). Deep interaction: wearable robot-assisted emotion communication for enhancing perception and expression ability of children with autism spectrum disorders. *Future Generation Computer Systems*. 2020, 108, 709–716. <https://doi.org/10.1016/j.future.2020.03.022>.