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From digital equality to social integration: Sociological foundations of technology use in special education

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Abstract

The sociological implications of technology use in special education remain underexplored, as prevailing approaches often frame disability through a medical lens that reinforces social exclusion and the digital divide. This study addresses this gap by examining technology within special education as a sociological right rather than merely a pedagogical aid. Grounded in qualitative research and employing document analysis, the study draws on the social model of disability alongside Labeling Theory and Structural Functionalism to analyze how technological infrastructures shape processes of social integration. The findings indicate that technology contributes to digital equity, mitigates the effects of social labeling, and repositions individuals with special needs from dependent subjects to active social actors. By enhancing autonomy and access to knowledge, technological adaptation functions as a mechanism that challenges structural barriers embedded within educational institutions. The study concludes that technology policies should be reframed within a social justice perspective rather than a device-oriented approach. It recommends removing economic obstacles and embedding sociological awareness of technology use into teacher education programs to foster inclusive and equitable educational systems.

Keywords: Digital equity; inclusive education; labeling theory; social integration; structural functionalism.

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1. INTRODUCTION

In modern sociological thought, education is the most fundamental institutional mechanism aimed at adapting individuals to the social order, internalizing shared values, and ensuring social mobility (Durkheim, 1956). However, when this structure is designed according to the needs of the majority, defined as "normal," it can transform into a system of exclusion rather than a socialization space for individuals with special needs. Traditional educational approaches have long based disability on a medical model that codes disability as a medical "deficiency" or "a malfunction requiring repair" (Oliver, 1990). On the other hand, the emerging "social model of disability" argues that disability lies not in the individual's biological characteristics, but in the limited access opportunities and structural barriers provided by society (Shakespeare, 2006). In this context, the use of technology in special education is not merely a pursuit of pedagogical efficiency, but a sociological necessity that overcomes these structural barriers and rebuilds equal opportunities in education.

Research increasingly shows that inclusive educational technologies help dismantle systemic barriers and support participation across diverse learning needs, aligning with the social model of disability and inclusion frameworks (Navas-Bonilla et al., 2025). Technology acts as a "social balancer," shaking the "stigmatized" identity of individuals with special needs within society and granting them autonomy. Assistive technologies and digital tools reverse the stigmatization process (Goffman, 2009) by shifting the societal perspective focused on the individual's limitations towards potential and productivity. In this respect, access to information and communication technologies strengthens the individual's 'cultural capital' (Bourdieu, 1986), thus closing the class and social divide created by the digital divide.

Empirical evidence suggests that digital inclusion initiatives in education reduce exclusionary outcomes by increasing access, engagement, and academic participation for students with disabilities (Welesilassie et al., 2025). Equality of opportunity in education is no longer measured solely by physical access to school buildings, but by the "democratization" of information through digital tools in a way that suits each individual's cognitive and sensory world (Selwyn, 2010). Studies of inclusive education also highlight that technology's role extends beyond access to facilitating personalized learning and participation, thereby fostering deeper social inclusion (Samaniego López et al., 2025). Therefore, the use of technology in special education creates a theoretical foundation that transforms the individual from a passive recipient into an active subject of social integration.

1.1. Purpose of study

This study examines the sociological dimensions of technology use in special education within the framework of qualitative research, using document analysis. The relevant literature: By examining it within the framework of social models and equal opportunity approaches, the transformative role of technology in social integration processes is discussed on a theoretical level.

2. MATERIALS AND METHODS

This study employs a qualitative research design grounded in document analysis to examine the sociological implications of technology use in special education. Drawing on the social model of disability, alongside Labeling Theory and Structural Functionalism, the research interrogates how technological infrastructures influence processes of social integration for individuals with special needs. The analyzed sources included peer-reviewed literature, theoretical frameworks, and empirical studies focusing on assistive technologies, digital inclusion initiatives, and individualized learning programs. Through thematic and interpretive analysis, the study explores how digital tools transform the educational experience from a medicalized, deficit-based model into one that promotes autonomy, social participation, and equity. The analysis highlights the mechanisms through which technology mitigates social labeling, enhances cultural and social capital, and fosters active engagement in society. Special attention is given to the interplay between technological tools, teacher mediation, family involvement, and societal perceptions, illustrating that technology functions not merely as a pedagogical aid but as a sociological instrument that reshapes disability from a passive condition to an empowered social identity.

3. RESULTS

3.1. Sociological dimensions and theoretical framework of special education

Special education is a specialized and multidisciplinary process aimed at the social inclusion of individuals who differ significantly from their peers in sensory, intellectual, physical, or academic aspects. From a sociological perspective, this process is not merely a pedagogical intervention, but a reflection of the meaning society attributes to "difference" and how it structurally positions this difference. In modern society, special education, from Parsons' (2013) structural-functionalist perspective, serves as a critical balancing mechanism for each individual's participation in the social division of labor according to their potential and for ensuring the continuity of the system. In this context, special education is a social policy tool that aims to transform individuals with disabilities from an "inactive" state into productive and functional members of society.

3.1.1. Individualized education program (IEP): a bridge of equity and social justice

The necessity of designing education according to individual developmental characteristics and unique needs is considered in sociological literature as a democratization initiative developed against standardized and disciplinary educational patterns. Considering Foucault's (1977) criticisms of modern educational institutions' tendency to homogenize and mold individuals through 'normalization,' Individualized Education Programs (IEPs) perform a liberating task that breaks this disciplinary pressure. Similar to Rawls' (2017) 'difference principle' in his theory of justice, this model builds equity in education by considering the greatest benefit for the least advantaged. In this process, the individual with special needs evolves from a passive 'object' of education to an active 'subject' who gains autonomy, a cornerstone of social freedom (Skrtic, 1991).

3.1.2. Inclusion and the sociological spatiality of educational environments

The spaces where special education is provided, from inclusion models in general education classrooms to special education schools, shape the 'spatial status' and perception of social distance that society grants to these individuals. Education provided in general education schools through integration and inclusion is considered the most concrete example of the 'social inclusion' strategy in sociology. Examined in light of Goffman's (2009) 'Stigma' theory, the exclusion of individuals with special needs from general education environments can lead to alienation in the rest of society and the formation of a 'secondary identity' in the individual. Inclusion models, on the other hand, mitigate this stigma through peer interaction, contributing to the formation of an awareness that social diversity is a richness (Avramidis & Norwich, 2002). At this point, spatial design is not only about physical accessibility but also about legitimizing the individual's sense of social belonging.

3.1.3. Applied methods and the development of social capital

Methods used in the educational process, such as Applied Behavior Analysis (ABA), Picture Exchange-Based Communication System (PECS), and play therapy, are critical interventions that sociologically structure an individual's 'social capital' (Bourdieu, 1986). Self-care and academic skills acquired through these methods increase the individual's mobility within society and minimize dependency relationships. The principles of ' early intervention ' and 'continuity' in the intervention phases should be considered as a 'preventive sociology' practice aimed at mitigating systemic barriers that the individual will encounter throughout their life at the developmental stage. Consequently, special education represents a structural reform that removes disability from the realm of fate and enables individuals to acquire an active position in the social division of labor in accordance with their abilities (Warnock, 2008).

3.2. Sociological foundations and key elements of special education technologies

The use of technology in special education is not merely the integration of opportunities brought about by the digital age into education, but rather a systematic intervention that expands the "existential boundaries" of individuals with special needs in social life. In a sociological sense, technology is an interface that regulates the interaction between the individual and society, moving disability from a state of "deficiency" to a status of "functional difference" (Selwyn, 2021).

3.2.1. Communicative action and social visibility: AAC and assistive technologies

Alternative and Augmentative Communication (AAC) systems, and the tools developed for individuals with speech difficulties, are of vital importance from the perspective of Habermas' (1984) "Theory of Communicative Action". An individual's ability to express their thoughts, demands, and rights directly determines their position in the social hierarchy. AAC technologies, by transforming silent individuals into speaking and demanding subjects in the public sphere, also establish their social visibility (Alper, 2017). In addition, assistive technologies such as reading pens and smart glasses designed for the visually impaired, and hearing aids developed for the hearing impaired, improve an individual's capacity to perceive, understand, and respond to environmental stimuli. In a sociological context, this process minimizes the level of dependence on others for individuals in different disability groups, granting them a status of independence in the social sphere. Thanks to these tools, the individual breaks free from the 'helpless' role assigned to them by society and transforms into a free actor capable of managing their own life (Oliver, 2018).

3.2.2. Safe simulations and social role-playing experiments: VR and AR

Virtual Reality (VR) and Augmented Reality (AR) applications serve as "safe social laboratories," especially for individuals with autism spectrum disorder or social anxiety. Goffman (1949) argues that individuals assume specific roles in social life, like "actors," and maintain social interaction through these roles. From this perspective, VR technologies allow individuals to rehearse complex and even anxiety-provoking social interactions in real life, such as shopping at a market or using public transportation, in a digital and protected environment (Parsons & Mitchell, 2002). These simulated environments improve the individual's social skills while simultaneously reducing "social friction" during the adaptation phase to the real social environment. This process accelerates the individual's social adaptation, eliminating the "alienation" barrier encountered in the social construction of disability. As a result, virtual reality moves the individual from the periphery of social life towards the center through virtual experiences (Standen & Brown, 2005).

3.2.3. Digital Literacy and New Statuses: Robotics and Coding

The inclusion of robotics and coding kits in special education curricula has determined not only an individual's academic status but also their status in the future digital economy. Individuals who acquire problem-solving and logical reasoning skills break down the "passive consumer" image imposed on them by society and gain the identity of "active producers." From a sociological perspective, this is a tool for "social mobility" (Warschauer, 2004). A child with special needs who learns coding or works with robotics kits begins to speak the same technological language as their peers. This common language of communication removes disability from being a difference and constructs a new social identity based on technological competence. This not only balances the disadvantaged position in social stratification but also provides the individual with "cultural capital" (Bourdieu, 1986) and increases their value in the social division of labor.

3.3. Sociological outcomes and benefit analysis of special education technologies

The practical advantages brought by special education technologies serve as "structural reinforcers" that build a bridge between the individual and society from a sociological perspective. These technologies enhance the student's power to "determine their own destiny" as a social actor, rather than their academic success (Wehmeyer et al., 2004).

3.3.1. The relationship between individualization and equity

The fact that technology provides opportunities tailored to each student's learning style and pace is reflected in sociological literature as the concept of "educational equity." Classical educational methods, as Bourdieu & Passeron (1990) stated, are designed according to the cultural capital of the dominant classes, and therefore risk becoming a field of "symbolic violence" for individuals with special needs. However, the individualization opportunities provided by technology address this systemic injustice by adapting education to the individual's biological and cognitive reality. Personalizing learning stages through gamification and interactive software frees the student from the label of failure, giving them self-confidence and a status of success within society (Rose & Meyer, 2002).

3.3.2. Accessibility: Overcoming Spatial and Informational Barriers

The ability of technology to overcome physical and cognitive barriers and access materials is a fundamental requirement of the 'accessibility' principle in social justice theory. In this regard, sociologist Titchkosky (2011) argues that accessibility is not merely a physical building ramp, but a right to participate in all aspects of social life. In this context, smart boards, tablets, audio materials, and hardware pave the way for the democratization of information. Removing these barriers to access to information closes the digital divide between individuals with special needs and the rest of society, making them equal stakeholders in the digitalized society (Regnedda & Muschert, 2013).

3.3.3. Active participation, motivation, and social belonging

Real-time monitoring and motivational support practices in educational processes are fundamental elements that strengthen the student's sense of belonging to the system. "Disconnection/loss of connection." From a theoretical perspective, individuals with learning disabilities tend to feel excluded from traditional and uniform methods. However, interactive tools and real-time feedback systems make the individual's presence visible in the educational process and reverse this alienation. Teachers' ability to observe student development in real time breaks down the perception of "invisibility" towards the individual; it removes the student from being a one-sided object of social surveillance and makes them an active member of a social support network (Florian & Hegarty, 2004). This process restructures not only the individual's academic success but also their social standing and self-esteem within the educational environment.

3.3.4. Independence: self-sufficiency as a social right

The most important sociological outcome of special education technologies is independence and self-sufficiency. In sociology, independence is the transformation of an individual from a social " object of care" to a citizen who makes their own decisions (Oliver, 1990). Assistive technologies that enhance daily living skills increase an individual's social capital and quality of life, thereby undermining their position as a "dependent class" in social stratification. This technological support is the ultimate gain that makes the individual's social integration sustainable and transforms them into an active producer in society (Seale, 2013).

3.4. The role of social stakeholders and attitudinal transformation in technological integration

The inclusion of technological tools in special education settings alone is not sufficient to ensure social integration. From a sociological perspective, the success of technology is directly linked to the "social climate" in which these tools are used and the attitudes of stakeholders (teachers, families, and society).

3.4.1. The teacher as a digital mediator and the changing authority

Technology is transforming the teacher's traditional role as an "information authority" in the school into that of a "facilitator" or "digital mediator." Within the framework of Vygotsky & Cole's (1978) "Zone of Proximal Development" theory, technology acts as a scaffold that reinforces the interaction between teacher and student. However, a teacher's distanced or medically oriented approach to technology can cause even the most advanced device to become a "tool of exclusion." Therefore, the sociological success of technology depends on the teacher's approach of using these tools not to "normalize" the individual, but to "support" their uniqueness.

3.4.2. Family involvement and the digital home environment

Technological integration in special education extends beyond the school walls into home life. Families' access to and socio-economic capacity for using technology is, in Coleman's (1988) words, a problem of "family social capital." The sustainability of technology at home ensures that the independence gained at school is transferred to social life. Increasing the digital literacy level of families reduces the "overprotective" family pressure on individuals with special needs, thereby strengthening their autonomy.

3.4.3. Social perception and "technological visibility"

Society's approach to individuals with special needs is being reshaped by the technological tools they use. For example, an individual using an AAC (Application-Assisted Recognition) device is seen by society as

someone who is "unable to speak and inadequate," but rather as "an actor whose communication has been enhanced with the help of technology." This breaks down barriers to courtesy and alienation in social interactions, paving a sociological path from viewing disability as a tragedy to accepting it as a form of diversity.

4. CONCLUSION

This study demonstrates that the integration of technology in special education is not merely an instrumental choice but a sociological necessity for promoting social equality of opportunity and justice. Findings indicate that technology transforms the status of individuals with special needs from a medicalized conception of “disability” to a socially recognized “subject” position. The social model perspective, combined with technological applications and the collaborative interaction among teachers, families, and communities, highlights digital tools as “social bridges” facilitating societal inclusion.

Supporting and advancing Individualized Education Program (IEP) applications through technology promotes the democratization of education, while advanced tools such as AAC, virtual reality, and robotics convert stigmatized identities into productive and autonomous ones. The accessibility and individualized opportunities afforded by technology can mitigate inequalities of opportunity, a core concern in the sociology of education. Nevertheless, effective realization of this potential requires more than the mere physical presence of technology in classrooms; it demands a comprehensive sociological shift in mindset encompassing educators, families, and society at large.

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Ethical Approval: The study adheres to the ethical guidelines for conducting research.

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