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Integration of ICT in Classrooms: Insights of Special Education Teachers

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Abstract

This study aimed to explore special education teachers' perceptions of ICT and its classroom applications, employing a qualitative descriptive research design. The research was conducted among special education teachers in Jordan's Ajloun District, with 10 participants. Data was gathered through semi-structured interviews and analyzed using thematic analysis. The findings underscore significant limitations stemming from inadequate infrastructure and a lack of suitable educational resources, hampering teachers' adoption of technology for instructional purposes. Teachers, however, recognize the potential of technology to enhance student learning and increase job satisfaction, though their willingness to acquire new technological skills for teaching depends on its necessity. Notably, there is substantial untapped potential for leveraging technology to create special education materials. Beyond developing resources for students using technologies such as body movement detection, touch screens, and smart toys, it is vital to provide teachers with training on integrating these tools into their classrooms and guide parents on supporting their children's learning at home. These resources can prove invaluable in teaching social skills, cognitive concepts, and self-care techniques, offering students ample opportunities for practice and feedback in real-world contexts, thereby enabling them to apply their knowledge and skills in diverse situations.

Keywords: *Special Education, Teachers, ICT, Developmental Areas.*

Introduction

In today's educational landscape, the incorporation of Information and Communication Technology (ICT) in pedagogical practices is playing a pivotal role in fostering a dynamic and inclusive learning experience (Katsarou, 2020). Classrooms in the twenty-first century are progressively adopting innovative technologies with the aim of enriching the learning journey for students across diverse abilities. These advancements hold great promise in promoting creativity, active participation, and enhanced learning outcomes for all students (Maida, 2015). The utilization of ICT in teaching and learning is more emphasized among mainstream students. However, prior studies highlight the numerous advantages of technology in education, such as its capacity to enhance student motivation and achievement (Karunamoorthy et al., 2020; Campigotto et al., 2013). Therefore, there is a general consensus that emerging technologies play a crucial role in assisting students with special needs in overcoming challenges and addressing their weaknesses and limitations (Drigas, 2013). These technologies not only facilitate access to knowledge but also help combat isolation by enabling communication and fostering interaction with the surrounding environment. By providing opportunities for engagement, new technologies have the potential to bridge gaps and reintegrate individuals with special needs into social contexts.

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Special Education is a specialized form of education provided to students with diverse learning needs who face challenges attending regular mainstream schools. These students may have various learning disabilities, such as physical disabilities or behavioral issues, which necessitate tailored teaching and learning approaches (Florian & Hegarty, 2004) and students with exceptional needs possess an equal right to receive an education of the same quality and standard as their peers without special needs (Karunamoorthy et al., 2020). Inclusive education principles advocate for providing all students with the necessary support and accommodations to achieve their full potential, irrespective of their abilities or disabilities. This approach ensures that every student is valued, respected, and given an equitable opportunity to learn and thrive together in a supportive educational environment.

The educational needs of individuals with disabilities exhibit significant diversity (Parbin, 2022). As on one hand, they must acquire the knowledge and skills necessary for their inclusion in society, similar to their peers. On the other hand, they face additional challenges, commonly known as special educational requirements, which arise due to functional limitations that hinder their access to conventional instructional methods. As a result, these constraints impede their educational progress. It is, therefore, imperative to acknowledge the importance of providing students with special needs equal opportunities for a high-quality education comparable to their peers in mainstream settings (Karunamoorthy et al., 2020).

Viewed through the lens of special education, the utilization of ICT among individuals with Special Needs (SN) becomes intriguing. Special education teachers play a vital role in creating, assessing, and actively participating in intervention strategies aimed at addressing and overcoming challenges in diverse learning environments. Their efforts focus on removing obstacles and ensuring inclusivity for students with special needs (Margalit, 2011). In the domain of ICT tailored for students with special needs, special education teachers hold diverse responsibilities. To achieve the mentioned objective, it is imperative to consider teachers' viewpoints on ICT usage for students with special needs and address the inclusion matter. This approach aims to provide support to teaching staff working with and catering to such students on a daily basis (Anderson, & Putman, 2020). In the rapidly evolving world, educators face significant challenges due to the swift advancements in ICT and the introduction of new curricula. Indeed, customizing instruction to cater to the diverse needs of students is a challenging undertaking, and incorporating assistive technology in teaching adds further responsibilities for educators. In an inclusive school setting, the teaching staff plays a pivotal role in adhering to the curriculum while effectively adapting their lessons to address students' individual needs. This entails being well-versed in new technologies, seamlessly integrating them with pedagogy and content, and staying informed about the latest advancements. Such efforts are vital in creating an inclusive and supportive learning environment that caters to the unique requirements of all students (Abed, 2018).

A substantial amount of research has been conducted in the area of ICT for learners with special needs in general educational settings, with a particular focus on using ICT to assist students with writing or reading difficulties. However, when it comes to exploring the perspectives of teaching staff working with special needs learners in mainstream educational environments and the implementation of ICT, there is a scarcity of documented studies. Very few scientific papers were found pertaining to this specific area of investigation. Considering the increasing investments in new technology in Jordanian educational settings, there is a need for further research to bridge this gap and gain more insights into the effective integration of ICT for learners with special needs in mainstream classrooms (Ahmed, Qasem, & Pawar, 2020).

ICT has the potential to enhance comprehension in students with special needs and improve teaching and learning practices (Maruf & Anjely, 2020). However, its utilization in the field of special education is currently limited. In the realm of educational technology, numerous studies have delved into the perspectives of teachers with regard to integrating Information and Communication Technology (ICT) into mainstream classrooms. However, a noticeable research gap exists concerning the viewpoints of

special education teachers, particularly in the context of Jordan, and specifically within Ajloun District. Recognizing this void, the present study was undertaken with the aim of shedding light on the opinions and experiences of special education teachers regarding the utilization of ICT in elementary school classrooms catering to children with special needs (Rababah, 2019). By focusing on this specific demographic within the Jordanian educational landscape, the research seeks to contribute novel insights into the challenges, benefits, and unique considerations that arise when integrating technology into special education settings. The findings from this study have the potential to inform educational practices, policies, and professional development initiatives tailored to the specific needs of special education teachers and the diverse students they serve in Jordan's Ajloun District.

Top of Form

Thus, this study tried to achieve the following objectives:

1. To explore elementary school teachers' perspectives in Ajloun district regarding integration of ICT tool in classrooms having children with special needs.
2. To find out the level of preparedness towards use of ICT tool of elementary school teachers in Ajloun district in classrooms having children with special needs.

Literature Review

As per the Child Care Law Centre, a child with special needs is defined as an individual who necessitates specialized care due to reasons related to their physical, mental, emotional, or health condition. Because each child possesses unique characteristics and distinct requirements, it's essential to recognize that a one-size-fits-all approach to caring for children with special needs is not suitable, even when children share the same disability or special need. "Children with special needs" can refer to youngsters who may have a slower pace of learning or face challenges related to mental health, including those with cognitive disabilities. These children may exhibit below-average academic abilities. Additionally, this term can encompass children dealing with various physical, mental, intellectual, or emotional disorders that necessitate tailored educational support (Siahaan, 2022). The phrase "Child with Special Needs" (CWSN) refers to a broad range of physical and mental disorders that may affect a child's growth and educational requirements. Physical limitations, sensory impairments, emotional or behavioral difficulties, and developmental delays are a few examples of these conditions. Understanding that each child's special needs are different and that meeting those requirements successfully is critical for their development and learning is essential.

To identify and meet the unique educational needs of kids with various learning disabilities, the term "Special Education Needs" (SEN) was first used formally in 1981. These problems can be caused by a number of things, such as sensory or physical limitations that hinder a child's capacity to sense and communicate with the environment, sentimental or behavioral problems that may have an influence on their behavior and interactions with others, and delays in development that may hinder their progress in learning important skills and knowledge (Weijers, 2000). In order to give every child, the tools and resources they need to access a fulfilling and inclusive education, SEN comprises a wide range of support and interventions that are tailored to each child's unique circumstances. Understanding and meeting the individual requirements of each child with special needs is crucial. This includes taking into account their special talents and growth potential and making sure they have the support they need to succeed academically and socially (Fred, 1986; Fredrickson et al, 2004).

ICT is viewed as a tool for bridging the divide between various groups of individuals, including those with special educational needs. ICTs and other assistive technology, in general, allow persons with special

educational needs to have more fulfilling lives, according to a growing body of research (Williams et al., 2006). In recent decades, the remarkable advancement of Information and Communication Technologies (ICTs) has brought about transformative changes in our world and the methods by which education is delivered. It is safe to assert that the utilization of ICTs influences virtually every facet of our daily lives. The influence of ICTs on education can be traced back to the 1970s when governments in various countries began recognizing the necessity of integrating technology to enhance the relevance and quality of educational experiences (Stevens, 2004). ICT is crucial to the education of students with special needs as well in order to give them a high-quality education. ICT was used in special education to guarantee that the teaching and learning process ran smoothly, to address the requirements of students with different abilities, and to increase student engagement. Language, physical, behavioral, social, emotional, and other areas are all positively impacted by the use of ICT in the teaching and learning of special needs kids. Each student's usage of ICT in special education is unique. The sort of ICT used in the classroom is determined by the demands of the students. ICT for special needs kids places a greater emphasis on applications (Karunamoorthy, et al., 2020).

ICT and assistive technology, according to numerous academics (Parbin, 2022; Cagiltay, et al., 2019; Balmeo, et al., 2014; Fakrudeen, et al., 2013), improve the quality of instructions for students with special needs and also are helpful for the teachers who are teaching such students in delivering the instructions. Utilizing cutting-edge technology within the realm of special education holds significant potential for enhancing teaching and learning experiences. Modern advancements, including interactive computer interfaces, fast processors, high-quality animated visuals, and online communication tools, have the capacity to create improved educational settings for children, educators, and parents (Cagiltay, et al., 2019). Numerous scholars have emphasized the advantages of integrating Information and Communication Technology (ICT) into special education settings. Florian (2004) outlined six key applications of ICT in this context. Firstly, ICT can support tutor programs, which involve personalized computer-based learning experiences. Secondly, technology enables the creation of exploratory learning environments, empowering students to engage with materials and exercise more control over their learning. The internet, for instance, offers an ICT avenue for such exploration. Thirdly, this aspect involves developing proficiency in using technology tools like word-processing software, skills transferable to non-educational settings such as home environments. Fourthly, ICT provides various assistive technology devices, like voice synthesizers, to assist students in communicating effectively. Fifthly, computer-based assessment systems extend beyond data recording and summarization. Singleton (2004), as cited in Florian (2004), highlighted advantages such as time and cost savings, enhanced test motivation, and improved precision and standardization. Lastly, educators working with students with special educational needs (SEN) must create individualized education plans tailored to address specific learning challenges. ICT tools, including the internet, are increasingly valuable for SEN professionals in managing these plans efficiently.

Certainly, the utilization of Information and Communication Technology (ICT) has the potential to improve the comprehension of students with special needs, enhancing the effectiveness of teaching and learning. However, it's noteworthy that ICT remains somewhat underemphasized within the realm of special education. While there exists an abundance of research on teachers' perspectives regarding ICT implementation in general classroom settings, the exploration of special education teachers' perceptions concerning ICT use in primary school classrooms has received limited attention and lacks emphasis. Consequently, in an effort to contribute new insights to the realm of research, a study was undertaken by researchers to assess the viewpoints of special education teachers regarding the integration of ICT in their classrooms. However, many teachers face a significant hurdle when it comes to integrating technology into their teaching practices – their lack of personal experience with these tools. To effectively incorporate technology-based activities and projects into their curriculum, teachers must first dedicate time to

familiarize themselves with these tools and grasp the associated terminology (Starr, 2011). When employed correctly, these technologies can serve as valuable resources not only for teachers but also for students, offering them opportunities to engage with new technologies. In the realm of special education, it becomes crucial for teachers to comprehend how technology can enhance the learning experience for students. Technology enables teachers to tap into each student's unique learning style while providing a platform for personalized, self-paced learning. It empowers educators to optimize instructional time by offering activities, project-based learning, one-on-one guidance, and peer support, all within an interactive and enjoyable learning environment. Effectively harnessing technology in the classroom enables teachers to tailor their teaching methods to individual student needs, thereby liberating more classroom time for projects, personalized coaching, and creative educational pursuits (Usluel et al., 2017)

Methods and Materials

Research methodology

This research employs a qualitative approach, integrating qualitative techniques, such as interviews. The primary objective of this research was to explore special education teachers' perceptions and understanding of integration of ICT in their classrooms of special education. To achieve this objective, qualitative research was used. Qualitative studies are designed to delve deeply into the analysis and characterization of a specific case, as outlined by researchers such as Fraenkel et al, (2012) and Yin (2011). They seek to capture the perspectives and viewpoints of the participants involved (Yin, 2011). In this context, a necessity analysis was conducted, aiming to gain insights into the existing and desired conditions pertaining to the subject or phenomenon of investigation, as articulated by the participants. The primary method of data collection employed for qualitative portion of the research was semi-structured interviews conducted with special education teachers. The data gathered through these interviews were subsequently transcribed and subjected to coding, employing the constant comparative approach commonly used in qualitative data analysis.

Participants

The study involved 10 special education teachers working in schools catering to students with special needs in the Ajloun region of Jordan. Given that such schools and teachers are relatively scarce compared to regular public schools, the researcher opted for a referral or snowball sampling method to identify and interview these teachers.

Data Collection

Data for this study was collected through self-developed semi-structured interviews with 10 special education teachers.

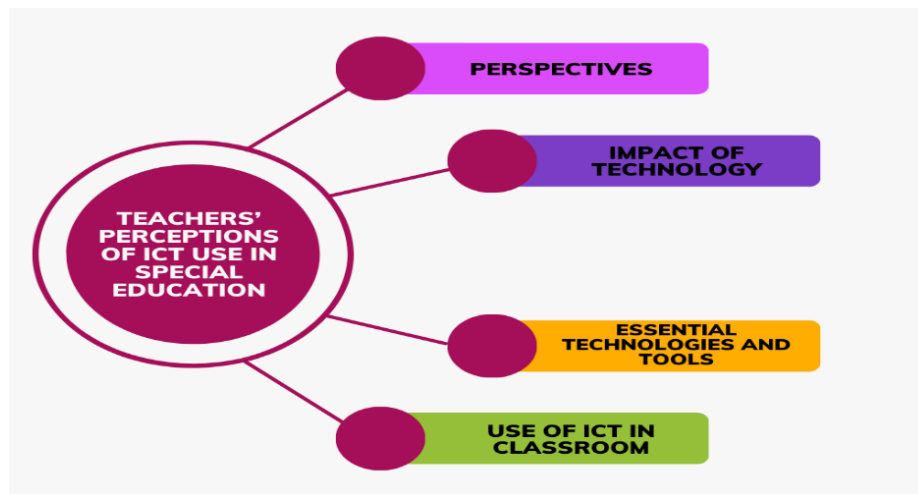
Data Analysis

Content analysis was the main technique used for qualitative data analysis. A qualitative data analysis method called content analysis aids researchers in identifying essential concepts and the connections between them in a given dataset. It starts by locating distinct ideas, frequently referred to as codes, inside the dataset, after which it goes on to arrange and connect these codes in a meaningful way to reveal the data's underlying significance. As Creswell (2007) notes, the core of qualitative data analysis is coding, which entails segmenting raw text into significant chunks while maintaining their relationships. Coding's main goal is to examine, separate, and compare the data (Miles & Huberman, 1994). Researchers have the freedom to use a variety of coding techniques, whether they develop their own framework or use one that already exists in the literature (Creswell, 2007; Miles & Huberman, 1994). Each interview was

recorded and converted into a separate file for each participant's use in the data analysis. A consensus was reached after carefully examining all the facts. This stage is essential because the creation of codes by analysts and the attribution of specific meanings to them have the potential to affect the consistency of coding practises between coders. The codes were classified under more general categories when their respective meanings and codes were defined.

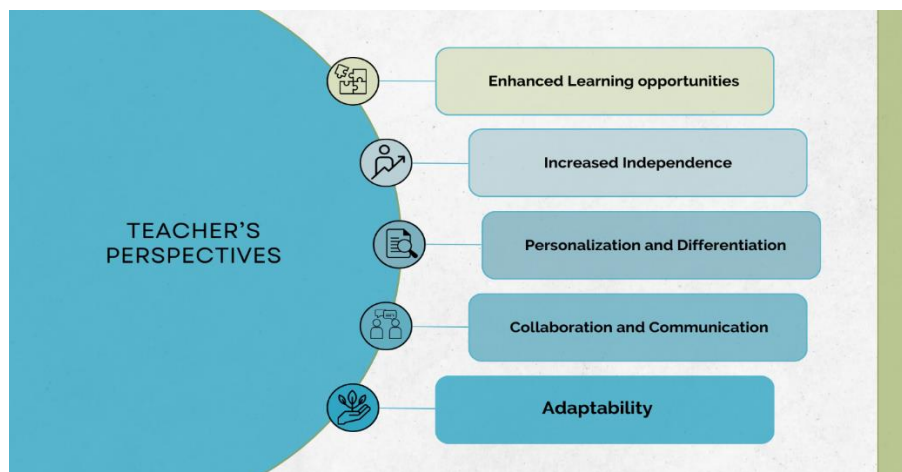
Results and Findings

The study's findings revealed four primary categories for classifying the ideas found in the interview data from special education teachers. These categories, listed from most frequently discussed to least, include teachers' perspectives on technology, the impact of technology on educational outcomes, essential technologies and materials, and teachers' utilization of technology in the classroom. These topics will be discussed in greater detail below.



Teachers' Perspectives on Use of Technology

The first category was perspective of teachers about use of ICT in special education classes. This category, as per teachers' views and opinions was a combination of five distinctive codes which are represented in figure 2 below:



Among these five codes, the first three codes i.e., enhanced learning opportunities, increased independence and personalization and differentiation were focused and mentioned a lot by the respondents. Talking about enhanced learning opportunities, one of the respondents expressed his views as following:

“... I believe that integrating ICT into special education enhances instruction by adjusting it to each student's requirements, promoting inclusiveness, and empowering students with disabilities to take charge of their own learning.”

One of the respondents highlighted the independence and freedom ICT provides to both the teachers and the students and stated:

“ICT gives special education pupils more autonomy and control over their learning process. It provides individualized, self-directed learning experiences that promote self-reliance and independence.”

Another respondent similarly described the independence and ease of work, teachers can have by using ICT in special education classes and said:

“...ICT in special education gives teachers more autonomy and freedom to customize curriculum, resources, and assistance, successfully addressing the various requirements of students. Administrative responsibilities are streamlined, allowing for more individualized and concentrated instruction.”

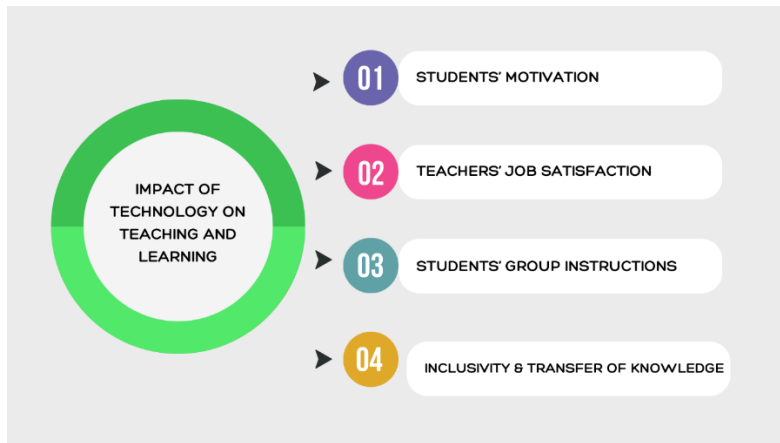
One female special education teacher highlighted the virtues of communication, collaboration, and adaptability which ICT gives to the teachers and said:

“...The use of ICT encourages continuous communication, collaboration, and adaptation between teachers and students, ICT in special education improves learning and fosters a friendly and productive learning environment.”

The respondents emphasize the contribution of ICT to special education. They stress the opportunity for improved learning, personalization, and inclusivity because ICT can adjust to the needs of each individual student, empowering students with disabilities. Additionally, ICT promotes independence and effectiveness for the benefit of both students and teachers. It supports students' self-directed learning by streamlining administrative tasks and allowing teachers to alter materials. ICT also promotes collaboration, adaptation, and communication, which helps to create a positive and effective learning environment. Collectively, these claims demonstrate the transformative potential of ICT in special education, which is consistent with the objective of inclusive education.

Impact of Technology on Teaching and Learning

Education outcomes, including elements like motivation, engagement, accomplishment, and knowledge transfer, have consistently shown significant effects when instructional technology is used in a variety of classroom contexts. The expected impact of technology adoption in special education classrooms is greater than in typical educational settings. In order to determine whether and how the use of instructional technology could affect students' performance across a wider range of academic outcomes, teachers were interviewed. Five key topics emerged from a thorough content analysis of teachers' responses: students' motivation, teachers' job satisfaction, students' group training and instructions, inclusivity and transfer of knowledge and skills. These themes are represented in figure 3 below:



The first code that was emphasized and focused by the teachers was that the use of ICT enhances students' motivation in special education classes. When probed and asked about their perspective, one of the teachers said, "...in special education, ICT use generates excitement among students. Interactive games and applications make learning enjoyable and interesting, which inspires students to participate actively in lessons." While another teacher endorsed by adding "ICT provides a variety of multimedia materials that appeal to different learning preferences and styles, stimulating students' interest and motivating them." Responding to the probe "how ICT helps to motivate students in special education class?" another participant replied and said, "ICT integration promotes independence because it allows students with disabilities to track their progress, which motivates them and gives them an overwhelming feeling of success and satisfaction."

In the realm of special education, a critical challenge faced by educators is the need for repetitive practice and feedback for students, which can often lead to teacher burnout and a diminishing quality of instruction over time. As one experienced teacher insightfully expressed, "Repetitions wear us down, and our feedback tends to lose its impact; at times, I sense a reduction in the words I use during teaching." This exhaustion can impact both the teacher's job satisfaction and the overall effectiveness of their teaching. However, using technology into special education classes can be a potent way to overcome these difficulties. Teachers have access to a multitude of focused and flexible materials when they use technology. These technologies give teachers the tools they need to conduct engaging lessons with greater confidence. They also relieve the pressure of having to create fresh materials all the time. Teachers may have greater job satisfaction as a result of their increased self-assurance since they feel more prepared to handle the responsibilities of their position.

The third piece of code compiles insights regarding the impact of technology on students' group training and instructional methods. In alignment with the initial code, which underscores that students exhibit higher motivation and engagement when technology is incorporated into the classroom, educators have expressed that technology significantly facilitates the execution of group training sessions as opposed to conducting them without technological aids.

In the realm of special education, it's essential to note that the interpretation of "group training" may vary among teachers. Nevertheless, a consensus among educators is that students benefit from peer interaction during these group training sessions, irrespective of the specific skills being taught. One participant provided an illuminating example: "To illustrate, the other day, a student was interacting with red balloons on the screen. I had initially considered demonstrating how to pop the balloons on the touchscreen, but another student spontaneously began popping them, while a third observed. This dynamic interaction led to the realization that 'I should only pop the red balloons.' They learn from one

another." Hence, technology not only enhances engagement but also fosters peer-based learning experiences during group training sessions, even when the skills being acquired are as fundamental as operating a touch screen.

A new era of inclusivity marked using ICT in special education has redefined the learning environment for children with a range of needs. By bridging barriers and empowering students to participate more actively in the educational process, technology is being integrated into education. "ICT has become the cornerstone of inclusivity in our special education classrooms," one teacher exclaims with enthusiasm. It creates an even playing field so that all students, regardless of their aptitudes, can participate fully in the curriculum. As another educator emphasizes, ICT delivers personalized learning experiences that let students advance at their own pace and in their own way. "Technology tailors learning to suit each student's unique requirements," the educator says. It's amazing how it promotes an accepting atmosphere where each child's potential can be realized. In the digital age, ICT's power goes beyond merely using gadgets; it also allows for customized learning opportunities, improves communication, and equips teachers to fulfil the various demands of their pupils. This integration turns special education classrooms into places of inclusivity where all students can succeed and contribute to the learning community.

The difficulty of aiding the transfer of recently learned concepts and abilities in special education is covered in the last section of the content. The challenging issue of encouraging students to apply their learning to real-life circumstances is one of the challenging obstacles in this field. While students' transfer skills may vary, it's frequently noticed that they get the most from a wide variety of examples and repeated practice sessions, all in the context of real-life scenarios. "Transfer of knowledge and information is an intricate puzzle in our school," as one participant so expressively put it. It's a process that, depending on the features of each person, might vary substantially. While some students can apply their knowledge on their own, others require prolonged one-on-one coaching over long periods of time. Teachers confront the difficult task of developing authentic real-world contexts in their drive to help pupils seamlessly integrate their learning into daily life. One participant characterized their efforts by saying, "I attempt to involve students in real situations as much as possible to bridge the gap between classroom learning and everyday life. I try to simulate a shopping environment with money, a cashier, and transactions to offer change, for example, by focusing on money and shopping-related activities.

Several participants stressed the significance of including students' families in the learning process in order to increase the effective transfer of information and skills, extending the training outside of the classroom and into real-life scenarios. Undoubtedly, we teach through games, but it's crucial to make sure that the information and abilities stick around in a practical setting for a long time, as stated by one participant who described this strategy. When speaking with families, I explain the techniques used in class and lay out the criteria for their participation at home. With a wide range of examples, participants also emphasized the important role that technology plays in promoting repeated practice and helping students apply their knowledge and abilities in new contexts. These educators contend that technology provides a flexible toolkit for presenting different instances and circumstances for teaching ideas and abilities. "I use technology as a way to ensure the transfer of information and skills", as one participant attested, "...and it works quite well. I use a ton of examples, and we always end with the students watching instructional videos that are pertinent."

Essential Technologies and Tools

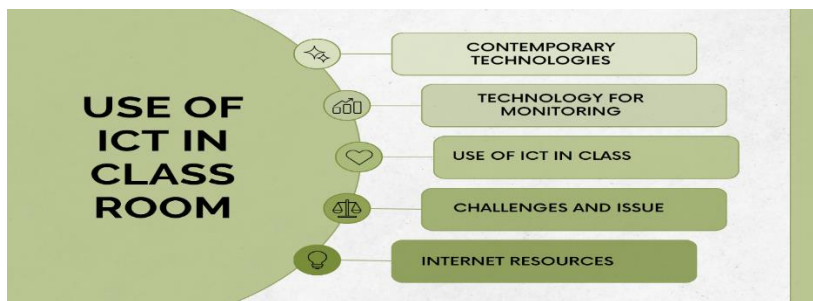
The second category of concepts revolves around the tools and technology used to facilitate teaching and learning within special education classrooms. This category encompasses two key aspects: first, the areas in which technological development is needed, and second, the potential advancements that can be made in technology to address these developmental needs, as suggested by teachers.

Within this category, the initial code concerns the specific developmental areas in which technology can be harnessed for the benefit of special education. The teachers were asked to explain the domains within which these technologies could effectively instruct students in special education. A consensus among most of the teachers emerged, highlighting that the aforementioned technologies can be effectively employed to facilitate instruction in the cognitive, psychomotor, and affective domains. In the cognitive domain, these technologies can be utilized for teaching various concepts, numbers, letters, as well as comparisons such as tall-short, big-small, or directional concepts like left-right and top-bottom. Within the psychomotor domain, teachers placed particular emphasis on utilizing technology to instruct students in fundamental self-care skills, including tasks such as cleaning the face, hands, arms, feet, and legs. The technologies developed as part of the project offer valuable resources for teaching these essential self-care abilities to students with special needs. Additionally, these technologies can be effectively harnessed to address topics within the affective domain, encompassing areas like greeting, expressing and responding to emotions, as well as enhancing socialization skills. Notably, one teacher even suggested that these technologies could be employed to teach students how to dance as a means of fostering socialization and communication with their peers. "It is possible to use the social module", according to an instructor. "...students can participate in solo or group dancing activities, for instance, using game programs created with the Kinect technology." It can help students with learning impairments socialize. The interactive touchpad table can be used to teach ideas like more-less, tall-short, and opposite notions like white and black. These technologies offer innovative and interactive ways to impart such concepts to students in special education.

Building upon the concept of utilizing technology in special education, the second code in this category centers on the potential technologies that can be developed to instruct students in various domains. Teachers provided examples of how the technologies developed within the project can be effectively employed. One teacher illustrated the application of Kinect technology by noting, "This technology proves especially beneficial in physical education classes and is valuable for teaching students about body parts."

Furthermore, teachers underscored the significance of imparting self-care skills and promoting behavior control, particularly in public settings. These technologies hold the promise of addressing these crucial aspects of special education, enhancing the learning experience and fostering students' independence and adaptability in real-world environments. One teacher pertinently emphasized, "It's essential to recognize that a child's knowledge of numerous concepts holds little significance if they cannot perform fundamental tasks such as using the toilet or feeding themselves. Moreover, if behavioral issues prevent them from accompanying their parents to places like the movie theater or shopping center, the ability to use technology becomes secondary in importance." This perspective underscores the fundamental importance of addressing essential life skills and behavior management in the realm of special education, prioritizing practical abilities that facilitate a more inclusive and independent life for students with diverse needs.

Use of ICT in classrooms



Within this category, the codes are related to the current technologies that teachers are accustomed to

using in both their daily lives and classrooms. All the teachers expressed familiarity with contemporary technologies, which encompass desktop and laptop computers, tablet devices, internet access, smartboards, projectors, and cell phones. Moreover, it was noted that these technologies are readily available for teachers to utilize within their school classrooms. Interestingly, teachers are not limited to employing these tools solely within the educational setting; they also make extensive use of them in their personal lives, particularly computers, the internet, and cell phones. This insight indicates that teachers possess the necessary hardware, infrastructure, and knowledge to effectively leverage these technologies both at home and in the classroom.

The second most frequently discussed topic pertained to the utilization of technology for monitoring student performance, a particularly valuable practice within special education classrooms. Monitoring and documenting student progress at regular intervals can be highly beneficial. Teachers in special education employ technology as a tool for this purpose, typically involving the recording of student videos during performance monitoring activities. Subsequently, teachers complete behavior checklists on their computer devices, such as laptops or desktop computers. It's worth noting that while teachers acknowledged the utility of recording student videos to assess progress in learning concepts or skills between measurement points, they tend to rely more on observational methods rather than frequent video recording for this purpose. The third code delves into how teachers currently employ technology in their schools and classrooms, as well as their aspirations for its future use. Teachers reported using desktop or laptop computers for various personal tasks, such as obtaining printouts, and they utilize computer games as rewards for students. Smartboards play a significant role in their teaching methods, serving as valuable tools for instruction and concept practice. Moreover, teachers harness technology as a means of rewarding students for successfully completing learning tasks and providing feedback on their learning progress.

For instance, one teacher illustrated the integration of technology into their teaching approach by describing the use of a smartboard to narrate a story about a particular concept. Following this, students are prompted to answer questions related to the newly acquired concept, with the computer providing immediate feedback to enhance the learning process. This multifaceted use of technology underscores its versatility as a tool for engagement, instruction, assessment, and feedback in the classroom.

In one instance, a teacher provided a vivid example of technology integration in the classroom, describing a learning activity that involved storytelling. During this activity, students listened to a narrative, and at the conclusion of the story, they encountered questions related to the plot. To respond, students interacted with the technology by physically touching the corresponding answers. For instance, if the question was about the blue car and who it had met, the correct response was the yellow car, which students would touch on the screen. In another scenario, a page would display various land vehicles, and students were tasked with selecting the correct one. When they chose correctly, an enthusiastic applause sound resonated, amplifying their sense of achievement. Conversely, if an incorrect choice was made, a disappointed "yes" sound played, adding an element of fun and motivation to the activity. The students thoroughly enjoyed and engaged with this interactive learning experience facilitated by technology.

The fourth code within this category addresses the challenges and difficulties that teachers encounter when attempting to integrate technology into their classrooms. These obstacles can be categorized into two primary issues.

Firstly, teachers cited financial constraints as a major hurdle in obtaining and maintaining the necessary technology. The financial aspect presents a twofold problem: schools often struggle to allocate sufficient funds to equip classrooms with technology, and teachers themselves face limitations due to their salary situations. As one teacher aptly expressed, "First and foremost, there's the financial aspect. Acquiring these

devices requires a certain level of financial capacity, which is not easily attainable for teachers, given their salary circumstances." This underscores the substantial financial burden associated with integrating technology into the classroom. The second significant challenge pertains to the lack of educational materials specifically designed for special education settings. Teachers noted that while they can access materials from the internet or other sources, these resources often necessitate modifications or can only be partially utilized, rendering them incompatible with the special education curriculum. This dearth of tailored materials further complicates the integration of technology in special education classrooms, highlighting the need for more specialized resources to support effective teaching and learning in these settings.

The challenges associated with the scarcity of suitable technological materials in the realm of special education were further emphasized by teachers. One teacher articulated this concern, stating, "The most significant barrier, in my opinion, is the lack of technological materials that cater to our specific needs. The materials we come across on the internet are typically designed for typically developing children, those with typical intelligence levels. I struggle to find materials that are tailored to the unique learning requirements of students with learning disabilities." This perspective was echoed by another teacher who remarked, "Regarding content, we face a shortage of well-developed resources that are directly applicable to special education. While our existing software has its merits, it is confined to a very limited scope and necessitates substantial improvements. It's debatable whether the materials we currently have are truly suitable for special education. Before we can use them effectively, we often have to make simple adjustments or pause during instruction to ensure they are accessible to our students. Issues related to colors, brightness, or other visual features sometimes hinder our students' ability to engage with the material easily." These insights underscore the critical need for more comprehensive and tailored educational materials and technology resources that align with the diverse learning needs of students with disabilities.

The fifth code in this category pertains to the internet resources that teachers find useful and rely on for teaching purposes. While all the teachers demonstrate competency in using computers with internet access to source teaching materials for themselves and their students, they have identified certain limitations with these resources, particularly in the context of special education.

It's noted that the available materials are typically designed for early childhood education teachers, thus falling short of meeting the unique needs of special education instructors. Furthermore, some teachers expressed dissatisfaction with the quality of materials found on national educational portals, prompting them to opt for visuals and resources from foreign websites. One teacher encapsulated this sentiment, stating, "When conducting internet research, I tend to utilize foreign websites. I find that the visuals and materials, in particular, are of better quality on these sites. Moreover, I receive instructional materials, visuals, and daily plans sent to me via email, which have been recently uploaded to these websites." This highlights the inclination among special education teachers to seek high-quality and specialized resources beyond the confines of local portals to better serve their students' needs.

Discussion and Conclusion

This study's main goal was to learn more about special education teachers' opinions on educational technologies, particularly those that were created as part of a project to generate instructional materials for special education teachers and students. A needs analysis was conducted to determine the current and desired levels of technology integration in special education classrooms as part of the research's initial phase. Content analysis was used to the information received from special education teachers. Four key themes emerged from the analysis of the data. Participants first shared information about how they used technology in their classroom settings.

In the realm of education, technology plays a pivotal role in various aspects, such as student tracking, accessing specialized instructional tools, and utilizing educational materials tailored for special education. The educational value of animations, whether integrated into computer programs or presented in video formats, is widely acknowledged. However, the effective utilization of technology in special education classrooms faces significant challenges. These challenges include infrastructural gaps, a dearth of educational resources, and limited access to technology among families. Despite the rapid development and increased accessibility of technology in many areas, the persistent lack of access to essential technological infrastructure and devices poses a substantial barrier for special education teachers. This obstacle undermines the optimistic expectations surrounding the integration of technology in special education, aligning with prior research that has consistently identified access restrictions as a major impediment to the successful incorporation of technology in educational settings (Cagiltay et al., 2019; Pittman & Gaines, 2015; Bingimlas, 2009; Maida, 2015). The challenge extends beyond the classroom, reflecting broader societal disparities in access to technology and exacerbating the difficulties faced by special education teachers in providing comprehensive and inclusive educational experiences for their students. Efforts to bridge these gaps and enhance accessibility are crucial to unlocking the full potential of technology in special education.

Top of Form

Teachers also emphasized the lack of resources designed expressly for pupils in special education. They frequently fall back on using pieces of early childhood education resources that don't satisfy the standards of the curriculum or the teachers themselves. Especially for teaching concepts, communication skills, and self-care skills to kids, participants noted that technology might be a useful tool in special education. This emphasizes how critical it is to have curriculum-aligned computer-based educational materials readily available. This issue reflects the general educational environment, where the scarcity of curriculum-focused computer-supported materials continues to be a significant roadblock to the efficient use of technology in special education classrooms, as found in earlier study (Cagiltay et al., 2019; Bingimlas, 2009; Shi & Bichelmeyer, 2007)

Third, participants stressed that using technology in the classroom has the ability to improve the standard of educational outcomes for both instructors and students. It helps keep students motivated to complete their assignments, but it also supports teachers during practise and feedback sessions, ultimately enhancing job satisfaction. This is consistent with earlier studies' findings that highlight the beneficial effects of technology on student engagement and teacher satisfaction (Karunamoorthy et al., 2020; Katsarou, 2020; Kuzembayeva et al., 2022)

Fourthly, the study showed that teachers use technology positively in both their professional and personal lives. When individuals see the technology as useful for their work or daily lives, they show eagerness for learning new technological abilities. Due to time and resource restrictions, they might not feel pushed to learn new technology unless it becomes absolutely required. The use of the curricular approach in the courses is one of the key variables in the integration of technology into the classroom, which has been extensively examined. The curricular approach has a big impact on learning and teaching activities, and it determines how teachers use technology in the classroom. This finding is consistent with the literature, which contends that when the curriculum promotes the use of new instructional tools, teachers are more likely to adopt them (Cothren & Rao, 2018; Hew & Brush, 2007; (Hennessy et al., 2015).

The results of the study make it clear that there is a lot of room for the creation of materials specifically for the special education sector. Beyond developing educational materials for children that make use of technology like body movement tracking, touch displays, and smart toys, it is also crucial to train teachers on how to use these tools effectively in the classroom. Parents should also have the information and

abilities necessary to continue their child's education at home. These resources can be extremely helpful teaching aids for instructors who want to impart social, cognitive, and self-care concepts to students. By providing adequate practice opportunities, constructive criticism, and exposure to a variety of real-life circumstances, they also assist students in consolidating and applying their skills and knowledge to new contexts (Cagiltay et al., 2019; Abel et al., 2022).

The ability of educational technology materials for special education to enable several practice sessions and offer insightful feedback to both students and teachers is a crucial factor to take into account. Furthermore, the circumstances in which the targeted skills or information are utilised in real-life situations should be precisely modelled in these materials. This guarantees that students can effectively generalize their knowledge and apply it to real-world scenarios.

While teachers recognize the potential for technology to enhance teaching and learning in special education, it is evident that there is an expectation within the special education teacher community for professional development opportunities. These programs are essential for equipping teachers with the knowledge and skills needed to effectively integrate educational technology into special education classrooms. In addition to the development of materials tailored to students' special needs, it is imperative to design professional development initiatives that orient teachers to the benefits of educational technology in special education and provide systematic guidance on its use. Such initiatives are vital for schools to effectively harness the power of technology in special education.

Like any educational study, this research has certain limitations. Although participants in this study were selected using a referral sampling method, it's worth noting that not all teachers had a background in special education. Some of the participating teachers had originally been elementary or early childhood education teachers and later completed a certificate program to become special education teachers. Consequently, their level of experience in special education may not be as extensive as that of teachers with formal training in the field. Another limitation pertained to the weak technological infrastructure in special education schools. The scarcity of hardware and supporting educational software may have limited participants' exposure and experience with technology in comparison to teachers in other schools where technology resources are more abundant.

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