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**Saudi Teachers' Recommendations
for Using Smartboards with Students
with Communication Disorders**

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Abstract

Integrating smartboards into classrooms for students with communication needs represents a practical approach to incorporating technology in education. Prior research has demonstrated the advantages of smartboard use for students with disabilities (SWDs) and second-language learners. However, limited attention has been given to understanding teachers' recommendations for using smartboards with students who have communication needs. To address this gap, I conducted an exploratory qualitative study examining Saudi teachers' recommendations regarding smartboard use in classrooms serving students with communication needs. Data were collected through in-depth interviews and analyzed using reflexive thematic analysis. The findings revealed that teachers emphasized the importance of training and professional development to enhance effective smartboard use. The implications of this study point to the necessity of additional research to further explore teachers' perceptions of smartboard integration for students with communication needs, as well as the importance of offering targeted training and encouraging self-directed learning opportunities for both preservice and in-service teachers to improve their use of smartboards in inclusive classrooms.

Keywords: Students with Communication Needs, Smartboards, Teacher Perceptions, Reflexive Thematic Analysis, Saudi Arabia

توصيات المعلمين السعوديين حول استخدام السبورات الذكية مع الطلاب ذوي اضطرابات التواصل

د/ محمد القحطاني

مستخلص الدراسة

يُعدّ دمج السبورة الذكية في الفصول الدراسية للطلاب ذوي الاحتياجات التواصلية أحد الأساليب العملية لتوظيف التكنولوجيا في التعليم. وقد أظهرت الدراسات السابقة فوائد استخدام السبورة الذكية مع الطلاب ذوي الإعاقة ومتعلمي اللغة الثانية. ومع ذلك، لا يزال هناك نقص في الفهم المتعمق لتوصيات المعلمين حول استخدام السبورة الذكية مع الطلاب ذوي اضطرابات التواصل. ولتغطية هذا الجانب، أُجريت دراسة نوعية استكشافية هدفت إلى استكشاف توصيات المعلمين السعوديين بشأن استخدام السبورة الذكية في الفصول الدراسية التي تضم طلاباً ذوي اضطرابات التواصل. جُمعت البيانات من خلال مقابلات متعمقة، وتم تحليلها باستخدام التحليل الموضوعي الانعكاسي. أظهرت النتائج أن المعلمين أكدوا أهمية التدريب والتطوير المهني لتعزيز الاستخدام الفعال للسبورة الذكية. وتشير دلالات الدراسة إلى ضرورة إجراء مزيد من الأبحاث لفهم تصورات المعلمين حول دمج السبورة الذكية مع الطلاب ذوي اضطرابات التواصل، إضافة إلى أهمية توفير برامج تدريبية موجهة وتشجيع التعلم الذاتي لكل من معلمي ما قبل الخدمة والمعلمين أثناء الخدمة لتحسين استخدامهم للسبورة الذكية في الفصول الدراسية الشاملة.

الكلمات المفتاحية: الطلاب ذوو اضطراب التواصل، السبورات الذكية، تصورات المعلمين، التحليل الموضوعي الانعكاسي، المملكة العربية السعودية.

INTRODUCTION

Communication, Technology, and Theoretical Frameworks in Education Communication is fundamental for human interaction and engagement across the lifespan. Scudder (1980) asserted that all living beings connect through various means, including movement, sounds, gestures, language, and other forms of expression. His notion underscores the importance of understanding communication processes, particularly when addressing the needs of students with communication challenges in educational contexts. Communication allows individuals to express needs, pursue desires, comprehend others, and build social relationships. Despite global progress, Marshall et al. (2024) reported that communication disorders are usually hidden and unseen by others, as there are almost 240 million children experiencing disabilities. Also, Wylie et al. (2013) noted gaps in epidemiological data on communication disorders. Available statistics reveal that communication needs are widespread: 15.1% in the United States, 18.5% in Australia, and 18% in the United Kingdom. These figures confirm that individuals with communication disorders form an integral part of society, including schools, where educators must adapt interaction methods to ensure students achieve their potential.

Technology has become a central feature of modern life, embedded in homes, workplaces, and schools, and is now a dominant mode of communication. According to the Aging In Place website (2025), 3.2 billion people worldwide actively use the internet, reflecting its ubiquity. In education, technology plays a critical role in supporting interaction and learning. Anderson and Putman (2020) emphasized that special education teachers' understanding of technology enhances their ability to facilitate

learning among students with disabilities. Among the most widely adopted classroom technologies is the smartboard. Akar (2020) reported its prevalence in the United Kingdom, where all primary and 98% of secondary schools use them, and in countries such as the Netherlands, Denmark, and Australia, where 60–70% of classrooms are equipped. In the United States, Canada, and Spain, roughly 50% of classrooms employ smartboards. Research by Wood and Ashfield (2008) indicates that smartboards are effective only when teachers understand their functions and applications.

Smartboards, a specific type of interactive whiteboard, offer advanced features such as up to twenty simultaneous interactions, enabling dynamic and collaborative learning (Johnes, 2025). In this study, the English term “smartboard” was used for clarity in the Saudi context and international relevance. Nichols (2015) described smartboards as wall-mounted touch screens connected to projectors that allow direct manipulation of digital content. These tools support flexible instruction, enhance communication, and promote participation through various interactive features. Aligned with Universal Design for Learning (UDL) principles (Bauder et al., 2020), smartboards foster inclusivity and communication among all students, including those with communication disorders.

Special Education and Communication Disorders in Saudi Arabia
Special education in Saudi Arabia has evolved significantly since the late 1950s, beginning with family-based education before the establishment of the Special Education Unit in 1962 (Aldabas, 2015). Between 1960 and 1971, separate institutions for boys and girls with disabilities marked the start of formal special education (Alquraini, 2011). Major milestones include the 1987 Disability Law and the 2000 Disability Code, which promoted equal

rights and access to services (Saudi Arabia's National Unified Portal for Government Services, 2022). Influenced by the U.S. IDEA, the Ministry of Education introduced the 2001 RSEPI/RRSEP regulations emphasizing inclusion and specialized support (Alquraini, 2014). The 2016 Regulatory Guides for Special Education (RGSP) further refined these practices, and today, Saudi Arabia defines disability broadly, representing 7.1% of the population (Abu-Alghayth et al., 2022; Saudi Arabia's National Unified Portal for Government Services, 2025).

Communication disorders, a major category within this system, are defined as impairments in obtaining, delivering, or understanding messages through verbal, nonverbal, or symbolic means (American Speech-Language-Hearing Association, 2025). Prevalence estimates indicate that 3.32% of the population, or 667,280 individuals, have speech and communication disorders (Al Awaji et al., 2021), though data specific to schools remain limited. One study estimated 114,500 children with disabilities in inclusive classrooms, with 2.9% experiencing speech or language impairments (Alsolami, 2024). Services remain insufficient, as speech and language rehabilitation is primarily offered through the private sector (Alanazi, 2017). Although audiology and speech-language pathology (SLP) were introduced three decades ago, bachelor's programs are still absent from Colleges of Education, and only three universities offer programs in applied medical sciences (Alanazi & Al Fraih, 2021). The Saudi Society of Speech-Language Pathology and Audiology (SSSPA), founded in 2003, has worked to raise awareness, but further exposure is needed. The government's Vision 2030 aims to expand opportunities for individuals with disabilities through education, rehabilitation, and employment initiatives, while enhancing

support services to promote independence and integration into society (Abu-Alghayth et al., 2022; Saudi Arabia's National Unified Portal for Government Services, 2025).

Theoretical Frameworks

This research was guided by two theoretical frameworks that illuminate the communication process when technology is integrated into classrooms: the Speech Act Theory and the Human Activity Assistive Technology (HAAT) Model. The Speech Act Theory, advanced by Searle and Bierwisch (1980), emphasizes the centrality of linguistic units, whether words, symbols, or movements, as essential elements of communication. This perspective draws attention to the multiple ways students with communication disorders can express meaning and engage in interaction.

The HAAT Model (Cook & Hussy, 2002) situates assistive technology within a broader system that includes the human, the activity, the technology, and the context. Within this study, the model identifies the student with a disability (human), the learning tasks (activity), the smartboard (assistive technology), and the classroom (context). Together, these frameworks provide a robust foundation for examining how smartboards can enhance communication and participation for students with communication needs.

Purpose and Significance of Study

Technology is deeply integrated into education, with smartboards commonly used in classrooms, yet little is known about their use with students who have communication needs. While prior studies have examined smartboards with students with disabilities or second language learners, none

have focused specifically on teachers' recommendations in using smartboards with students with communication disorders. In Saudi Arabia, limited teacher preparation highlights the need to understand educators' perspectives on supporting these students. This study explored Saudi teachers' recommendations on using smartboards with students who have communication needs, identifying both benefits and challenges. The findings aim to inform teacher training and enhance inclusive teaching practices that improve communication and learning outcomes. To understand Saudi teachers' recommendations, I had the following research question: What are the recommendations of a select sample of teachers of students with communication needs in Saudi Arabia for the use of smartboards with students with communication needs in the classroom?

Definition of Terms

Communication

Communication is the individual's ability to transfer and understand information and meaning (Zebron et al., 2015).

Students with Communication Needs

Students with communication needs have a disorder that impacts their ability to obtain, deliver, and understand concepts or verbal, nonverbal, and visual symbol systems. Also, the disorder might be in hearing, language, and speech procedures. Communication disorders can range from mild to severe, and individuals may have one or more communication disorders (American Speech-Language-Hearing Association, 2025).

Smartboard

A smartboard is attached to the wall with a touch screen linked to a projector (Nichols, 2015).

Teachers' Perceptions

Teachers' perceptions are teachers' views or rational descriptions of their students, lessons, activities, and materials. Teachers' experiences and background awareness build those perceptions (The IRIS Center, 2012).

LITERATURE REVIEW

I conducted a literature search on studies involving students with communication needs and smartboard use using databases such as ERIC, Education Source, Google Scholar, and APA PsycINFO. The review focused on two areas: the learning characteristics of students with communication needs and the use of smartboards in schools. While some studies explored technology use or smartboards, few addressed students with communication needs specifically. This gap underscores the importance of connecting these two areas to inform inclusive practices. Understanding these gaps guided the purpose and significance of the present study.

Students with Communication Needs

Understanding the characteristics and instructional needs of students with communication challenges is crucial for effective classroom practice, especially when using tools such as smartboards. The American Speech-Language-Hearing Association (ASHA, 2025) defines communication disorders as difficulties in acquiring, conveying, or comprehending concepts through verbal, nonverbal, or symbolic systems, which may involve hearing,

speech, or language processes. Disorders can range from mild to severe, and individuals may experience more than one. For this review, communication needs include language impairments, hearing loss, selective mutism, autism, stuttering, cluttering, and nonverbal learning disabilities.

Language Impairments

Language impairments affect comprehension and expression across speaking, writing, and symbolic systems, including phonology, morphology, syntax, semantics, and pragmatics. Nearly 7% of Americans experience such impairments (ASHA, 2025). These difficulties can affect academic performance, social skills, and communication, often leading to behavioral issues, bullying, and lower self-esteem (Abed & Shackelford, 2021). Students with language impairments may also face challenges with reading due to weak phonological and semantic processing (Lowman & Dressler, 2016).

Hearing Loss

Hearing loss, ranging from mild to profound, affects millions of children worldwide (World Health Organization, 2025). It impacts language development and communication, and students may struggle with acoustics, directions, or verbal instructions in noisy classrooms (Van der Straaten et al., 2021). While inclusion offers benefits, challenges persist without proper support. Visual methods, such as smartboards, enhance motivation and understanding (Alasim, 2019). Teachers must also consider seating arrangements, social-emotional issues, and training needs to ensure effective communication with students who are deaf or hard of hearing (Su et al., 2020).

Selective Mutism

Selective mutism is an anxiety disorder in which children cannot speak in certain contexts while speaking freely in others, often beginning in

childhood and persisting if untreated (National Health Service, 2023). More common among females and second-language learners, it involves withdrawal, limited vocabulary use, and difficulty with peer relationships (Klein et al., 2019). Distinct from social anxiety, selective mutism involves specific speech-based fears and behavioral patterns (Kearney & Rede, 2021).

Autism

Autism affects approximately 1 in 36 children in the U.S. and 1 in 100 globally (Autism Speaks Organization, 2025; World Health Organization, 2025). Communication difficulties include limited pragmatic language, challenges with joint attention, and difficulty initiating or responding to interactions (Sutton et al., 2019). These factors can lead to social isolation and reduced classroom participation (Banire et al., 2020). Because autism manifests differently across individuals, teachers must adapt strategies, such as using smartboards for visual instruction and minimizing distractions, while considering verbal and nonverbal communication needs.

Stuttering

Stuttering, which affects about 1% of the population (National Stuttering Association, 2025), is marked by speech disfluencies that may cause avoidance of speaking and anxiety (Yaruss et al., 2012). Students who stutter may appear shy or reluctant to communicate (Berchiatti et al., 2020). Effective strategies include slowing teacher speech, increasing response time, and educating classmates about stuttering (Davidow et al., 2016).

Cluttering

Cluttering, a fluency disorder similar to stuttering, involves rapid or irregular speech, disorganized phrasing, and limited self-awareness (ASHA,

2025). Children with cluttering may appear excitable or inattentive, and their unclear speech can be mistaken as careless (Scott, 2020; Wesierska et al., 2021).

Nonverbal Learning Disabilities

Nonverbal learning disabilities (NVLD) affect two to three million individuals in the U.S. and involve deficits in visual-spatial reasoning, math, and social skills, despite strengths in vocabulary and memory (Margolis et al., 2020; Lucas et al., 2020). Students may misinterpret body language, facial expressions, or abstract concepts (Darrow, 2016).

Students with communication needs represent a diverse group whose challenges affect academic, social, and emotional development. Teachers play a central role in recognizing these needs and adapting communication strategies, with smartboards offering flexible tools to present information visually, reduce barriers, and support inclusion. By understanding each disorder's characteristics, educators can enhance learning outcomes and promote more effective communication for students with diverse needs.

Using Smartboards in the Classroom

Smartboards are widely used in schools, but little is known about their use with students who have communication needs. Although no studies focus exclusively on this group, existing research on students with disabilities, English language learners, and science instruction provides useful insights. Four themes emerge from the literature: the timing of smartboard use, teachers' reasons for using them, their application with students with disabilities, and the importance of training and professional development.

Timing of Smartboard Use

Teachers vary in how often they use smartboards in their classrooms. While most hold positive attitudes, usage levels differ due to the time and planning required for effective integration (Bıçak, 2019; Preston et al., 2015). Many educators rely on smartboards primarily for lectures rather than interactive learning, limiting their instructional potential (Martin et al., 2014). However, when teachers use smartboards throughout lessons, studies show higher student engagement and improved learning outcomes (Allsopp et al., 2012; Martin et al., 2014). Understanding when and how teachers incorporate smartboards provides insight into their instructional practices and attitudes toward technology.

Reasons for Smartboard Use

Teachers adopt smartboards mainly to integrate technology and enhance student learning. Smartboards enable multimodal communication—combining visual, verbal, and interactive elements to meet diverse learning needs (Anderson & Putman, 2020; Fallah, 2016). For instance, visual supports such as videos and text help students with hearing loss or limited verbal skills. Teachers also appreciate that smartboards allow lesson materials to be accessed beyond classroom hours, supporting continuous learning. Research links smartboard use to improved retention, motivation, and classroom participation (Aktas & Aydin, 2016; İstifçi et al., 2018). Students often report greater enjoyment and engagement during smartboard-based lessons, as the technology supports interactive slides, videos, and dynamic content delivery.

Use with Students with Disabilities

Extensive research highlights the positive impact of smartboards on students with disabilities, improving participation, motivation, and skill acquisition across varied needs such as autism, hearing loss, and intellectual disabilities (Mechling et al., 2009; Yakubova & Taber-Doughty, 2013; Drigas & Papanastasiou, 2014; Shepley et al., 2016). Drigas and Papanastasiou (2014) found that students with writing difficulties showed greater motivation when using smartboards to interact with text. Similarly, Allsopp et al. (2012) identified eight effective features of smartboard use—interaction, feedback, differentiation, visual support, attention, explicitness, content specificity, and data-driven planning—each of which benefits learners with disabilities.

Research also demonstrates that smartboards can facilitate independence and peer learning. Yakubova and Taber-Doughty (2013) showed that video modeling and self-monitoring activities on smartboards helped students with autism and intellectual disabilities acquire new skills. Campbell and Mechling (2009) found that combining smartboards with computer-assisted instruction improved letter-sound recognition in students with learning disabilities. Mechling et al. (2009) and Shepley et al. (2016) further confirmed that smartboards enhance sight-word recognition, especially through peer observation and interactive instruction. Collectively, these studies demonstrate that smartboards foster inclusion, independence, and engagement among students with disabilities, including those with communication needs.

Training and Professional Development

The effectiveness of smartboard use depends greatly on teacher training. Flory (2012) emphasized that owning technology alone is insufficient—teachers must understand its pedagogical applications. Training should begin in preservice teacher preparation and continue through professional development opportunities (Martin et al., 2014). Universities play a key role in equipping future educators for technology integration, while in-service teachers benefit from workshops and hands-on sessions (Bıçak, 2019). Evidence consistently shows that training shapes not only how teachers use smartboards but also their confidence and creativity in doing so (Allsopp et al., 2012; Flory, 2012; Martin et al., 2014; İstifçi et al., 2018).

Overall, research indicates that smartboards are powerful instructional tools that enhance engagement, motivation, and learning outcomes across diverse classrooms. Their benefits are most evident when teachers are well-trained and use them interactively rather than passively. Despite this, few studies have explored smartboard use specifically with students who have communication needs. Addressing this gap is essential for promoting inclusive education and guiding professional development that empowers teachers to use smartboards effectively with all learners.

METHODS

Research design

I employed an exploratory qualitative study to discover teachers' recommendations of smartboard use with students with communication needs in the classroom. Barroga and Matanguihan (2022) stated that researchers use exploratory qualitative studies to search for areas that have

not been fully studied to have a deeper meaning and understanding of the research idea. Aspers and Corte (2019) stated qualitative research is a reduplicated procedure that increases the understanding of the professional in the field by having new important distinctions arise from getting closer to studying the phenomenon.

Sampling and Participants

Several factors influenced participant selection and sample size. Vasileiou et al. (2018) noted that saturation, as well as pragmatic factors such as time and financial constraints, affect determining sample size, and that researchers must evaluate data adequacy responsibly. I determined that seven teachers were sufficient, as saturation was achieved. As I analyzed the interview data, recurring patterns emerged, and by the sixth participant, no new information appeared; I added a seventh to confirm saturation. Morse (2015) explained that saturation aims to develop rich, replicable data for building theoretical concepts, which occurred through consistent interview protocols and observations. The teachers served as the units of analysis, including five males and two females, all meeting the inclusion criteria: public school employment in Saudi Arabia, over two years of smartboard use, and experience teaching students with communication needs. Table 1 presents participant characteristics. I used intensity sampling under purposeful sampling to select participants who would best serve the study's goal (Patton, 1990), focusing on schools with teachers who use smartboards with students with communication needs. I then applied snowball sampling to recruit additional participants, as Atkinson and Flint (2001) described this approach as effective for explorative and descriptive qualitative studies.

Ethics and Diversity

I followed university Institutional Review Board (IRB) regulations to ensure participants' legal and ethical protection, maintaining confidentiality by anonymizing data, informing participants of their rights, and emphasizing voluntary participation.

Table (1)

Participant Characteristic

Participants	Years of Using Smartboards	Grade Level	Type of Students with Communication Disorder	Number of Students with Communication Needs
Salem	4	Fifth/ Sixth	Language Impairments Hearing loss	2
Bayan	5	Ninth	Language Impairments Autism	5
Anas	4	Tenth/ Eleventh	Stuttering Hearing Loss	2
Ahmed	14	Third/ Fourth	Language Impairments Hearing loss Autism	5
Noora	6	Eighth/ Ninth	Language Impairments Autism	4
Faleh	5	Seventh/Ninth	Language Impairments	3
Khalid	10	Fourth/ Fifth	Language Impairments Hearing loss	3

Note. This table shows the characteristics of participants in the study.

Data Collection

I conducted virtual interviews via Teams. Oliffe et al. (2021) claimed using virtual means to conduct interviews gives participants the control to manage their videos or even get out of the entire conversation. I used a semi-structured interview type. DeJonckheere and Vaughn (2019) claimed researchers commonly use semi-structured interviews in qualitative research. The researcher would have a conversation with the participants with an interview protocol, follow-up questions, probes, and comments when using semi-structured interviews.. While I did the interviews, I recorded the teachers' language, facial expressions, emotions, and buddy. I wrote memos to record my impressions and thoughts about the process of conducting the interviews (Mihas, 2022).

Data Analysis

I applied reflexive thematic analysis to code and interpret the data. I followed the five-step process described by Richards (2022): (1) know the data, (2) code the data, (3) categorize the data, (4) create themes, and (5) interpret the data. Saldaña (2021) guided my coding procedures, assisting with systematic categorization and development of code families. This combined approach enabled iterative movement between raw data and emerging themes.

Trustworthiness

Reflexive thematic analysis enhanced the quality of data collection by emphasizing meaning at each step (Richards, 2022), while I strengthened trustworthiness through credibility, transferability, confirmability, and dependability (DeJonckheere & Vaughn, 2019). I ensured credibility by

transcribing interviews, conducting member checks, and confirming participants' reflections on my interpretations, and I supported transferability through rich descriptions of context, participants, and procedures (Shenton, 2004). To ensure confirmability and dependability, I minimized bias by following systematic procedures, sought expert review of my coding and themes, and provided detailed documentation to allow replication and contribute to future research.

DISCOVERIES

In this section, I present the discoveries of seven Saudi teachers regarding recommendations for using the smartboard with students with communication needs in the classroom. I discuss the overall theme and sub-themes that emerged from the data. The theme is presented individually with supporting quotes from teachers, followed by a cross-theme analysis of the discoveries in relation to the research question. The table below, *Theme and Sub-themes*, Table 2, presents the theme and the associated sub-themes.

Table (2)

Themes and Sub-themes

Themes	Sub-Themes
Teachers' recommendations about the need for training and professional development in smartboard use	Development and training by the Ministry of Education Continuous learning and self-development

Note: This table shows the theme and associated sub-themes.

Teachers' perceptions about the need for training and professional development in smartboard use

The main theme is *teachers' recommendations about the need for training and professional development in smartboard use*. The theme is about the appropriate training and professional development regarding smartboard use. Teachers explained their need to have more training and professional development when they used the smartboard. I discovered the theme, along with two sub-themes, as depicted in Figure 1, the theme map. The theme map shows the theme and the sub-themes. The first sub-theme is the development and training provided by the Ministry of Education, and the second sub-theme is continuous learning and self-development from teachers themselves.

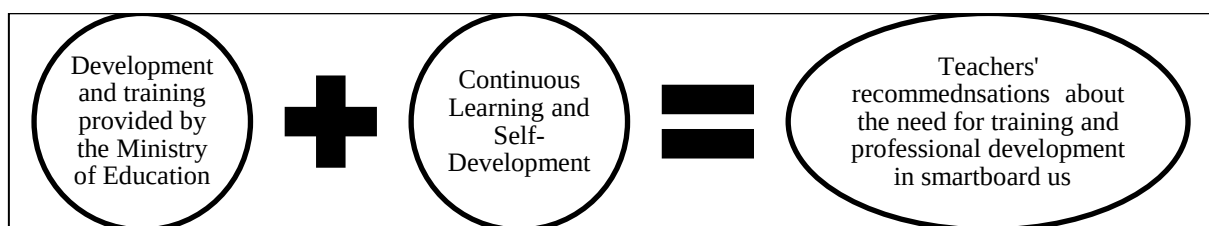


Figure (1)

Theme Map

Sub-Theme One: Development and Training Provided by the Ministry of Education

The main point of this sub-theme is the development and training provided by the Ministry of Education for teachers to use the smartboard in the classroom with students with communication needs. In the interviews, the seven teachers discussed the importance and need for the development and training that the Ministry of Education offers for them and other teachers to use the smartboard in effective ways. Each teacher shared a similar example of how the Ministry of Education can provide development and training. Below, I share some of their quotes, which mention the development and training provided by the Ministry of Education.

Salem explained how training provided by the Ministry of Education is vital for using the smartboard in the classroom. He highlighted the responsibility of the Ministry of Education to provide training and how the training is important for smartboard use.

Salem, "I said a good training for technology from the Ministry because whenever I understood the technology, I used the smartboard well. Sometimes, some modern programs require you to provide good training. If you master the program and know more about smartboards, it will reflect positively on the student. Most of the time, the smartboard is used with software or videos. If you have good training, anything related to technology is reflected in the student. The Ministry also needs to provide modern smartboards and place them in the classroom in the appropriate place."

Ahmed explained how the training and workshops provided by the Ministry of Education in schools can help teachers use the smartboard in the classroom. He highlights in particular how having practicing teachers do the training is most effective.

Ahmed, "Training courses from the Ministry... The Ministry offers courses that greatly assist in using the smartboard... An exchange of experiences between teachers, in which a teacher made a difference in the school and has good knowledge of using the smartboard. The teacher conducts the demonstration sessions. He conducts lessons and gives practical sessions to the school principal and a group of teachers, where the lesson is practical in my view. Many people can speak theoretically, but practical is what is important."

Noora mentioned the training provided by the Ministry of Education on using the smartboard in the classroom. She mentioned, in particular,

training for new teachers to use the smartboard with students with communication needs.

Noora, “Training from the Ministry is possible, especially for new teachers, and there should be better training on how to use the smartboard. They should know how to use the smartboard correctly, design appropriate activities, which are normal activities for everyone and appropriate activities for those with difficulties or those who have a problem with communication.”

Anas expressed similar sentiments, but in contrast to an earlier comment regarding the importance of practicing teachers as trainers, this teacher felt that school supervisors or administrators could provide the best training.

Anas, “Training from educational supervision or school administration is what makes it best used. I discovered what is more after attending those trainings... courses for teachers to use the smartboard, how to use it and its secrets, how it is used, what is best, and what are its pros and cons.”

Sub-Theme Two: Continuous Learning and Self-Development

The central idea of this sub-theme is continuous learning and self-development by teachers themselves to use the smartboard with students with communication needs in the classroom. In the interviews, the seven teachers explained that continuous learning and self-development are among the responsibilities of teachers to use the smartboard in effective ways with students with communication needs. Each teacher shared similar examples when they talked about continuous learning and self-development. Below are some illustrative quotes from the raw data with translated versions to clarify the sub-theme for non-Arabic readers.

Khalid explained how continuous learning and self-development are important for teachers when using the smartboard in the classroom. He specifically mentioned self-development and how it is helpful for students with communication needs to use the smartboard.

Khalid, "Recommendations for the teacher: Firstly, he should develop himself...I am talking to the teacher or user of the smartboard. In general, he knows the programs and the features on the smartboard, but by God, we do not know all of them openly, and they are hidden from us, so this is the most important recommendation. If he knows the advantage, it will make the lesson easier for him and make it easier for him to convey the information. We mostly know how to show a picture, book, or presentation in PowerPoint slides on a smartboard and write on a smartboard. There are other programs and activities that we do not know about. Programs and features help you in your activities and performance within a class."

Another teacher explained the importance of self-learning and self-development and how they are involved with the use of the smartboard in the classroom. She pointed out the attempts to try different programs to attract students' attention.

Bayan, "I recommend that teachers use and try several programs in the smartboard. What do things attract students' attention, and what do they like about the programs? The reason is made clear to them because there are programs that students like, love, and participate in. The most important thing is that it involves the student. If the student does not participate in the class, I feel I have not done anything. If I didn't let her contribute to the smartboard with me, I would feel like I did not do anything...many teachers don't like development; they don't like technology; they like the traditional thing. They only use the book, pen, and regular blackboard."

Faleh shared a similar concept and added the suggestion to communicate with the speech-language pathologist or special education teacher to use the smartboard with students with communication needs in the classroom.

Faleh, “The teacher or user of the smartboard must receive training on how to use the smartboard effectively. This will help them learn about the different features available to them and how to use them to meet the needs of students with communication disorders. Work with a speech-language pathologist or special education specialist to determine the best ways to use a smart board with students with communication disorders. These professionals may be able to make specific recommendations based on individual students' needs. The teacher must be flexible and adaptable. The teacher may need to adjust his use of the smartboard to the needs of individual students or the specific needs of the lesson or activity.”

Teachers indicated that development and training should be provided by the Ministry of Education. Also, they emphasized that teachers need to learn skills and gain knowledge by themselves to use the smartboard with students with communication needs.

DISCUSSION

The discoveries covered one primary topic related to the research question. This topic is teachers' recommendations for the use of the smartboard. As mentioned above, I could not locate a previous study focusing on the use of the smartboard with students with communication needs. However, the discoveries from this study align with research findings related to the use of the smartboard in general and recommendations of teachers regarding smartboard use.

Participant Recommendations on Using the Smartboard with Students with Communication Needs

All teachers indicated the importance of training and professional development in using the smartboard with students with communication needs. They explained how training and professional development can improve their knowledge about smartboard use and help them learn different ways to use the smartboard with students with communication needs. Teachers explained that training would be beneficial for pre-service and new teachers to use the smartboard and that in-service teachers need professional development to develop and update their knowledge. Figure 2 depicts the relationship between training and professional development when using the smartboard with students with communication needs.

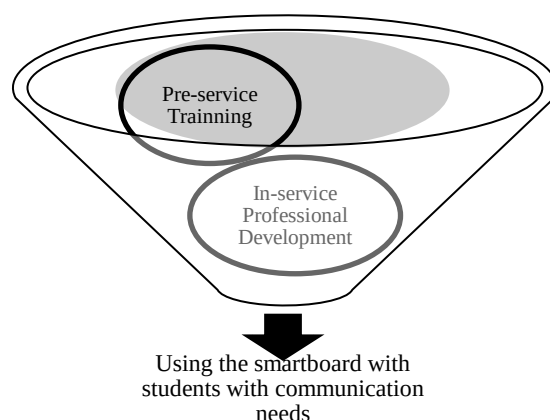


Figure (2)

The Relationship Between Training and Professional Development to Use the Smartboard

Teachers emphasized that training and professional development are linked to better outcomes when using the smartboard with students with communication needs. They highlighted that learning to use the smartboard's programs and features improves teaching practices and student engagement.

Teachers recommended that the Ministry of Education collaborate with schools to identify training needs and provide more workshops focused on students with communication needs, consistent with prior research (Allsopp et al., 2012; Martin et al., 2014; Alghamdi & Higgins, 2018; Anderson & Putman, 2020). They also noted the importance of self-directed learning, encouraging teachers to use online resources, consult speech-language specialists, and share expertise within schools. Furthermore, teachers emphasized the lack of pre-service training and recommended that the Ministry of Education include smartboard instruction in preparation programs while supporting ongoing professional development for in-service teachers (Martin et al., 2014; Mohammed, 2018).

Discoveries in Connection with the Theoretical Frameworks

Understanding different forms of communication in the classroom is essential. This study was guided by the speech acts theory and the Human Activity Assistive Technology (HAAT) model, with findings aligning closely with the speech acts theory. The theory emphasizes minimal units of communication such as words, symbols, or movements and how they combine to create meaning (Searle & Bierwisch, 1980). Teachers described adapting communication methods for students with communication needs, such as written communication for students who stutter or using videos and pictures for students with hearing loss. These findings suggest that understanding speech act theory can help teachers provide alternative communication methods and better address diverse student needs through smartboard use. Figure 3 shows the different ways of communication while using the smartboards with students with communication needs.

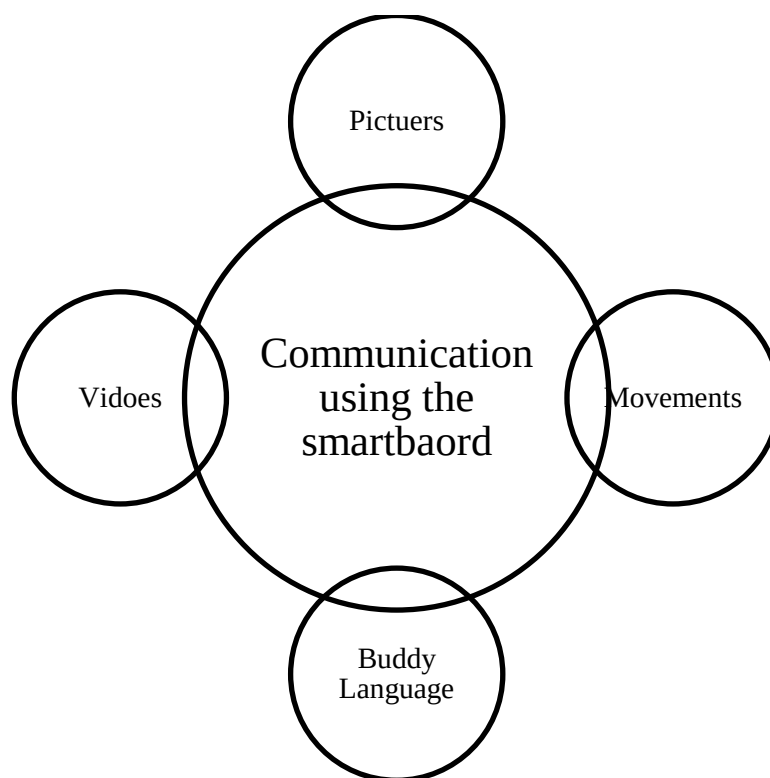
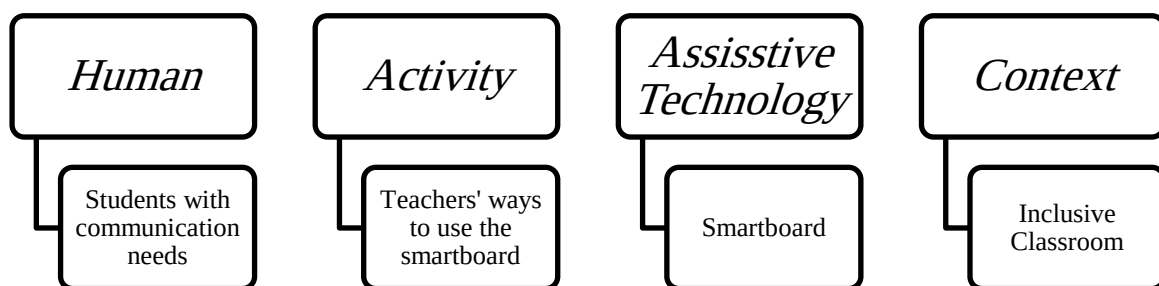


Figure (3)

Various Ways of Communication Using the Smartboard

The Human Activity Assistive Technology (HAAT) model also guided this study. According to Cook and Hussey (2002), assistive technology services should focus on the individual to enhance performance, incorporating the human, activity, assistive technology, and context. In this study, the HAAT model related to students with communication needs, teachers' instructional strategies, smartboard use, and classroom settings. Teachers emphasized adapting lessons, activities, and evaluations to support students with communication needs by using pictures, videos, PowerPoint, Teams, games, and interactive features to facilitate alternative communication. Their recommendations reflected the HAAT model's focus on centering assistive technology use, such as the smartboard, around students' specific communication needs. Figure 4 shows the elements of the HAAT model.

**Figure (4)****Elements of the HAAT Model****Implications for Future Research and Practice****Implications for future research**

This study revealed teachers' recommendations for using the smartboard with students with communication needs, highlighting their methods, experiences, and beliefs within the Saudi educational context. As the first qualitative study to explore this topic, it emphasizes the need for further research using qualitative, quantitative, and mixed-method approaches to deepen understanding of teachers' perceptions and practices. Future studies could examine the relationship between smartboard use and student interaction, explore specific communication disorders, and include students' own perspectives to better inform effective teaching practices. Such research would contribute to improving educational outcomes and advancing the use of smartboards for students with communication needs.

Implications for practice

The findings of this study highlight the importance of comprehensive training and professional development for teachers to effectively use the

smartboard with students with communication needs. The Ministry of Education should establish structured training programs beginning in pre-service preparation and continuing into in-service practice, delivered through university courses, school-based sessions, and online platforms led by experienced educators knowledgeable about communication needs. In addition, ongoing professional development and self-learning are essential for teachers to stay updated on smartboard features, teaching methods, and student needs, supported by collaboration with experts such as speech-language pathologists. These measures would enhance teachers' skills and improve educational outcomes for students with communication needs.

Limitations

The limitations of this study are the potential influence of participants' honesty and the researcher's personal bias toward technology use, despite efforts to minimize both through careful questioning and adherence to research protocols.

Conclusion

This exploratory qualitative study examined teachers' recommendations for using the smartboard with students with communication needs in Saudi Arabian classrooms through interviews and memos. The main theme identified was the need for training, professional development, and self-learning to enhance smartboard use. The findings highlight the importance of ongoing teacher support, government-backed training programs, and future research to expand understanding of smartboard use for students with communication needs. Although participants' honesty and researcher bias were potential limitations, careful procedures were followed to minimize their impact and strengthen the study's outcomes.

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