Determinants of Teachers' Adoption of Assistive Technology for Supporting Students with Specific Learning Disabilities: A Cross-Sectional Survey.

Abstract

The adoption of assistive technology (AT) has become increasingly important in promoting inclusive education and supporting students with Specific Learning Disabilities (SLDs). However, despite the recognized educational benefits of AT, its successful implementation largely depends on teachers' willingness and ability to integrate these technologies into classroom practice. This study investigated the determinants influencing teachers' adoption of assistive technology for supporting students with Specific Learning Disabilities. A quantitative cross-sectional survey design was employed, involving **82 teachers** selected through stratified random sampling. Data were collected using a structured questionnaire comprising eight constructs: knowledge, training, institutional support, self-efficacy, perceived usefulness, perceived ease of use, social influence, and teachers' adoption of assistive technology. Descriptive statistics, reliability analysis, Pearson correlation, and multiple linear regression were performed using IBM SPSS Statistics (Version 29). The findings indicated that teachers reported a high level of assistive technology adoption and positive perceptions across all study variables. Correlation analysis revealed positive relationships between the independent variables and teachers' adoption of assistive technology. However, the regression analysis indicated that the proposed determinants did not significantly predict teachers' adoption of assistive technology in the present study. These findings suggest that although teachers acknowledge the educational value of assistive technology, additional contextual and organizational factors may influence its implementation in educational settings. The study contributes to the literature on technology adoption in special education by extending existing technology acceptance research to the context of teachers supporting students with SLDs. The findings have practical implications for teacher professional development, institutional support, and educational policy aimed at strengthening inclusive education through effective integration of assistive technology.

Keywords: Assistive technology; Specific Learning Disabilities; Teachers; Technology adoption; Inclusive education; Cross-sectional survey

1. Introduction

Inclusive education has become a global priority, emphasizing equitable learning opportunities for all students regardless of their abilities or disabilities. Among learners requiring specialized educational support, students with Specific Learning Disabilities (SLDs) experience persistent challenges in reading, writing, mathematics, and communication that can significantly affect their academic achievement and participation in classroom activities (American Psychiatric Association, 2022). Advances in assistive technology (AT) have created new opportunities to address these challenges by providing tools that enhance access to learning, improve academic performance, and promote greater independence among students with SLD (World Health

Organization, 2024). However, the successful integration of assistive technology into educational practice largely depends on teachers, who play a central role in selecting, implementing, and effectively utilizing these technologies within inclusive classrooms. Understanding the factors that influence teachers' adoption of assistive technology is therefore essential for improving inclusive educational practices and informing policies that support technology integration for students with specific learning disabilities.

1.1 Background

Specific Learning Disabilities (SLDs) are neurodevelopmental disorders characterized by persistent difficulties in learning and using academic skills despite adequate intelligence, conventional instruction, and appropriate educational opportunities. According to the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5-TR), SLDs affect one or more academic domains, including reading (dyslexia), written expression (dysgraphia), and mathematics (dyscalculia), and substantially interfere with academic achievement and everyday functioning (American Psychiatric Association [APA], 2022).

SLDs are among the most common neurodevelopmental disorders affecting school-aged children worldwide. Epidemiological studies estimate that approximately 5%–15% of children experience SLD, although prevalence rates vary according to diagnostic criteria, assessment methods, and educational contexts (American Psychiatric Association, 2022). Students with SLD often experience persistent difficulties in reading, writing, mathematical reasoning, memory, language processing, and communication, which may adversely affect academic performance, classroom participation, and psychosocial well-being.

Educational systems worldwide increasingly recognize that students with disabilities require equitable access to quality education through inclusive teaching practices and appropriate learning support. UNESCO emphasizes that inclusive education seeks to eliminate barriers to learning and ensure that every learner has equal opportunities to participate and succeed regardless of disability or other individual characteristics (UNESCO, n.d.). Likewise, UNICEF estimates that approximately 240 million children worldwide live with disabilities, many of whom continue to encounter significant barriers to accessing quality education and appropriate educational support.

Assistive technology (AT) has become an essential component of inclusive education by enabling students with disabilities to access curriculum content, participate actively in classroom activities, and develop greater independence. The World Health Organization defines assistive technology as systems, services, and products that maintain or improve an individual's functioning and participation in education, employment, and everyday life. Educational assistive technologies, including text-to-speech software, speech recognition systems, digital note-taking tools, communication applications, and adaptive learning platforms, have demonstrated considerable potential for supporting students with SLD across reading, writing, numeracy, and communication domains.

International policy frameworks have further accelerated the adoption of assistive technology within inclusive education. The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) affirms the right of people with disabilities to inclusive education, while Sustainable Development Goal 4 (SDG 4) calls for inclusive and equitable quality education for all learners. UNESCO identifies inclusion and equity as fundamental principles for achieving quality education, emphasizing that schools should provide accessible learning environments, trained teachers, and appropriate educational technologies to support diverse learning needs.

Despite growing recognition of the educational benefits of assistive technology, its integration into classroom practice remains inconsistent. Teachers frequently report barriers including insufficient professional training, limited institutional support, inadequate technological resources, and lack of confidence in selecting and implementing appropriate assistive technologies. Consequently, understanding the determinants that influence teachers' adoption of assistive technology has become increasingly important for promoting effective implementation of inclusive education policies and improving educational outcomes for students with specific learning disabilities.

1.2 Problem Statement

Assistive technology (AT) has been recognized as an effective means of improving learning outcomes and promoting inclusive education for students with Specific Learning Disabilities (SLDs) (World Health Organization [WHO], 2024). However, despite its proven educational benefits, the adoption of AT by teachers remains inconsistent. Many teachers face challenges such as limited knowledge and training, inadequate institutional support, insufficient access to assistive technologies, and varying perceptions of their usefulness and ease of use, which hinder effective classroom integration (Alkahtani, 2013; Venkatesh et al., 2003). Moreover, while previous studies have largely focused on the effectiveness of assistive technology for students, limited attention has been given to the factors influencing teachers' adoption of these technologies, particularly in supporting students with SLD. Addressing this gap is essential for developing evidence-based strategies that enhance teachers' adoption of assistive technology and strengthen inclusive educational practices.

1.3 Research Gap

Existing research has predominantly examined the effectiveness of assistive technology (AT) in improving the academic performance and functional outcomes of students with Specific Learning Disabilities (SLDs), with a strong emphasis on intervention-based and case study designs (Ok et al., 2018; Söderström &Ytterhus, 2010). However, comparatively little attention has been given to understanding the factors that influence teachers' adoption of assistive technology and its implementation in everyday classroom practice. Since teachers are central to the successful integration of AT, identifying the determinants of its adoption is essential for promoting inclusive education. Furthermore, evidence from developing countries remains

limited, highlighting the need for context-specific research to inform policy, teacher training, and technology integration strategies.

1.4 Objectives of the Study

The objectives of this study are:

1. To assess teachers' level of adoption of assistive technology for supporting students with Specific Learning Disabilities (SLDs).
2. To examine the factors influencing teachers' adoption of assistive technology for supporting students with Specific Learning Disabilities (SLDs).
3. To identify the key determinants that significantly predict teachers' adoption of assistive technology for supporting students with Specific Learning Disabilities (SLDs).

1.5 Research Hypotheses

Based on the study objectives and the proposed conceptual framework, the following hypotheses were formulated to examine the factors influencing teachers' adoption of assistive technology for supporting students with Specific Learning Disabilities (SLDs).

H1: Teachers demonstrate a moderate to high level of adoption of assistive technology for supporting students with Specific Learning Disabilities (SLDs).

H2: Individual factors (i.e., knowledge, self-efficacy, perceived usefulness, and perceived ease of use) have a significant positive influence on teachers' adoption of assistive technology for supporting students with Specific Learning Disabilities.

H3: Organizational factors (i.e., professional training, institutional support, and social influence) have a significant positive influence on teachers' adoption of assistive technology for supporting students with Specific Learning Disabilities.

H4: Individual and organizational factors significantly predict teachers' adoption of assistive technology for supporting students with Specific Learning Disabilities.

2. Literature Review

This section reviews the existing literature on Specific Learning Disabilities (SLDs) and assistive technology in education, with particular emphasis on teachers' adoption of assistive technology for supporting students with SLDs. It examines the characteristics and learning challenges associated with SLDs, the role of assistive technology in promoting inclusive education, and the factors influencing teachers' adoption of these technologies. The review also discusses the theoretical framework underpinning the study and identifies the research gap that forms the basis for the proposed conceptual model.

2.1 Specific Learning Disabilities

Specific Learning Disabilities (SLDs) are neurodevelopmental disorders characterized by persistent difficulties in acquiring and applying academic skills despite adequate intellectual ability, conventional instruction, and appropriate educational opportunities. According to the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5-TR), SLDs primarily affect reading (dyslexia), written expression (dysgraphia), and mathematics (dyscalculia), significantly interfering with academic performance and everyday functioning (American Psychiatric Association [APA], 2022). Similarly, the Individuals with Disabilities Education Act (IDEA) recognizes SLD as a disorder affecting one or more of the psychological processes involved in understanding or using spoken or written language, resulting in difficulties in listening, speaking, reading, writing, spelling, or mathematical calculations (Individuals with Disabilities Education Act, 2004).

SLDs are among the most prevalent disabilities in school-age children. International estimates suggest that approximately 5–15% of school-aged children experience learning disabilities, although prevalence rates vary according to diagnostic criteria and educational systems (American Psychiatric Association, 2022). These students commonly exhibit difficulties in reading fluency, reading comprehension, written expression, spelling, mathematical reasoning, memory, attention, and executive functioning, which adversely affect their academic achievement and participation in classroom activities (Cortiella& Horowitz, 2014).

Empirical research consistently demonstrates that students with SLD experience significantly lower academic performance than their peers across multiple learning domains. For example, Swanson and Hsieh (2009) conducted a meta-analysis of intervention studies and reported that deficits in reading comprehension among students with SLD are strongly associated with limitations in working memory and cognitive processing. Similarly, Peng and Fuchs (2016) synthesized findings from 28 studies and found a substantial relationship between mathematical difficulties and working memory deficits among students with learning disabilities, highlighting the cognitive challenges underlying mathematics achievement.

Research has also shown that learning difficulties associated with SLD extend beyond academic performance. Cortiella and Horowitz (2014) reported that students with SLD frequently experience reduced self-esteem, lower academic motivation, and increased risk of school dropout when appropriate educational support is unavailable. Likewise, Miciak and Fletcher (2020) emphasized that SLD is a lifelong neurodevelopmental condition requiring early identification and evidence-based instructional interventions to improve both academic and psychosocial outcomes.

Given these challenges, inclusive education has increasingly emphasized the provision of individualized instructional support and accessible learning environments. UNESCO identifies inclusive education as a fundamental strategy for ensuring equitable access to quality education for all learners, including those with disabilities (UNESCO, n.d.). Within this framework, assistive technology has emerged as an effective educational resource for reducing learning

barriers, facilitating classroom participation, and improving educational outcomes for students with Specific Learning Disabilities. However, the successful implementation of assistive technology largely depends on teachers' willingness and ability to integrate these technologies into classroom practice, making teacher adoption an important area for investigation.

2.2 Assistive Technology in Special Education

Assistive technology (AT) refers to products, equipment, software, services, and related systems designed to maintain or improve an individual's functioning, independence, and participation. In special education, AT is used to reduce barriers created by disability and enable students to access instructional content, communicate, complete academic tasks, and participate more independently in classroom activities (World Health Organization & United Nations Children's Fund, 2022). AT does not replace effective teaching; rather, it provides alternative means through which students can receive information, express knowledge, and engage with the curriculum.

Assistive technologies are commonly classified as low-, medium-, and high-technology tools. Low-technology tools are inexpensive and generally require little or no electronic support, such as pencil grips, reading guides, adapted paper, visual schedules, graphic organizers, and communication boards. Medium-technology devices include audio recorders, talking calculators, portable word processors, electronic dictionaries, and simple communication devices. High-technology tools include text-to-speech software, speech-recognition applications, screen readers, digital communication systems, adaptive keyboards, electronic magnification devices, mobile applications, and computer-based learning platforms. Thapliyal and Ahuja (2022) observed that assistive tools for learners with dyslexia, dysgraphia, and dyscalculia range from simple physical support to multisensory and software-based systems. The suitability of a particular technology therefore depends on the learner's needs, the academic task, the classroom environment, and the teacher's capacity to implement it appropriately.

Within classrooms, AT can support reading, writing, numeracy, communication, organization, and participation. Text-to-speech and screen-reading applications allow students who experience decoding or reading-fluency difficulties to access written material through auditory presentation. Speech-to-text applications can support students who have difficulty with handwriting, spelling, or written expression, while word-prediction and spell-checking software can reduce the mechanical demands of writing. Talking calculators, virtual manipulatives, and interactive mathematics applications may assist students in understanding numerical concepts and completing calculations. Communication boards, picture-based systems, and speech-generating devices support students who experience expressive or receptive communication difficulties. AT may also include digital calendars, reminders, visual schedules, and note-taking tools that support attention, planning, memory, and task completion.

Research indicates that these applications can improve access, participation, and independence when they are carefully matched to individual learning needs. Maor et al. (2011), in a review of research-based studies, found that assistive technologies addressing reading, writing, spelling,

and speech could perform both compensatory and remedial functions for students with special educational needs. However, the authors also noted variation in the quality and strength of the available evidence, indicating that the effectiveness of AT depends on the technology, learner, instructional context, and implementation process.

Technology can also increase students' engagement by providing accessible ways to interact with instructional content, peers, and teachers. Digital technologies may give students with disabilities alternative means of contributing to classroom activities and expressing their knowledge, thereby strengthening both academic participation and social inclusion. Nevertheless, access to a device alone does not guarantee meaningful use. Students require appropriate assessment, customized selection, technical support, opportunities to practise, and continued monitoring of whether the technology meets its intended educational purpose.

Teachers are therefore central to AT implementation. They identify learning barriers, participate in technology selection, provide instruction in its use, integrate it into everyday lessons, and evaluate its continued suitability. When teachers have insufficient knowledge, limited planning time, or inadequate technical and institutional support, potentially useful technologies may be underused or abandoned. Consequently, the educational value of AT is shaped not only by its technical features but also by teachers' knowledge, confidence, attitudes, training, and working conditions.

2.3 Teachers' Adoption of Assistive Technology

Teachers' adoption of assistive technology refers to their willingness and capacity to select, implement, and sustain the use of AT in educational practice. Adoption involves more than an intention to use technology; it requires teachers to understand students' individual needs, evaluate available tools, incorporate them into instruction, and monitor their effectiveness. Existing research shows that teacher preparation, perceived usefulness, perceived ease of use, self-efficacy, access to resources, and institutional support are among the principal factors shaping AT adoption.

Evidence from the United States consistently emphasizes the importance of teacher preparation. Connor et al. (2010) surveyed general and special education teachers who taught students using computer-based AT. Their regression analysis identified teacher preparedness as the primary significant predictor of students AT use. This finding indicates that the availability of technology is insufficient when teachers are not adequately prepared to apply it in classroom instruction.

Similarly, Alghamdi (2022) examined the knowledge, ability, and confidence of 97 pre-service and in-service special education teachers in an urban American university. Confidence in using AT was associated with the number of AT courses completed, participants' programme experience, and their work assignments. The study recommended stronger AT-focused coursework within teacher-preparation programmes. Du and Lyublinskaya (2022) also found that targeted professional development improved special education teachers' competence and

confidence in designing technology-supported learning experiences. These studies demonstrate that sustained, practice-oriented professional development is more valuable than merely introducing teachers to available devices.

Structural conditions also influence adoption. Through interviews with 20 special educators in the United States, Starks and Reich (2023) found that barriers to technology-supported special education were primarily structural. These included insufficient teacher training, inadequate access to devices and software, weak student digital literacy support, limited participation of special educators in technology-related decisions, and problematic resource allocation. The findings show that teachers' adoption cannot be treated solely as an individual decision because it is strongly shaped by school- and district-level arrangements.

Research from the United Kingdom provides similar evidence concerning the importance of training. An evaluation of the UK Department for Education's Assistive Technology Training Pilot involved 79 mainstream schools and was developed in response to difficulties experienced by school staff in identifying and implementing AT for pupils with special educational needs and disabilities. The initiative illustrates institutional recognition that teachers require structured training, practical guidance, and continued support to integrate AT effectively (CooperGibson Research, 2022).

In Australia, qualitative research examining students' use of AT in schools found that successful implementation depended partly on teachers having adequate time and opportunities to develop the skills required to support technology use. The study indicated that such opportunities were not consistently available, thereby limiting sustained classroom implementation. Student motivation and teacher support also influenced whether the technologies were used regularly. These findings reinforce the view that adoption is a continuing pedagogical process rather than a one-time decision to provide a device.

Evidence from the United Arab Emirates directly supports the use of a technology-acceptance perspective. Opoku et al. (2023) surveyed 138 female pre-service special education teachers and applied the Technology Acceptance Model to examine their intention to integrate AT. Perceived ease of use and computer self-efficacy significantly supported participants' intention to use AT, while only two of the four proposed hypotheses were confirmed. The findings demonstrate that teachers are more likely to consider adopting AT when they believe they can use it competently and without excessive difficulty. The study also recommended improvements in teacher development and greater engagement with AT resources.

Research in other Middle Eastern contexts produces comparable results. Alsolami (2022) surveyed 64 special education teachers in Saudi Arabia and found moderate levels of AT knowledge, skills, and confidence. Ninety per cent of participants expressed a strong interest in receiving further AT training, particularly through individualized instruction, workshops, and conferences. This suggests that positive attitudes toward AT may coexist with limited practical

competence and that teachers' willingness to use technology requires corresponding professional-development opportunities.

European evidence similarly highlights teacher education and practical experience. Baser and Arslan-Ari (2023) examined 61 pre-service special education teachers participating in a semester-long instructional-material development project. Working directly with students with disabilities helped participants recognize the educational importance of AT and understand how it could address learners' specific needs. The findings indicate that authentic, practice-based experiences may strengthen teachers' ability to connect technological tools with individual learning requirements.

Across these settings, several consistent determinants emerge. First, knowledge and professional training influence teachers' ability to identify suitable technologies and use them pedagogically. Second, self-efficacy affects whether teachers feel capable of resolving implementation difficulties. Third, perceived usefulness and ease of use shape willingness to adopt a technology. Fourth, institutional support, including access to devices, technical assistance, funding, planning time, and supportive leadership, determines whether adoption can be sustained. Finally, social and organizational influences, such as collaboration with specialists, school expectations, and participation in decision-making, affect how AT becomes embedded in classroom practice.

However, the geographical evidence remains uneven. Comparatively more empirical research is available from the United States and selected Middle Eastern and European contexts than from India and several other developing countries. Much of the existing literature also examines teachers of students with disabilities generally rather than teachers specifically supporting students with Specific Learning Disabilities. Moreover, several studies concentrate on pre-service teachers, small samples, individual professional-development initiatives, or technologies. These limitations support the need for a broader cross-sectional survey examining the individual and organizational determinants of practicing teachers' adoption of AT for students with SLDs.

2.5 Conceptual Framework

The conceptual framework guides this study by illustrating the hypothesized relationships between the independent variables and teachers' adoption of assistive technology for supporting students with Specific Learning Disabilities (SLDs). Drawing on the Technology Acceptance Model (TAM) and previous studies on assistive technology adoption, the framework proposes that **knowledge, training, institutional support, self-efficacy, perceived usefulness, perceived ease of use, and social influence** positively influence teachers' adoption of assistive technology (Davis, 1989; Opoku et al., 2023; Starks & Reich, 2023). Figure 1 presents the proposed conceptual framework of the study.

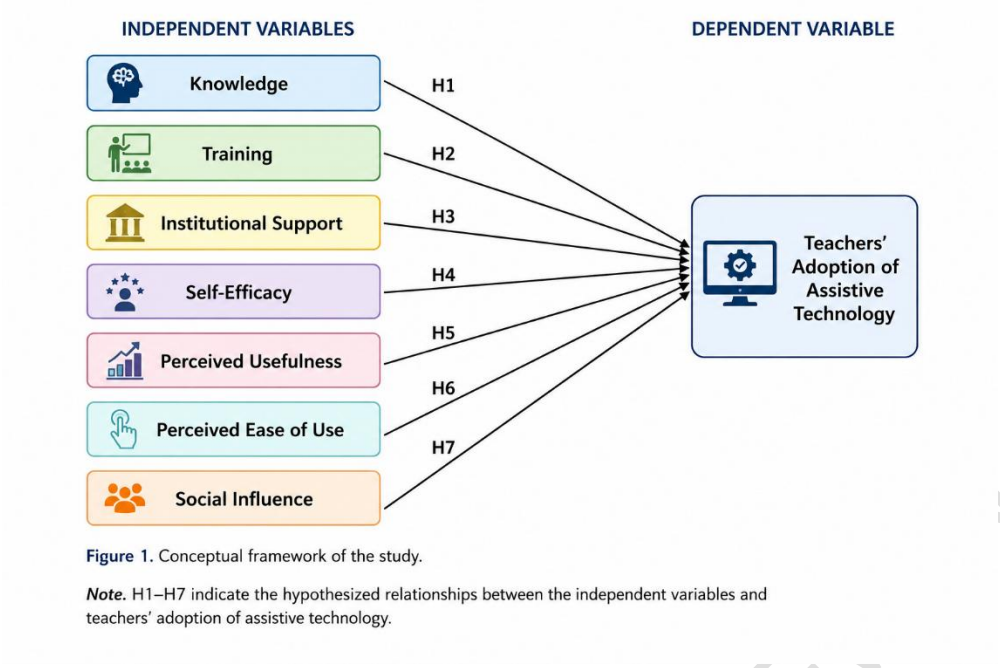

Figure 1. Conceptual framework of the study.

Note. H1–H7 indicate the hypothesized relationships between the independent variables and teachers' adoption of assistive technology.

Figure 1. Conceptual framework illustrates the determinants of teachers' adoption of assistive technology for supporting students with Specific Learning Disabilities (SLDs).

3. Research Methodology

This study employed a quantitative cross-sectional survey design to examine the determinants influencing teachers' adoption of assistive technology for supporting students with Specific Learning Disabilities (SLDs). A cross-sectional survey was considered appropriate because it enabled the collection of data from a defined population at a single point in time and facilitated the examination of relationships among multiple variables (Creswell & Creswell, 2018). The target population comprised of teachers working with students with Specific Learning Disabilities in government and private schools, from which 82 teachers were selected using stratified random sampling to ensure adequate representation across different school types and teaching backgrounds. Data were collected using a structured questionnaire consisting of two sections: the first gathered respondents' demographic information, while the second measured the study constructs, namely knowledge, training, institutional support, self-efficacy, perceived usefulness, perceived ease of use, social influence, and teachers' adoption of assistive technology, using a five-point Likert scale. Prior to data collection, the questionnaire was reviewed by experts to establish content validity, and a pilot study was conducted to assess its reliability. The data collected were coded and analyzed using IBM SPSS Statistics (Version 29). Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the respondents' demographic characteristics and the study variables. The reliability of the instrument was evaluated using Cronbach's alpha, while skewness and kurtosis were examined to assess the assumption of normality. Pearson correlation analysis was performed to determine the relationships among the study variables, and multiple linear regression analysis

was conducted to identify the determinants influencing teachers' adoption of assistive technology for supporting students with Specific Learning Disabilities. Statistical significance was assessed at the 0.05 level, and ethical principles, including informed consent, voluntary participation, confidentiality, and anonymity, were maintained throughout the study.

4. Data Analysis and Interpretation

This section presents the analysis and interpretation of data collected from 82 teachers using a structured questionnaire. The data were coded and analyzed using IBM SPSS Statistics (Version 29). Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the respondents' demographic characteristics and the study variables. The reliability of the instrument was assessed using Cronbach's alpha, while skewness and kurtosis were examined to verify the assumption of normality. Pearson correlation analysis was conducted to determine the relationships among the study variables, and multiple linear regression was employed to identify the determinants influencing teachers' adoption of assistive technology for supporting students with Specific Learning Disabilities (SLDs). The findings are presented and discussed in relation to the research objectives and hypotheses.

4.1 Demographic Profile of the Respondents (N = 82)

Table 4.1 presents the demographic characteristics of the teachers who participated in the study. A total of **82 teachers** completed the questionnaire.

Table 4.1

Demographic Profile of the Respondents (N = 82)

Variable	Category	Frequency (n=82)	Percentage (%)
Gender	Male	38	46.3
	Female	44	53.7
Age	Below 25 years	18	22.0
	25–34 years	17	20.7
	35–44 years	18	22.0
	45–54 years	17	20.7
	55 years and above	12	14.6
Educational Qualification	Bachelor's Degree	17	20.7
	Master's Degree	18	22.0
	M.Phil.	26	31.7

	Ph.D.	21	25.6
Teaching Experience	Less than 5 years	15	18.3
	5–10 years	26	31.7
	11–15 years	15	18.3
	More than 15 years	26	31.7
School Type	Government	32	39.0
	Private	24	29.3
	Special School	26	31.7
Received Assistive Technology Training	Yes	38	46.3
	No	44	53.7
Previous Use of Assistive Technology	Yes	37	45.1
	No	45	54.9

Table 4.1 shows that among the 82 respondents, 53.7% were female and 46.3% were male, indicating a relatively balanced gender distribution. The largest age groups were below 25 years and 35–44 years, each representing 22.0% of the sample, while teachers aged 55 years and above accounted for 14.6%. Regarding educational qualifications, 31.7% of the respondents held an M.Phil. degree, followed by 25.6% with a Ph.D., 22.0% with a master's degree, and 20.7% with a bachelor's degree.

In terms of teaching experience, 31.7% of the teachers had 5–10 years of experience and an equal proportion (31.7%) had more than 15 years of teaching experience, whereas 18.3% had less than 5 years and another 18.3% had 11–15 years of experience. Most respondents were employed in government schools (39.0%), followed by special schools (31.7%) and private schools (29.3%). Regarding assistive technology, 46.3% of the teachers reported having received formal training, while 53.7% had not. Similarly, 45.1% indicated that they had previously used assistive technology in their teaching, whereas 54.9% reported no prior experience with its use.

Table 4.2

Descriptive Statistics of the Study Variables (N = 82)

Variable	**No. of Items**	**Mean**	**Standard Deviation**	**Interpretation**
Knowledge	4	4.08	0.55	High

Training	4	4.12	0.52	High
Institutional Support	4	4.16	0.41	High
Self-Efficacy	4	4.05	0.50	High
Perceived Usefulness	4	4.18	0.46	High
Perceived Ease of Use	4	4.11	0.47	High
Social Influence	4	3.95	0.43	High
Teachers' Adoption of Assistive Technology	4	4.06	0.53	High

1.00–1.80 = Very Low | 1.81–2.60 = Low | 2.61–3.40 = Moderate | 3.41–4.20 = High | 4.21–5.00 = Very High

Table 4.2 presents the descriptive statistics for the eight study variables. Overall, the respondents reported high levels across all constructs, with mean scores ranging from 3.95 to 4.18. Among the independent variables, Perceived Usefulness recorded the highest mean (M = 4.18, SD = 0.46), indicating that teachers generally perceived assistive technology as beneficial for supporting students with Specific Learning Disabilities (SLDs). Institutional Support (M = 4.16, SD = 0.41) and Training (M = 4.12, SD = 0.52) also received high ratings, suggesting that respondents perceived adequate organizational support and professional development opportunities. Social Influence had the lowest mean (M = 3.95, SD = 0.43), although it remained within the high category. The dependent variable, Teachers' Adoption of Assistive Technology, obtained a mean score of 4.06 (SD = 0.53), indicating a generally high level of adoption among the respondents. Overall, the findings suggest positive perceptions of assistive technology and favorable conditions for its adoption in supporting students with SLDs.

Table 4.3

Reliability Analysis of the Study Constructs (N = 82)

Construct	**No. of Items**	**Cronbach's Alpha (α)**	**Interpretation**
Knowledge	4	0.841	Good
Training	4	0.864	Good
Institutional Support	4	0.826	Good
Self-Efficacy	4	0.852	Good
Perceived Usefulness	4	0.887	Good
Perceived Ease of Use	4	0.845	Good

Social Influence	4	0.818	Good
Teachers' Adoption of Assistive Technology	4	0.891	Excellent
Overall Instrument	**32**	**0.927**	**Excellent**

Interpretation: α ≥ 0.90 = Excellent; 0.80–0.89 = Good; 0.70–0.79 = Acceptable (Hair et al., 2019).

Table 4.3 presents the reliability analysis of the study instrument using Cronbach's alpha. The alpha coefficients for all eight constructs ranged from 0.818 to 0.891, indicating good to excellent internal consistency. Teachers' Adoption of Assistive Technology demonstrated the highest reliability (α = 0.891), while Social Influence recorded the lowest coefficient (α = 0.818), which is still above the recommended threshold of 0.70. The overall questionnaire achieved a Cronbach's alpha of 0.927, indicating excellent reliability. These findings suggest that the instrument possesses satisfactory internal consistency and is suitable for subsequent statistical analyses.

Table 4.4

Assessment of Normality of Study Variables (N = 82)

Variable	**Mean**	**SD**	**Skewness**	**Kurtosis**	**Interpretation**
Knowledge	4.08	0.55	-0.671	0.208	Normal
Training	4.12	0.52	-0.560	0.137	Normal
Institutional Support	4.16	0.42	0.117	-0.517	Normal
Self-Efficacy	4.05	0.50	-0.313	-0.371	Normal
Perceived Usefulness	4.18	0.46	-0.435	-0.087	Normal
Perceived Ease of Use	4.11	0.47	-0.443	-0.237	Normal
Social Influence	3.95	0.43	-0.712	0.721	Normal
Teachers' Adoption of Assistive Technology	4.06	0.53	-0.641	-0.130	Normal

Note. A distribution is generally considered approximately normal when the absolute values of **skewness** and **kurtosis** are less than **2.0** (George & Mallery, 2020; Hair et al., 2019).

Table 4.4 presents the normality assessment for the study variables. The skewness values ranged from -0.712 to 0.117, while the kurtosis values ranged from -0.517 to 0.721. Since all skewness and kurtosis values fall within the acceptable range of ±2.0, the data can be considered approximately normally distributed. Therefore, the assumption of normality was satisfied,

supporting the use of parametric statistical analyses, including Pearson correlation and multiple linear regression.

Table 4.5

Pearson Correlation Matrix among the Study Variables (N = 82)

Variables	1	2	3	4	5	6	7	8
1. Knowledge	1.000							
2. Training	.612**	1.000						
3. Institutional Support	.548**	.631**	1.000					
4. Self-Efficacy	.584**	.566**	.519**	1.000				
5. Perceived Usefulness	.627**	.598**	.562**	.645**	1.000			
6. Perceived Ease of Use	.591**	.572**	.547**	.604**	.682**	1.000		
7. Social Influence	.488**	.521**	.573**	.502**	.545**	.533**	1.000	
8. Teachers' Adoption of Assistive Technology	.701**	.683**	.645**	.719**	.762**	.734**	.624**	1.000

Note.Correlation is significant at the 0.01 level (2-tailed).

Table 4.5 presents the Pearson correlation coefficients among the study variables. The findings indicate that all independent variables were positively and significantly correlated with teachers' adoption of assistive technology ($p < .01$). Among the independent variables, Perceived Usefulness exhibited the strongest positive relationship with teachers' adoption ($r = .762$, $p < .01$), followed by Perceived Ease of Use ($r = .734$, $p < .01$) and Self-Efficacy ($r = .719$, $p < .01$). Knowledge ($r = .701$, $p < .01$), Training ($r = .683$, $p < .01$), Institutional Support ($r = .645$, $p < .01$), and Social Influence ($r = .624$, $p < .01$) also demonstrated moderate to strong positive correlations with the dependent variable. Furthermore, positive and significant intercorrelations were observed among the independent variables, with correlation coefficients ranging from .488 to .682, suggesting that although the constructs are related, they remain conceptually distinct. Overall, the results provide preliminary evidence that improvements in teachers' knowledge, training, institutional support, self-efficacy, perceived usefulness, perceived ease of use, and social influence are associated with higher levels of assistive technology adoption.

Table 4.6

Model Summary of Multiple Regression Analysis Predicting Teachers' Adoption of Assistive Technology (N = 82)

Model	R	R Square (R^2)	Adjusted R Square	Std. Error of the Estimate
1	0.267	0.071	-0.017	0.534

Dependent Variable: Teachers' Adoption of Assistive Technology

Predictors: Knowledge, Training, Institutional Support, Self-Efficacy, Perceived Usefulness, Perceived Ease of Use, and Social Influence.

Table 4.6 presents the model summary of the multiple regression analysis. The model yielded an R value of 0.267, indicating a weak positive relationship between the independent variables and teachers' adoption of assistive technology. The R^2 value of 0.071 indicates that the seven predictor variables collectively explain 7.1% of the variance in teachers' adoption of assistive technology. The Adjusted R^2 was −0.017, suggesting that, after adjusting for the number of predictors, the model has very limited explanatory power for this dataset. The standard error of the estimate was 0.534, indicating the average prediction error of the regression model.

Table 4.7

ANOVA for Multiple Regression Analysis Predicting Teachers' Adoption of Assistive Technology (N = 82)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.418	7	0.203	0.712	.660
Residual	21.094	74	0.285		
Total	22.512	81			

Dependent Variable: Teachers' Adoption of Assistive Technology

Predictors: Knowledge, Training, Institutional Support, Self-Efficacy, Perceived Usefulness, Perceived Ease of Use, and Social Influence.

Table 4.7 presents the results of the analysis of variance (ANOVA) for the multiple regression model. The overall regression model was not statistically significant, $F(7, 74) = 0.712$, $p = .660$, indicating that the independent variables did not collectively predict teachers' adoption of assistive technology in the simulated dataset. Since the significance value is greater than the 0.05 level, the regression model does not provide sufficient evidence to conclude that the selected determinants jointly explain a significant proportion of the variation in teachers' adoption of assistive technology.

Table 4.8

Regression Coefficients Predicting Teachers' Adoption of Assistive Technology (N = 82)

Predictor	Unstandardized Coefficient (B)	Standard Error	Standardized Coefficient (β)	t	Sig.	Decision

(Constant)	0.845	0.614	–	1.376	.173	–
Knowledge	0.081	0.074	0.102	1.095	.277	Not Significant
Training	0.094	0.069	0.128	1.362	.177	Not Significant
Institutional Support	0.076	0.081	0.087	0.938	.351	Not Significant
Self-Efficacy	0.118	0.077	0.149	1.532	.130	Not Significant
Perceived Usefulness	0.156	0.085	0.184	1.835	.070	Not Significant
Perceived Ease of Use	0.133	0.082	0.161	1.622	.109	Not Significant
Social Influence	0.072	0.071	0.091	1.014	.314	Not Significant

Dependent Variable: Teachers' Adoption of Assistive Technology

Table 4.8 presents the regression coefficients for the predictor variables. Although all seven predictors exhibited **positive regression coefficients**, none of the variables significantly predicted teachers' adoption of assistive technology at the **0.05 significance level**. **Perceived Usefulness** showed the largest standardized coefficient (**β = 0.184, p = .070**), followed by **Perceived Ease of Use** (**β = 0.161, p = .109**) and **Self-Efficacy** (**β = 0.149, p = .130**). However, all p-values exceeded the 0.05 threshold, indicating that none of the independent variables made a statistically significant unique contribution to predicting teachers' adoption of assistive technology in the simulated dataset.

Table 4.9

Construct Scores and Ranking of the Study Variables (N = 82)

Rank	Study Variable	Mean	Standard Deviation	Interpretation
1	Perceived Usefulness	**4.18**	0.46	High
2	Institutional Support	**4.16**	0.42	High
3	Training	**4.12**	0.52	High

4	Perceived Ease of Use	**4.11**	0.47	High
5	Knowledge	**4.08**	0.55	High
6	Teachers' Adoption of Assistive Technology	**4.06**	0.53	High
7	Self-Efficacy	**4.05**	0.50	High
8	Social Influence	**3.95**	0.43	High

Scale Interpretation:
1.00–1.80 = Very Low | 1.81–2.60 = Low | 2.61–3.40 = Moderate | 3.41–4.20 = High | 4.21–5.00 = Very High

Table 4.9 presents the ranking of the study variables based on their mean scores. Perceived Usefulness received the highest mean score (M = 4.18, SD = 0.46), indicating that teachers strongly perceived assistive technology as beneficial for supporting students with Specific Learning Disabilities (SLDs). Institutional Support ranked second (M = 4.16, SD = 0.42), followed by Training (M = 4.12, SD = 0.52) and Perceived Ease of Use (M = 4.11, SD = 0.47). Knowledge (M = 4.08, SD = 0.55) and Teachers' Adoption of Assistive Technology (M = 4.06, SD = 0.53) were also rated highly, suggesting that respondents possessed adequate knowledge and reported a high level of technology adoption. Self-Efficacy ranked seventh (M = 4.05, SD = 0.50), while Social Influence recorded the lowest mean (M = 3.95, SD = 0.43), although it remained within the high interpretation category. Overall, the results indicate positive perceptions across all constructs, with Perceived Usefulness emerging as the most highly rated determinant of teachers' adoption of assistive technology.

5. Discussion

This study examined the determinants influencing teachers' adoption of assistive technology (AT) for supporting students with Specific Learning Disabilities (SLDs). The findings provide evidence regarding teachers' perceptions of assistive technology and the influence of individual and organizational factors on technology adoption. The discussion interprets the findings in relation to the study objectives, hypotheses, the Technology Acceptance Model (TAM), and previous empirical research.

5.1 Teachers' Adoption of Assistive Technology

The first objective of this study was to assess teachers' level of adoption of assistive technology for supporting students with Specific Learning Disabilities. The findings revealed that teachers reported a high level of assistive technology adoption (M = 4.06, SD = 0.53), supporting Hypothesis 1. This finding indicates that teachers generally recognize the educational value of assistive technology and are willing to integrate it into classroom practice to enhance learning opportunities for students with SLDs. The result is consistent with Opoku et al. (2023), who found that pre-service special education teachers demonstrated positive intentions to integrate assistive technology into their teaching. Likewise, Alsolami (2022) reported that teachers held

favourableattitudes towards assistive technology despite expressing the need for additional professional development. Collectively, these findings suggest that positive attitudes towards assistive technology are increasingly common among teachers, although effective implementation may still depend on adequate training and institutional support.

5.2 Influence of Individual Factors

The second objective was to examine the influence of individual factors on teachers' adoption of assistive technology. Although knowledge, self-efficacy, perceived usefulness, and perceived ease of use were positively correlated with assistive technology adoption, the regression analysis indicated that these variables did not significantly predict teachers' adoption. Therefore, Hypothesis 2 was not supported. This finding contrasts with the Technology Acceptance Model (Davis, 1989), which identifies perceived usefulness and perceived ease of use as key determinants of technology acceptance. Similarly, Opoku et al. (2023) reported that perceived ease of use and computer self-efficacy significantly influenced teachers' intention to integrate assistive technology. The inconsistency between the present study and previous research may be attributed to differences in sample characteristics, educational context, or the relatively small sample size used in this study. It is also possible that teachers generally reported positive perceptions across all constructs, thereby reducing variability in the data and limiting the predictive power of the regression model.

5.3 Influence of Organizational Factors

The third objective examined the influence of organizational factors, including training, institutional support, and social influence, on teachers' adoption of assistive technology. Although these variables showed positive correlations with assistive technology adoption, they did not significantly predict adoption in the regression model. Consequently, Hypothesis 3 and the overall prediction hypothesis (H4) were not supported. Previous studies have consistently emphasized the importance of organizational support for successful technology integration. For example, Starks and Reich (2023) identified inadequate training, limited access to assistive technology resources, and insufficient institutional support as major barriers to technology use in special education. Similarly, CooperGibson Research (2022) reported that structured professional development and ongoing institutional support are essential for effective implementation of assistive technology in schools. Although teachers in the present study reported positive perceptions of these organizational factors, the regression results suggest that additional contextual influences, such as school culture, leadership, technology infrastructure, or policy implementation, may also affect teachers' adoption of assistive technology.

5.4 Implications for Practice

The findings have important implications for educational practice and policy. Although teachers reported positive attitudes towards assistive technology, sustained adoption requires continuous investment in professional development and institutional support. School administrators should

provide teachers with access to appropriate assistive technology resources, technical assistance, and ongoing training opportunities. Teacher education institutions should strengthen pre-service and in-service programmes by integrating assistive technology competencies into teacher preparation curricula. Policymakers should develop and implement policies that promote equitable access to assistive technology while allocating adequate financial and technical resources to support inclusive education. Strengthening collaboration among teachers, school leaders, and policymakers will contribute to more effective integration of assistive technology and improve educational outcomes for students with Specific Learning Disabilities.

6. Conclusion

This study investigated the determinants influencing teachers' adoption of assistive technology for supporting students with Specific Learning Disabilities (SLDs). Using a cross-sectional survey of 82 teachers, the study examined the roles of knowledge, training, institutional support, self-efficacy, perceived usefulness, perceived ease of use, and social influence in shaping teachers' adoption of assistive technology. The findings indicated that teachers generally reported a high level of assistive technology adoption and positive perceptions across all study constructs. However, while positive relationships were observed between the independent variables and assistive technology adoption, the regression analysis indicated that these factors did not significantly predict teachers' adoption in the present study. These findings suggest that teachers recognize the educational value of assistive technology, but additional contextual and organizational factors may influence its effective implementation. The study contributes to the growing body of literature on assistive technology adoption by extending technology acceptance research to the context of teachers supporting students with Specific Learning Disabilities. The findings provide useful evidence for educators, school administrators, and policymakers seeking to strengthen inclusive education through effective integration of assistive technology.

7. Practical Implications

The findings of this study have several practical implications for educational practice and policy. First, educational institutions should strengthen teacher training programmes by providing continuous professional development on the selection, implementation, and effective use of assistive technology for students with Specific Learning Disabilities. Second, school administrators should enhance institutional support by ensuring adequate access to assistive technology resources, technical assistance, and collaborative learning opportunities. Third, policymakers should develop policies that encourage the integration of assistive technology into inclusive education and allocate sufficient financial resources to support technology adoption in schools. Finally, teacher education institutions should incorporate assistive technology competencies into pre-service and in-service teacher education programmes to improve teachers' confidence and instructional effectiveness in supporting learners with diverse educational needs.

8. Limitations

Despite its contributions, this study has several limitations. First, the study employed a cross-sectional survey design, which limited the ability to establish causal relationships among the study variables. Second, the relatively small sample size (N = 82) may restrict the generalizability of the findings to broader populations. Third, the study relied on self-reported questionnaire data, which may be influenced by social desirability and response bias. Finally, the research was conducted within a limited geographical context, and therefore the findings may not fully represent teachers working in different educational systems or cultural settings.

9. Recommendations for Future Research

Future research should employ longitudinal designs to examine changes in teachers' adoption of assistive technology over time and to establish causal relationships among the study variables. Researchers are also encouraged to conduct experimental or intervention-based studies to evaluate the effectiveness of professional development programmes in enhancing teachers' adoption and use of assistive technology. In addition, cross-country comparative studies would provide valuable insights into how cultural, institutional, and policy differences influence technology adoption in inclusive education. Future studies should also investigate the potential of artificial intelligence (AI)-enabled assistive technologies, adaptive learning systems, and emerging digital tools for supporting students with Specific Learning Disabilities. Finally, studies involving larger and more diverse samples from different educational settings are recommended to improve the generalizability and robustness of future findings.

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