

**The perspectives of elementary school
educators in Saudi Arabia regarding the
utilization of advanced assistive technology for
students with learning disabilities**

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The perspectives of elementary school educators in Saudi Arabia regarding the utilization of advanced assistive technology for students with learning disabilities

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Abstract

The purpose of the research was to investigate elementary school teachers' knowledge, skills and perceptions toward using high-tech assistive technology (AT) for students with learning disabilities in Saudi Arabia. A quantitative approach was adopted in this investigation. A sample of 264 teachers who participated in an online survey was used in this study. SPSS version 25 software was used for data analysis, which included descriptive statistics and Analysis of Variance. The results showed that teachers' self-reported perceptions of high-tech AT are significant predictors of teachers' knowledge and skills related to high-tech AT use. The research is significant as it provides a unique contribution to the existing literature on high-tech AT use in relation to elementary teacher perceptions, knowledge and skills in Saudi Arabia.

Key words: High-tech Assistive technology, Learning Disabilities, Special Education, instruction, inclusive, learners.

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Introduction

Saudi Arabia is among the nations with a high populace of people with learning disabilities (LD), the most commonly diagnosed being dysgraphia, dyslexia, and dyscalculia. Alotaibi and Almalki's (2016a; 2016b) study revealed that the diagnosis of LD in Saudi Arabia has increased significantly. Learning and teaching of students with LD is an education area which is attracting an international concern. Consequently, various technologies are being developed towards its efficiency and improvement (Chukwuemeka & Samaila, 2019).

A learning disability (LD) is defined as a condition that causes learning difficulties, particularly when not related to physical disability (Alnaim, 2015). The condition typically interferes with fundamental learning skills subsuming math, reading, and writing. In Saudi Arabia, the major disabilities highlighted in literature are hearing impairment, deafness, blindness, autism, Down Syndrome and intellectual disabilities (Aldabas, 2015). Students with LDs often experience problems in reading, vision and writing. It is clear that for these students to learn properly, technology support is essential.

Technology experts have developed special education technologies to improve functional abilities and encourage persons with disabilities to fully participate in education. Integrating emerging AT can potentially play a crucial role in helping learners with LD meet their education goals (Onivehu, Ohawuiro & Oyeniran, 2017). Research reveals that AT is one of the accommodations or tools to help students attain better performance (Ault et al., 2013). Adebisi, Liman, and Longpoe (2015) pointed out the significance and urgency of using AT to support students with LD.

Assistive Technology (AT) is defined as a service which includes support that directly assists a person with a disability in the assessment, selection, acquisition, and or use of an AT device (Wood, 2015). The definition includes a wide range of high-tech and low-tech devices which people could be used in an educational setting as an inclusive practice or in inclusive settings (Harris, 2013). AT may help students with LD reduce the impact of their disability. LD, in Saudi

Arabia context, refers to any condition that impacts one's capacity to acquire, store, assess, and manipulate information from learning in class (Alfaraj & Kuyini, 2014).

Nsofor and Bello (2015) classified AT into three classes, namely high, medium and low technologies. Low technologies, also referred to as low-tech, include inexpensive, simple and common tools and devices adapted to help in various difficulty areas. Examples are highlighter tape, pencil grips, and large-print books. Mid-tech devices are electronic, easy to operate, and cheap; examples include talking calculators, scanning pens, and fairly portable keyboards (Sider & Maich, 2014).

On the other hand, high-tech devices are complex, electrical, expensive, and require a lot of training before use. Also, these devices have a large capacity for individualization, including word prediction software, listening devices, and hearing aids (Nsofor & Bello, 2015). Word processors, communication devices, and speech recognition software are all types of high-tech AT devices. According to Sider and Maich (2014), the high-tech ATs prevalently used in school settings include interactive whiteboards, classroom amplification systems, and text-to-speech software.

Technology use often comes along with challenges. Special education teachers evidently experience numerous challenges when attending to distinct learning needs of the students with LDs in classrooms (Onivehu, Ohawuiro & Oyeniran, 2017). Whereas a number of students cannot read printed documents (Alharbi, 2018; Al-Moghyrah, 2017), others find it difficult to receive spoken information. Communication is a major challenge to other students experiencing mild LDs. As a result, this study sought to investigate teachers' knowledge, skills and perceptions toward using high-tech assistive technology.

Statement of the problem

With the increase in the prevalence of LD in Saudi Arabia, research investigating the contribution of technology in helping students with LD has increased. Previous scholars have described the use of AT by examining the nature of technology, beliefs, parental involvement, and student performance concerns (Almaki, 2016 a;

Watson, Ito, Smith, & Andersen, 2010). In Saudi Arabia mainstream schools, there is limited research regarding teachers' use of AT in classrooms to support students with LD (Alotaibi & Almalki, 2016a).

Research on the perceptions of teachers in relation to assistive technology use is evidently not new (Onivehu, Ohawuiro & Oyeniran, 2017). However, relatively few investigations have researched how teachers' views relate to technology use in classrooms (Wachira & Keengwe, 2012). In fact, no study has researched the perceptions of elementary school teachers towards high-tech AT use in Saudi Arabia. Thus, it is important to research how AT is used to support students with LDs by investigating teachers views concerning AT knowledge and use.

Purpose of the study

This study investigated elementary school teachers' perceptions toward using high-tech assistive technology AT to support students with learning disabilities in Saudi Arabia. Additionally, the study sought to determine if these perceptions predict their knowledge and skills.

Research question

The researcher in this study sought to answer this question, which guided the study:

To what extent do elementary teachers' perceptions of high-tech assistive technology predict their knowledge and skills related to actual usage of assistive technology for students with learning disabilities in Saudi Arabia?

Literature Review

The growing importance attached to the use of AT, and computers overall, in educating learners with disabilities to maximize their potential has received much attention over the past decade (Alkahtani, 2013; Nees & Berry, 2013; Atanga et al., 2019; Nordström, Nilsson, Gustafson, & Svensson, 2018; Sider & Maich, 2014). However, there is a need to examine the competencies related to high-tech AT use among classroom teachers in elementary school.

The education policy in Saudi Arabia targets two main groups of students for inclusion (Fakrudeen et al., 2017). The first category entails students with LD, low vision, behavioral problems, and physical disabilities who attend general education schools (Alyami et al., 2016). The second group, precisely targeted by newer education policy, is composed of students previously (and some still presently) educated in special education institutions. Alshahrani (2014) stated that the Saudi Ministry of Education policy stresses that free education is compulsory for all students, including those with disabilities.

Al-Moghyrah (2017) noted that the beliefs and attitudes held by teachers affect assistive technology development and integration into classrooms. Various investigations focused on teachers' perceptions regarding AT use have demonstrated that the perceptions teachers have significantly affect AT skills, knowledge and usage (Atanga et al., 2019; Alkahtani, 2013; Alfaraj & Kuyini, 2014; Nelson, Poole & Muñoz, 2013; Al-Moghyrah, 2017; Tamakloe & Agbenyega, 2017).

Various investigations have been performed in Saudi Arabia regarding AT use, focusing on various students with disabilities, including visual impairments, autism spectrum disorder and Down Syndrome, in inclusive schools (Alfaraj & Kuyini, 2014; Alharbi, 2018; Al-Moghyrah, 2017). Alharbi (2018) conducted an investigation on AT use among special and general education teachers of students with divergent types of disabilities. The author addressed important issues associated with teachers' attitudes, knowledge, skills and experience regarding AT use with students with disabilities.

Related literature

A study conducted by Alkahtani (2013) gathered information about AT knowledge and skills among teachers responsible for special education. Data used for this research were collected from 127 participants via a self-reporting questionnaire. Interviews were also used with three participants to gather data of greater breadth and depth than analysis of the survey data would allow.

The overall findings from Alkahtani's (2013) study indicating that most teachers lacked knowledge and skills in using AT raises a critical issue, with over 93 (73%) of the respondents reportedly poorly

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prepared or not at all prepared to provide AT services for students with disabilities in their schools. There was also concern about the teachers' attitudes toward using AT with their students. The research concluded that teachers' lack of positive attitudes toward using AT could pose a major barrier to their use of AT in their classrooms, and since over 84 teachers (66%) lacked professional development, training might influence their use of AT in the classroom.

Nelson, Poole, and Muñoz (2013) explored how often sound-field amplification and personal FM systems were used in preschool classrooms. They also examined teachers' perceptions of what were considered advantages and disadvantages of using hearing AT, and provided recommendations for teachers in using hearing AT. The researchers utilized a cross-sectional survey design, and participants were professionals who provided services to preschool-age children who were deaf or hard of hearing in public or private schools. A total of 306 surveys was sent to about 162 deaf education programs throughout the United States, and only 99 surveys (32%) were returned.

A study conducted by Tamakloe and Agbenyega (2017) examined the professional philosophies and experiences of preschool teachers and their support staff in the usage of AT in an early intervention inclusive preschool class. The study revealed that in order to effectively use AT to thrive and make a full impact on all children's learning and development, there was a need for a stronger framework that would develop inclusive values, philosophies, professional knowledge, and practice principles of preschool teachers and their support staff. Key implications of the research were many.

Al-Moghyrah (2017) study carried out in Saudi Arabia investigated teachers' perspectives regarding AT use to support students with Down syndrome. 50 teachers chosen from Riyadh were selected to engage in the research. The findings indicated that most of the teachers had positive perceptions about AT use. Overall, the teachers agreed that AT is useful in social activities and learning activities for most students with Down syndrome. However, they

reported lack of skills, resources, time and support concerning AT use.

In a recent investigation, Alharbi and Madhesh (2018) carried out a study to investigate the knowledge, skills and use of AT among special education teachers in elementary inclusive schools located in Saudi Arabia. The author used a survey to collect data from a population of 346 participants. Among other key findings, majority of the teachers reported that they did not frequently use AT with their respective students in schools.

Chukwuemeka and Samaila (2019) investigated the perceptions of teachers and factors that limit high-tech AT use in Nigerian special education schools. A descriptive survey design was adopted, and questionnaires used to obtain data from 120 participants. The study employed multi-stage sampling method. Mean, standard deviation and frequency percentages were used in analyzing the data obtained. The results pointed out that most teachers do not utilize high-tech AT when teaching students with physical disabilities. Nonetheless, the teachers perceived positively the great benefits of using high-tech AT resources.

Method

Research methodology

In this study, I developed a survey to help understand teachers' views about high-tech AT skills, knowledge and perceptions. Before administering the questionnaires, I consulted 3 specialists to make sure that the survey instrument is appropriate and sufficient. I adjusted the research design and research variables in line with the expert opinions, before administering the instrument.

A quantitative research approach was adopted in the study. According to Creswell (2014), quantitative research normally describes the core research problems and establishes an explanation of the association established between the selected variables. A cross-sectional survey research design was adopted to determine if teachers' perceptions of high-tech AT is a significant predictor of teachers' knowledge and skills of high-tech AT for students with LD in Saudi Arabia.

Instrument design

The questionnaire designed for the purposes of this research was prepared in three sections to examine respondents' opinions. The first section included demographic information, namely gender, level of education, years of teaching experience and school location. The second section included 13 items obtained from the literature regarding knowledge and skills related to the use of high-tech AT. Some categorical responses in this section were on a 4-point Likert-type scale (1= None 2= Beginner, 3= Proficient, 4= Excellent/Expert). Other responses required a yes or no answer.

The third section included 11 items designed to evaluate teachers' perceptions of high-tech AT use. Perceptions here mean the views expressed by teachers and their specific ways of acting in conjunction with technology devices and the physical environment, which is the classroom. The measurement scale used was aimed at providing fixed responses, using the Likert scale 1 (Strongly Disagree), 2 (Disagree), 3 (Agree), and 4 (Strongly Agree).

Population and sample size

Male and female elementary teachers in general and special education from a medium-sized city in Saudi Arabia, were invited to participate in this study. Purposive sampling procedures was adopted to identify and choose the potential participants and study setting. Sloven's formula was used in determining sample size, which comprised of 366 participants. Questionnaires were distributed to the participants via an online platform.

An existing survey instrument was adapted and used in this study. The survey instrument included measurement scales. The interval scale helped measure the question items of the research except for organization or demographic characteristics. The use of this scale is related to its suitability for testing the hypotheses of the research. The survey questionnaire includes 30 questions classified into four sections, and was administered using Qualtrics Survey Software.

The survey contained the Likert scale, which was the most appropriate interval scale for this study. The Likert scale had four

points such that 1= Strongly Disagree, 2= Disagree, 3= Agree, and 4= Strongly Agree. This scale allowed the respondents to respond to the survey questions and items with higher specificity (Creswell, 2017). Follow-up contact on the survey distribution was made after 2 weeks. After sending the survey, the Ministry of Education helped resend the survey to the participants through e-mail addresses as a reminder.

An invitation letter and a consent form were distributed alongside the questionnaire for the respondents to provide their permission. I explained the study objective and the research procedure to the participants, assuring them that the data obtained would be treated confidentially. The survey was first sent to the Institutional Review Board (IRB) at Concordia University to obtain approval to conduct the study in a Saudi Arabian setting. After the review and approval by the IRB, the survey was uploaded to a Qualtrics software platform.

Data processing

After survey administration, the researcher collected the responses from Qualtrics software. The data obtained were confirmed, verified, validated and entered into SPSS software for analysis. Frequency analysis, descriptive analysis, descriptive statistics analysis, reliability, regression analysis and ANOVA were carried out on the valid data collected.

Cronbach's alpha (α) was applied in this research to evaluate the reliability of the data received. For internal consistency reliability, both the correlation of items to total items and the Cronbach's alpha coefficient were used in this research. I ran the reliability analysis of each of the subscales and reported the alphas.

The reliability of the questions included in the survey indicated a satisfactory value of $\alpha = 0.762$, $\alpha = 0.800$ for teachers' perceptions of high-tech AT use and levels of knowledge and skills related to high-tech AT use constructs. The results, thus, indicate that all respondents fully understood the information which was included in the questionnaire, and were familiar with the effect of teachers' perceptions on knowledge and skills related to using high-tech AT for students with LD. Table 1 shows the reliability test outcomes.

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Table 1: Reliability Test- perceptions of high-tech AT use and levels of knowledge and skills related to high-tech AT use

Reliability Test- perceptions of high-tech AT use	
Scale Items	Data Reliability
Number of items=11 Teachers' perceptions of high-tech AT use	Cronbach's Alpha=0.762
Reliability Test- levels of knowledge and skills related to high-tech AT use	
Number of items=13 Teachers' levels of knowledge and skills related to high-tech AT use	Cronbach's Alpha=0.8000

Results and discussion

Demographic information

264 general education and special education teachers responded to the survey. Of the 264 participants, 145 (54.92%) were male and 119 (45.08%) were female. It should be noted that from the targeted 366 participants, 264 responses were obtained. This shows a 72.68% response rate, which is reliable in the analyses carried out.

The participants varied in education level: 5.30% had only a high school diploma, 66.66% had a bachelor's degree, 23.10% had a master's degree, and 4.92% had a doctoral degree. They also differed in their years of teaching experience as 27.65% of them had 5 or fewer years of experience, 28.78% of them had 6 to 10 years of experience, 43.56% had 11 or more years of experience. When asked about their education role as teachers, 52.28% of them indicated that they were general education teachers while 47.72% stated that they were special education teachers. Over half, 62.5%, of the participants indicated that they had not received any training in high-tech AT, while 37.5% had received some high-tech AT training. Finally, 14.77% of the teachers taught in rural school areas while 85.23% taught in urban school areas. Demographic data are displayed in Table 1.

Table 2: Demographic variables

	Category	Count	Percentage
Gender	Males	145	54.92%
	Females	119	45.07%
	<u>Total</u>	<u>246</u>	<u>100%</u>
Education Levels	Diploma	14	5.30%
	Bachelor	176	66.66%
	Master	61	23.10%
	Doctorate	13	4.92%
	<u>Total</u>	<u>246</u>	<u>100%</u>
Years of Teaching Experience	5 or fewer	73	27.65%
	6-10	76	28.78%
	11 or more	115	43.56%
	<u>Total</u>	<u>246</u>	<u>100%</u>
Education Role	General	138	52.28%
	Special	126	47.72%
	<u>Total</u>	<u>246</u>	<u>100%</u>
Training in Assistive Technology	No	165	62.5%
	Yes	99	37.5%
	<u>Total</u>	<u>246</u>	<u>100%</u>
School Location	Rural	39	14.77%
	Urban	225	85.23%
	<u>Total</u>	<u>264</u>	<u>100%</u>

Teachers' level of knowledge and skills

Means and standard deviations (SD) were calculated to examine the extent to which teachers self-reported their expertise in the use of high-tech AT.

For the *knowledge and skills* scale, the results of the means indicated that most of the participants' self-reported *knowledge and skills* scores ranged from the beginner to the excellent/expert (*I know the skill well enough to teach to someone else*) levels.

Regarding the overall mean scores, item four (ks_4): *I am confident in my ability to identify and operate software programs that meet students with learning disabilities' IEP goals*, indicated the highest mean score among all of the other KS items. Conversely, Item 8 (ks_8): *I am confident in my ability to identify a variety of high-tech*

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AT tools that my learning students need, indicated the lowest mean score among all other KS items.

Regarding the dispersion of the scores, Item 3 (ks_3): *I know the concepts, terms, and laws in Saudi Arabia about high-tech AT*, indicated the largest dispersion among all other KS items. On the other hand, Item 1 (ks_1): *Estimate your knowledge about high-tech AT*, indicated the smallest dispersion among all the other KS items. Table 3 shows the means and standard deviations of all KS scale items.

Table 3: Item Means and Standard Deviations (SD) of the Knowledge and Skills (ks) Scale.

Item Code	Mean	SD
ks_1	2.42	.855
ks_2	2.60	.888
ks_3	2.44	.965
ks_4	2.63	.863
ks_5	2.61	.952
ks_6	2.54	.905
ks_7	2.53	.922
ks_8	2.39	.945
ks_9	2.48	.918

For the *perceptions of high-tech assistive technology* scale, the results of the means indicated that most of the participants' perceptions scores ranged from the *agree* to *strongly agree* levels. In other words, the scores on the *perceptions of high-tech assistive technology* scale items are positive.

Regarding the overall mean scores, the highest mean score was found to be Item 2 (Per_2): *I would recommend the use of high-tech AT to my colleagues because it is more than a mere educational tool*. On the other hand, Item 6 (per_6): *I feel anxious about high-tech AT, thus I rarely use it*, indicated the lowest mean score among all other *perceptions of high-tech assistive technology* scale items.

Regarding the dispersion of the scores, Item 6 (per_6) indicated the largest dispersion among all of the other *perceptions of high-tech*

assistive technology scale items while Item 2 (per_2), indicated the smallest dispersion among all of the other *perceptions of high-tech assistive technology* scale items. Table 4 shows the means and standard deviations of all *perceptions of high-tech assistive technology* scale items).

Table 4: Item Means and Standard Deviations (SD) of the Perception Towards High-Tech Assistive Technology (per) Scale.

Item Code	Mean	SD
per_1	2.99	.836
per_2	3.47	.590
per_3	3.38	.605
per_4	3.45	.583
per_5	3.20	.632
per_6	2.14	.866
per_7	3.41	.658
per_8	3.28	.691
per_9	3.46	.685
per_10	3.07	.808
per_11	3.25	.774

Teachers' knowledge, skills and perceptions

A simple linear regression model was conducted using teachers' perceptions of high-tech assistive technology as the independent variable to predict their scores of teachers' knowledge and skills as the dependent variable.

The overall results of the regression model indicated that the perception of high-tech assistive technology is a positive significant predictor of teachers' knowledge and skills in educational environments, $\beta=.581$, $p<.001$. The results also indicated that perceptions of high-tech assistive technology explained 11.7% of the variance, $R^2=.117$, $F(1,262) = 34.709$, $p<.001$ in teachers' knowledge and skills. This means that for every one-unit increase in teachers' self-reported perceptions of high-tech assistive technology, teachers' knowledge and skills scores are expected to increase on average by .581.

Interpretation and discussion

This study presents new empirical results concerning high-tech AT usage, skills, knowledge and perceptions, and is geared towards

investigating the impact of teachers' perceptions on their knowledge and skills. The study's aim is supported by previous literature given that high-tech AT has become a crucial aspect of learning in ensuring inclusive education in Saudi Arabia.

The findings of the current study suggest that female teachers reported greater knowledge and skills regarding high-tech AT than their male counterparts. In other words, gender influences high-tech AT knowledge and skills. However, this did not align with previous research by Ogirima et al (2017) who found that teaching experience and gender did not influence teachers' attitudes or competence toward the use of high-tech AT.

The results in this research indicated that 50% of the participants' perceived *knowledge and skills* scores were in the proficient range, demonstrating their belief in their abilities and preparation for using high-tech AT with their students. The implication of this finding is that self-reported high-tech AT use proficiency is linked to higher ratings of high-tech AT knowledge and skills. Atanga et al (2019) also found that higher proficiency ratings of AT use was linked to perceptions of teacher preparation for improved AT use.

The study revealed medium level of AT integration by special education teachers. The reported proficiency of teachers indicated that 50% of teachers knew the concepts, terms, and laws in Saudi Arabia related to high-tech AT. Consequently, they were interested in using high-tech AT. In support of the finding, Onivehu, Ohawuiro, and Oyeniran (2017) established that the quality, attitude and experience of the teachers determine the extent of AT use in the classroom.

Although there was a variance, as 11.4% of teachers said they did not have knowledge of high-tech AT, 29.2% of the participants had beginner-level knowledge, and 9.5% had expert knowledge, the results suggest that 50% of the teachers reported proficient knowledge regarding the use of high-tech AT for their students. Demirok et al (2019), in support of this finding, argued that AT produces positive results. The authors revealed that the generation opinions of teachers regarding AT utilization is promising and gradually evolving.

Similarly, Al-Moghyrah (2017) study reported that the skills and knowledge of special education teachers in Saudi Arabia concerning AT use is increasing.

From the findings, it is clear that elementary teachers use high-tech AT devices frequently to teach students with LDs, and encourage collaborative learning. Collaborate learning, in this context, promotes inclusion. In addition, teachers positively perceived that high-tech ATs are highly beneficial. To corroborate the finding, Ogirima, Emilia & Juliana (2017) also established that teachers have a positive attitude towards the use of assistive technologies.

This study indicated that perceptions of high-tech AT was a positive significant predictor of teachers' knowledge and skills in educational environments. When the teachers positively perceived high-tech devices use as useful for the students with LDs, they are highly motivated to facilitate device use in classroom. Tamakloe and Agbenyega (2017) agree that AT devices create positive environments for skills improvement and interdependence among learning disability students. Flanagan and colleagues (2013) found that teachers' attitudes were a significant predictor of teachers' using AT to support students with LD.

The results suggested that perceptions of high-tech AT explained the variance in teachers' knowledge and skills. Therefore, when teachers had positive attitudes about high-tech AT, they had more AT knowledge and AT skills. Accordingly, AT usage enabled students learn at their individualized speeds. Additionally, as teachers' attitudes improve, their knowledge and skills improve as well. To support the finding, Atanga et al (2019) established that positive attitudes among teachers translated to improved knowledge and skills concerning AT use.

Conversely, when teachers had negative attitudes toward the use of AT, their knowledge and skills were lacking; when teachers' attitudes decline, their knowledge and skills will likely decline as well. Al-Moghyrah (2017) associated such decline in knowledge and skills to limited professional development concerning AT use. The authors established that teachers lacked skills concerning AT, as well as limited resources, time and support. Similarly, Alkahtani (2013)

found that lack of essential knowledge and skills linked to AT use explained negative attitudes of teachers, and their reluctance to apply AT in Saudi classrooms. Both findings suggest that more support is needed toward AT implementation.

The results of this study indicate that teachers' perspectives affect their AT knowledge and skills. This aligns with previous research. Alkahtani's (2013) study revealed that teachers' knowledge and awareness of the possible effects that AT has on most students with disabilities seems vital in the selection and adoption of AT. Similarly, in Okolo and Diedrich (2014) study, three quarters of the participants indicated that staff training is crucial to promote AT use among educators.

Regarding AT knowledge, 50% of teachers in the current study reported that they had proficient knowledge of high-tech AT. Additionally, regarding skills, 46.2% of this study's teachers stated that they had proficient skills related to high-tech AT, indicating that they were utilizing AT in their classrooms. Alkahtani (2013) emphasized on the significance of AT skills and knowledge in technology selection and implementation. Prior literature also supports this finding. Flanagan and colleagues (2013) found that teachers' attitudes are significant predictors of teachers' using AT to support students with LD.

Conclusion

The focus of this investigation was on elementary teachers' perceptions towards high-tech AT use and how their perceptions affect their knowledge and skills. Prior research has pointed out the significance of inclusion to enhance Saudi Arabia special education. This study contributes to the related literature by examining high-tech AT use in relation to teachers' knowledge, skills and perceptions based on the data collected from the population utilized. The contribution to the scientific knowledge is novel given that no previous study focused on high-tech AT use in Saudi Arabia has been conducted.

Teachers' overall reported level of knowledge and skills regarding high-tech AT use was approaching proficiency. Overall, this study indicated that teachers' self-reported positive perceptions of high-tech AT were associated with greater levels of knowledge and skills related to high-tech AT. Various suggestions have been presented to help enhance the level and frequency of high-tech AT usage and implementation in classrooms for students with LD in Saudi Arabia. The suggestions are aimed at improving the knowledge, skills, and attitudes of teachers toward high-tech AT use in classroom to support students with LD. It is vital that teachers receive professional training to increase high-tech AT usage.

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