

**INFLUENCE OF ASSISTIVE TECHNOLOGY ON EFFECTIVE
TEACHING FOR STUDENTS WITH LEARNING DISABILITY IN
UNIVERSITIES IN NORTH WEST REGION OF NIGERIA**

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Abstract

This study investigated the influence of assistive technology on effective teaching for students with learning disability in Universities in North West region of Nigeria. Two research questions guided the study. A descriptive survey designed was used for the study. The population of study was made up of 230 visually impaired respondents in Kano State and Jigawa State. The selected states were represented by 100 visually impaired respondents from Jigawa State and 130 visually impaired respondents from Kano State. Since the population was manageable, no sampling was done. The instrument used for data collection was a 42 item questionnaire developed by the researchers. The questionnaire was validated by three experts, two from the Department of Psychology and Guidance and Counseling, School of General Education, Aminu Kano College of Islamic and Legal Studies, Kano state and one from the Department of Educational Foundations, University of Nigeria, Nsukka. It was also tested for reliability using Cronbach Alpha method reliability technique and a coefficient of 0.87 was obtained. Mean and standard deviation analysis were used to answer the two research questions while t-test analysis was used to answer null hypothesis formulated for the study. The findings of the study revealed the need to select useful technology devices on effective teaching for students with learning disabilities, to enable them achieve the target goals, and instructional guides for special education teachers in the classroom, that would help students with learning disabilities benefit maximally from the use of assistive technology devices, whether in the classroom or at home. The findings of the study also revealed challenges faced by universities in the North West Region of Nigeria in using assistive

technology on effective teaching for students with learning disabilities. Based on the findings of the study, it was recommended among others that training students with learning disabilities properly using assistive technology devices will help them increase their educational gains and eliminate learning difficulties.

Keywords: Assistive technology, Teaching, Learning disabilities, Special education

Introduction

The ability to control and manage students with disability(ies) create different opinions among both families and professionals in academic learning environments. Learning disability is a disorder that inhibits the ability to process and retain information as there are numerous mental processes that affect learning (Zayyad, 2019). Learning disabilities can vary dramatically. According to Raskind (2004) posited that there are five most common learning disabilities in classrooms, which include: Dyslexia, that is a learning disorder that impedes the student's ability to read and comprehend a text; Attention Deficit/Hyperactivity Disorder which is a common learning impediment among students which makes them have difficulty paying attention and staying on task, they can be easily distracted and often have difficulty in traditional school settings; Dyscalculia that is students with dyscalculia disorders that have trouble performing basic math calculations, or difficulty with concepts like time, measurement or estimation; Dysgraphia which is a writing disability related to the physical act of writing which makes the students unable to hold a pencil correctly, and their posture may be tense while trying to write; and Processing deficits that is students with processing deficits that have trouble making sense of sensory data or deficit that makes it hard for students to perform in a traditional classroom without instructional supports (Special Education Resources, 2020).

In an attempt to find resolutions to these difficulties among the students with disability(ies) in this modern-day classroom, one of the foremost difficulties facing professionals in addressing the societal, behavioural, cognitive and sensitive needs of these students is the use of assistive technology. This is to suitably utilize, how to select assistive technology, where to get it, use it and how to assess its competence (Liman, Adebisi, Jerry & Adewale, 2015).

Assistive Technology (AT) is a derivative of Information and Communication Technology (ICT) with the history linked to computer. Johnston, Beard, & Carpenter (2007) defined AT as an item or piece of

equipment or product system either acquired commercially, off the shelf, modified, or customized and used to increase, maintain, or improve functional capability for individual with disability (ies). Zayyad (2019) defined AT as a pivotal instrument in the educational system for all students in general and for those with disabilities in particular. Mittler (2007) opined that AT is technology that increases, improves, or maintains the functional capabilities of students with disabilities. Interestingly, Rose, Hasselbring, Stahl & Zabala (2005) sees AT as equipment designed to create more independence for individuals with disability to overcome environmental barriers that may hinder their learning in the various educational settings. In this study, AT is any service that openly supports adolescents with disability in making choice, achievement, or use of an assistive relevant machinery device to improve their functional capability in the learning environments.

Interestingly, Blackhurst (2005) explores various types and designs of AT methods that have been developed and used in the educational arena to promote the learning and educational environment of students with learning disability(ies). Types of AT includes mechanical, electronic, and microprocessor-based equipment, non-mechanical and non-electronic aids, and specialized instructional materials, services, and strategies that people with disability(ies) can use to assist them in learning, make the environment more accessible, enable them to compete in the workplace, enhance their independence, and otherwise improve their quality of life. However, among these AT services Blackhurst (2005) suggests productivity tools which include computer software, hardware, and related systems that enable people to work more effectively and efficiently. For example, computer software such as database programmes which can be used to store and rapidly retrieve information; word processing programmes which can be used to easily edit text material; expert system computer programmes which can aid in decision making, such as the educational placement of students with disabilities. The use of productivity tools with Learning Disabilities students which can include specialized writing tools, such as writing organization tools, spelling checkers, speech synthesis and word prediction software, writing prompts, and multimedia composing tools (Blackhurst, 2005).

Similarly, Raskind (2004) suggested a number of useful technologies that may be helpful in assisting students with disability to overcome their difficulties, such as: word processors, spell-checking programmes, proofreading programmes, outlining (Brain Storming), speech recognition, abbreviation expanders, speech synthesis, optical character recognition systems, free-form databases, and talking calculators. Cutler (2001) concluded that spellcheckers were useful in helping students with disability compensate

for their spelling difficulties. Collins & Halverson (2009) found that the use of word processors helped in improving the writing skills of students with disability so as to help the students with learning disability use AT efficiently and overcome their difficulties.

Interestingly, Mishra, Sharma and Tripathi (2010) outline some challenges that may hinder their learning process, such as lack of specialized ICT teachers for the students with learning disability, limited flexibility in training options for children with learning disability, limited availability of specialized disabled friendly hardware and software resources in developing countries, lack of formal involvement of the government organizations and support structure for ICT for the persons with learning disability, attitude barriers towards children with disability, lack of appropriate disabled legislation and policies, their implementation, and limitation of finances. Although AT is considered as an essential component in the education of students with learning disability(ies), it is also however, a challenge for many parents, students and educators. Therefore, AT intended to facilitate psychosocial functioning, lack of resources to purchase AT equipment constitutes an environmental barrier. Scarcity of trained teachers to assist in choosing and obtaining AT devices also represents a barrier within the social environment and educational setting (Scherer & Glueckauf, 2005). Similarly, Copley and Ziviani (2004) conducted an intensive literature review on the application of AT for students with multiple disabilities and noted that the barriers were found which include: lack of appropriate staff training and support; negative staff attitudes; inadequate assessment and planning processes; insufficient funding; difficulties procuring and managing equipment; time constraints; lack of appropriate preparation for those teachers resulted in lack of applications of the AT; lack of familiarity with the equipment; incomplete awareness of the application; and negative attitudes towards the implementation of such devices and programs with the students.

To achieve laudable improvement towards students with learning disability in the society, Allan (2015) and Raskind (2000) identified the principles behind the introduction of this technology for effective teaching and learning process among students with learning disabilities, including to be used as part of the educational process, and can be used to teach basic skills in a way that makes students with learning disability achieve specific tasks on their own.

There are some common everyday low-tech devices such as color highlighters that are inexpensive that will allow students to identify troublesome words that may look similar, such as found and fond. When students use such a device it will enable them to differentiate between the

words (Raskind, 2006). The following are other ways in which AT can help students with LD with reading: A student who has difficulty reading can look at a series of pictures in sequence from a view finder/computer, and be able to write a story based on what the pictures portray. If the student cannot write the story, then he/she will be able to produce the story orally. A student can learn to read the sounds of the letters in the alphabet by listening to a listening device. A student with dyslexia, with the help of AT can read aloud in the classroom. A student can attempt more challenging reading materials with assistance from an AT device that can facilitate reading. A student who may have difficulty reading on a flat surface may use a slant board. A student who has difficulty with reading comprehension can get the reading material tape recorded. It can also be presented using graphic organizers/story mapping (Raskind, 2006).

AT has the potential to increase developmental skills and also provide solutions to challenges, such as behaviour, attention, and communication, faced by students identified with disability(ies) (Parette & Stoner, 2008). Since IDEA (2004) mandates the provision of AT for all students with disability upon their educational or functional needs, the researchers reported many benefits of using AT to support students with disability(ies). While all learners are different, such benefits may include: provision of practical options for supporting students with disability(ies) in their least restrictive environment, it is used to enhance student's communication skills, AT support student's access to academic instruction, AT is used to create visual supports and positive behavior support systems for students (Parish, 2017). Similarly, Chiang and Liu (2011) in their studies posited on benefits of assistive reading software noted that children with reading impairment could benefit from AT for their reading development process and increase their chances of not falling behind peers. Furthermore, AT as in the form of smart-phones and tablets may assist students with reading impairment to have equal chances for learning in school as their peers without reading difficulties.

Furthermore, AT devices increase motivation and interest to learn in reading activities. Interestingly, the authors noted that AT had wider effects on its users due to reducing stigmatizing situations when students with learning disability(ies) leave the classroom for special education were avoided and positive effects on family life were noted. The authors indicated that facilitation of independence was among the most frequently cited benefit by parents and teachers. Furthermore, the authors added among other benefits to enhance social interactions among peers, increased motivation, and reported self-esteem. Another area that AT benefits students with learning disabilities as noted by Copley and Ziviani (2004) is the improvement of academic skills,

such as hand writing, motor skills, reading acquisition and comprehension, visual attention, perception and mathematic skills. Above all, AT improved the overall working habits and productivity of students with disability (Chiang & Liu, 2011).

The adoption and use of AT for the students with disability therefore becomes imperative and requires attention of families and professionals as a result of its potential for improving the reading ability of children with learning disability(ies). Right from the global embrace of computers, communication tools to environmental controls; the use of technology present many students with disabilities the necessary tools to be more successful in school and achieving independence in daily living. Without doubt, opportunities now abound nowadays to some students with disabilities with the support of emerging technology, raising new hopes, which had in the past unavailable (Adebisi, Liman & Longpoe, 2015). As exceptionally significance of AT to the students at all levels in universities has been the use of computer and other technologies, as extended to students with learning disabilities, have enhanced lives and given many students with learning disabilities alternatives of superseding in their diverse educational problems, with available resources to assist both lecturers and students to prevail over classroom teaching challenges.

However, Nkwoagba (2011) opined that AT can open doors and break down barriers for students, youth, students with visual impairment and learning disabilities in the classroom or place of work. Also, technology that is used for students with learning disabilities, such as spell-check, can be mainly helpful to students with learning disabilities (Adebisi, Liman & Longpoe, 2015). This study therefore, will provide an answer to why the use of AT for students with learning disabilities; types of AT for teaching visually impaired students such as: written language, reading, listening, memory and technologies; the need of selecting the right technology for the students with learning disabilities; and underline guides for the classroom lecturers for teaching students with learning disabilities.

Purpose of the Study

The general purpose of the study was to examine the influence of AT on effective teaching for students with learning disabilities in Universities in North West Region of Nigeria. Specifically, the study sought to:

1. Determine useful technological devices to assist students with learning disabilities in universities.
2. Ascertain challenges of AT for students with learning disabilities in universities.

3. Determine benefits of AT for students with learning disabilities in universities.

Research Questions

The following research questions guided the study.

1. What are the assistive technologies to assist students with learning disabilities in universities?
2. What are the challenges of AT for students with learning disabilities in universities?
3. What are the benefits of AT to enhance students with learning disabilities in universities?

Research Hypothesis

The null hypothesis below was formulated and tested at 0.05 level of significance.

Ho₁: There is no significant influence of the assistive technology on the mean rating of students with learning disability(ies) in the Universities in the North West Region of Nigeria.

Methodology

The study adopted a descriptive survey research design was carried out in North West Region of Nigeria. The population of study was made up of 230 visually impaired persons in Kano State and Jigawa State. The selected states are represented by 100 students with learning disabilities from Jigawa State and 130 others from Kano State. Since the population was manageable, there was no sample technique performed. The instrument used for data collection was a (42) item questionnaire developed by the researchers titled: "Assistive Technology Teaching for Students with Learning Disability(ies) (ATTSLD)". The questionnaire was validated by three experts, two from the Department of Psychology and Guidance and Counseling, School of General Education, Aminu Kano College of Islamic and Legal Studies, Kano state and one from the Department of Educational Foundations, University of Nigeria, Nsukka. It was also tested for reliability using Cronbach Alpha method reliability technique and a coefficient of 0.87 was obtained. Mean and standard deviation analysis were used to answer the two research questions. To answer the research questions, decision ruled is that any item mean scores that is above 2.50 was regarded as accepted and any item mean scores that is below 2.50 was regarded as rejected. The response mode to the items is a four likert scale raring of Strongly Agree (4), Agree (3), Disagree (2) and Strongly Disagree (1), while z-test was used to answer null hypothesis formulated for the study.

Results

Research questions One: What are the assistive technologies for students with learning disabilities in universities?

Table 1: Mean Scores and Standard Deviation of assistive technologies for students with learning disabilities in universities.

S/N	Items	Jigawa State		Decision	Kano State		Decision
		M	SD		M	SD	
1	Microprocessor equipment	2.51	0.75	A	2.55	0.65	A
2	Non-electronic aids	2.56	0.74	A	2.56	0.65	A
3	Computer software	2.58	0.74	A	2.52	0.66	A
4	Portal word processor	2.78	0.72	SA	2.70	0.64	A
5	Spelling checkers	2.98	0.70	SA	2.90	0.62	SA
6	Speech recognition	2.76	0.72	A	2.67	0.64	A
7	Abbreviation expanders	2.52	0.75	A	2.52	0.66	A
8	Optical character recognition systems	2.74	0.73	A	2.55	0.65	A
9	Free-form databases	2.89	0.71	SA	2.73	0.64	A
10	Talking calculators and Electronic Dictionaries	2.50	0.75	A	2.53	0.66	A
11	Proofreading programmes	2.60	0.74	A	2.66	0.64	A
12	Multimedia composing tools	2.90	0.71	SA	2.72	0.64	A
13	Word prediction software	2.78	0.72	SA	2.75	0.64	A
14	Speech synthesis	2.69	0.73	SA	2.82	0.63	A
15	Electronic math worksheets	2.91	0.71	A	2.50	0.66	A
Grand Total		2.71	0.73	A	2.65	0.65	A

Table 1 show that respondents align with items 1 to 15 useful technologies to assist students with learning disabilities in universities which is more than the criterion mean of 2.50 being the acceptance level of mean scores. This implies that the statements in items 1 to 15 are useful technologies devices to assist students with learning disabilities in universities with the grand mean score of 2.71 (0.73%) for Jigawa State and 2.66 with the standard deviation on 0.65% for Kano State respectively.

Research question two: What are the challenges of Assistive Technology for students with learning disabilities in universities?

Table 2: Mean Scores and Standard Deviation of challenges of Assistive Technology for students with learning disabilities in universities?

S/N	Items	Jigawa State			Kano State		
		M	SD	Decision	M	SD	Decision
16	Lack of specialized ICT teachers for the students with learning disabilities	2.56	0.74	A	2.54	0.65	A
17	Limited flexibility in training options for children with learning disabilities	2.67	0.73	SA	2.78	0.63	SA
18	Limited availability of specialized disabled friendly hardware and software resources in developing countries	2.76	0.72	SA	2.87	0.63	SA
19	Lack of formal involvement of the government organizations and support structure for ICT for the persons with learning disabilities	2.87	0.71	A	2.76	0.63	SA
20	Attitude barriers towards students with disabilities	2.87	0.71	A	2.59	0.65	A
21	Lack of appropriate disabled legislation and policies and their implementation	2.59	0.74	SA	2.85	0.63	SA
22	Limitation of finances	2.60	0.74	A	2.50	0.66	A
23	Lack of resources to purchase assistive technology equipment	2.67	0.73	SA	2.72	0.64	SA
24	Scarcity of trained teachers to assist in choosing and obtaining assistive technology devices	2.85	0.72	SA	2.75	0.64	SA
25	Lack of appropriate staff training and	2.56	0.74	A	2.89	0.62	SA

26	support Negative attitudes staff	2.55	0.75	A	2.90	0.62	SA
27	Inadequate assessment and planning processes	2.87	0.71	SA	2.63	0.65	A
28	Insufficient fund	2.60	0.74	A	2.73	0.64	SA
29	Time constraints	2.81	0.72	SA	2.86	0.63	SA
30	Lack of appropriate preparation by teachers	2.63	0.74	A	2.56	0.65	A
31	Lack of familiarity with the equipment	2.76	0.72	SA	2.98	0.62	SA
32	Negative attitudes of students towards the use of assistive technology devices.	2.78	0.72	SA	2.99	0.61	SA
Grand Total		2.71	0.73	SA	2.76	0.64	SA

Table 2 indicates that the mean ratings of challenges of Assistive Technology for students with learning disabilities in universities in the items 16 to 32 are more than the criterion mean of 2.50 being the acceptance level of mean scores. However, the overall mean ratings of the students is 2.71 with a standard deviation of 0.73 for Jigawa State and overall mean score of 2.76 with a standard deviation of 0.64 for Kano State. This implies that statements of items 16 to 32 are challenges of Assistive Technology for students with learning disabilities in universities.

Research question three: What are the benefits of Assistive Technology to enhance students with learning disabilities in universities?

Table 3: Mean Scores and Standard Deviation of benefits of Assistive Technology to enhance students with learning disabilities in universities?

S/N	Items	Jigawa State			Kano State		
		M	SD	Decision	M	SD	Decision
33	Assistive technology enhances social interactions among peers, increased motivation, and reported self-esteem.	2.99	0.70	A	2.60	0.65	A
34	Assistive technology help students with multiple disabilities control their environment.	2.56	0.74	A	2.53	0.66	A
35	Assistive technology devices	2.98	0.70	A	2.59	0.65	A

	increase motivation and interest to learn in reading activities						
36	Assistive technology assists students with reading impairment to have equal chances for learning in school as their peers without reading difficulties.	2.76	0.72	A	2.76	0.63	SA
37	Assistive technology is used to create visual supports and positive behaviour support systems for disabilities students.	2.98	0.70	A	2.90	0.62	SA
38	Assistive technology support student's access to academic instruction.	2.65	0.74	A	2.70	0.64	SA
39	Assistive technology enhances student's communication skills.	2.76	0.72	SA	2.90	0.62	SA
40	Provision of practical options for supporting students with disabilities in their least restrictive environment.	2.78	0.72	SA	2.89	0.62	SA
41	Assistive technology increases the developmental skills and solutions to challenges, such as behaviour, attention, and communication, faced by students identified with disabilities.	2.73	0.73	A	2.57	0.65	A
42	Assistive technology improved the overall working habits and productivity of students with learning disabilities.	2.90	0.71	SA	2.85	0.63	SA
Grand Total		2.81	0.72	A	2.73	0.64	SA

Table 3 shows that the mean ratings of benefits of Assistive Technology to enhance students with learning disabilities in universities to the items 33 to 42 are more than the criterion mean of 2.50 being the acceptance level of mean scores with the overall mean score of 2.81 Jigawa State (072%) and 2.73 for Kano State with a standard deviation of 0.64. This implies that the statements in items 33 to 42 are the benefits of Assistive Technology to enhance students with learning disabilities in universities.

Test of Hypothesis

Ho₁: There is no significant influence of the assistive technology on the mean rating of students with learning disability (ies) in the Universities in the North West Region of Nigeria.

Table 4: z-test of difference between the mean ratings of visually impaired students in Jigawa State and Kano State on responses using technologies devices to assist students with learning disabilities in universities.

States	No of Responses	X	SD	DF	Z-Calculated	T-Critical Value	Results
Jigawa State	100	2.74	0.73	228	3.53	1.96	
Kano State	130	2.71	0.64				

Table 4 shows that the z-test of difference in the mean ratings of visually impaired students in Jigawa State and Kano State on responses using technologies devices to assist students with learning disabilities in universities. The mean ratings tested at 5% level significance, was not significant. The z-calculated of 3.53 was greater than the t-critical value of 1.96. This means that there is no significance difference in the mean ratings of visually impaired person's responses on using technologies devices to assist students with learning disabilities in universities in Jigawa State and Kano State.

Discussion of findings

The findings of the study in research question one sought to find out useful technologies to assist students with learning disabilities in universities. From the findings, the study revealed that all the respondents agreed to the items number one to fifteen on the useful technologies to assist students with learning disabilities in universities which all rated above 2.50 by the Jigawa State and Kano State students respectively. The findings of the study is in an agreement with the study of Raskind (2004) who suggested a numbers of useful technologies that may be helpful in assisting students with disabilities to overcome their difficulties, such as: word processors, spell-checking programmes, proofreading programmes, outlining (Brain Storming), speech recognition, abbreviation expanders, speech synthesis, optical character recognition systems, free-form databases, and talking calculators. The result of the findings is also in line with Cutler (2001) who concluded that spellcheckers were useful in helping students with disabilities compensate for their spelling difficulties.

The findings of the study in research question two shows the challenges of AT for students with learning disabilities in universities. The findings of the study revealed that all the respondents agreed on the items number sixteen to thirty-two on the challenges of AT for students with learning disabilities in universities which are also rated above 2.50 in both states. The items are: Lack of specialized ICT teachers for the students with learning disabilities, Limited flexibility in training options for children with

learning disabilities, Limited availability of specialized disabled friendly hardware and software resources in developing countries, Lack of formal involvement of the government organizations and support structure for ICT for the persons with learning disabilities, Attitude barriers towards students with disabilities, Lack of appropriate disabled legislation and policies and their implementation, Limitation of finances, Lack of resources to purchase AT equipment, Scarcity of trained teachers to assist in choosing and obtaining AT devices, Lack of appropriate staff training and support, Negative staff attitudes, Inadequate assessment and planning processes, Insufficient fund, Time constraints, Lack of appropriate preparation by teachers, Lack of familiarity with the equipment, Negative attitudes of students towards the use of AT devices. The student could not cope up with learning as a result of the challenges of AT both in Jigawa State and Kano State. The findings of the study is inline with the study of Mishra, Sharma and Tripathi (2010) who outlines some challenges that may hindered students with learning disabilities, such as lack of specialized ICT teachers for the students with learning disabilities, limited flexibility in training options for children with learning disabilities, limited availability of specialized disabled friendly hardware and software resources in developing countries, lack of formal involvement of the government organizations and support structure for ICT for the persons with learning disabilities, attitude barriers towards children with disabilities, lack of appropriate disabled legislation and policies and their implementation, and limitation of finances.

The findings of the study in research question three shows the benefits of AT to enhance students with learning disabilities in universities. From the findings, it is revealed that all the respondents agreed to the items number thirty-three to forty-two on the benefits of AT to enhance students with learning disabilities in universities which are also rated above 2.50 by the Jigawa State and Kano State. The items are: AT enhances social interactions among peers, increased motivation, and reported self-esteem, AT help students with multiple disabilities control their environment, AT devices increase motivation and interest to learn in reading activities, AT assists students with reading impairment to have equal chances for learning in school as their peers without reading difficulties, AT is used to create visual supports and positive behaviour support systems for disabilities students, AT support student's access to academic instruction, AT enhances student's communication skills, Provision of practical options for supporting students with disabilities in their least restrictive environment, AT increases the developmental skills and solutions to challenges, such as behaviour, attention, and communication, faced by students identified with disabilities, AT improved the overall

working habits and productivity of students with learning disabilities. The above items are the benefits of AT to enhance students with learning disabilities in universities as both States has agreed to it. Similarly, the findings of the study is in consonant with the study of Chiang and Liu (2011) who posited on benefits of assistive reading software noted that children with reading impairment could benefit from AT in regards of their reading development process and increase their chances of not falling behind peers.

Conclusion

Convincingly, it understandable to articulate that AT have a momentous outcome in helping students with learning disabilities in organize to convene the objectives of their learning development. Owing to the literacy barriers, students with learning disabilities might require AT devices and software for effective teaching and learning in the society where they live. Interesting, a number of examine studies have been carried out on how Information and Communication Technologies (ICT) can influence the development of students with learning disabilities and how technology can develop student's self-sufficient learning process, active participation in classroom discussions and leisure activities. However, ever since each student with a learning disability is unique, special educators need to successfully resolve the desires of the student and provide the corresponding assistive technology devices. Similarly, in order to implement AT as learning tools to sustain students with special needs and teachers' views on effective use of assistive technology in teaching and learning are important. The study also investigated how Information and Communications Technologies (ICT) cum AT influence the education of students with learning disabilities through adaptations that have been widely used to recompense for barriers associated with problems in reading, writing, mathematical reasoning, and problem solving. The potential of AT for students has not been realized; the future is in doubt but holds much prospect. Above all, AT can improve the lives and to eliminate learning difficulties for children with learning disabilities.

Recommendations

Based on the findings of the study, the following recommendations were made.

1. Special education teachers, especially in post-primary schools and universities, should be exposed to technological tools that can help students to bypass their academic weaknesses.

2. The assessment of students' needs and demands of the postsecondary environment should determine the appropriate selection of assistive technology.
3. Training students with learning disabilities properly using assistive technology devices will help them increase their educational gains and eliminate learning difficulties.

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