

TEACHERS' FACILITATION IN UTILIZATION OF ASSISTIVE TECHNOLOGY IN PROMOTING LEARNING OF STUDENTS WITH VISUAL IMPAIRMENT AT POST GRADUATE LEVEL

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Abstract

Assistive technology plays a significant role in the learning of students with visual impairment. This study aims to find out teachers' facilitation in utilization of assistive technology in promoting learning of students with visual impairment at post graduate level. This research is basically descriptive in nature and for the collection of data survey method is used. The questionnaire is used to collect data from participants. The population of this study consisted of the 27 male and 22 female students and 22 male and 10 females' teachers of special education department from university of Okara, PU, Lahore, Bahauddin Zakariya University, Multan, University of Education, Lahore. A questionnaire self-structured and self-validated including 34 items for teachers and 15 items for students is used to investigate teachers' facilitation in utilization of assistive technology in promoting learning of students with visual impairment at post graduate level. Sample is selected by census sampling technique. The findings reveal that small number of assistive technology is available for visually impaired students in universities and to some extent are being used in the universities. The finding also revealed that assistive technology plays a positive role in promoting the learning of students with visual impairment

Key words Facilitation, utilization, assistive technology, post graduate level Visual Impairment.

1.1 Introduction

Students who are blind or visually impaired can use assistive technology (AT) to read print, read digital text, produce their own materials in accessible formats like Braille, read and interact with multimedia, analyze and understand data, and do research (Siu & Presley, 2020). The rapid speed of technological innovation means that we need to reassess how we use technology in our daily lives and in the classroom in order to adapt to the digital age. According to Abner and Lahm (2002), there is a significant correlation between teacher knowledge and students' use of VT for BI. Education is only one area where technological advancement has had far-reaching consequences. It has been quite some time since educational technology for students with special needs underwent such a radical transformation. Assistive technologies have been very useful in

aiding children in need of special education to develop and employ daily functional abilities (Gierrach & Stindt, 2009).

Assistive technology is "any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized that is used to increase, maintain, or improve functional capabilities of a child with a disability" (IDEA, 2004). According to the Department of Basic Education (2011d), "assistive technology" (AT) includes any item or service that helps a student with a disability meet the objectives of their IEP and participate as fully as possible in a typically-developing classroom setting.

1.2 Literature review

The term "assistive technology" is used to describe a wide range of gadgets and aids for individuals with disabilities, from the most basic, like crutches or a pen with a specific grip, to the most advanced, such computers with specialist software for enabling dyslexics to read and write. Assistive technology includes things like accessible technologies, instructional technologies, emerging and innovative technologies, and information and communication technologies (ICT). Students with disabilities have access to assistive technologies both within and outside of the classroom. A magnifying glass is one example of this technology, while a sophisticated electronic communication system is another. Alternative keyboards and mice, word prediction programs, word processors, grammar and spelling checkers, scanners, CD-R and CD-RW players, and spell checkers are all examples of assistive technologies (Petty, 2012).

Assistive technology, as defined by Jonassen and colleagues (2008), is a product system that has been adapted to meet the unique needs of children and students with special needs, allowing them to retain or reclaim a measure of functional independence. Large print, speech, braille, and electronic versions of materials are only some of the accessible options for students with visual impairments (Hasselbring & Glaser, 2012). According to Jackson (2009), in the current era of educational integration, globalization, and inclusion, educators and students with disabilities at all levels need in-depth knowledge of how technology can enhance performance, increase participation in instructional activities, and ultimately lead to better learning outcomes.

If schools and teachers use assistive technology, students with disabilities enjoy a level playing field in terms of academic progress and extracurricular involvement (Andrea & Presley, 2009). Visually impaired people can achieve success in both the classroom and the job with the use of accessible technology. In addition, they show how a computer may be a savior for the visually challenged by giving them access to independent communication tools like email and word processing. A student who learns how to effectively use it will become more self-reliant and productive in their studies. According to D'andrea and Presley (2009), a PDA or note taker can help a visually impaired learner get more done in less time. The learner's brain has a backup in the form of assistive technology such as a computer with speech capabilities, a braille line, a braille input keyboard, a calendar, work-related files and notes, and so on.

According to the United Nations Convention on the Rights of Persons with Disabilities (UN CRPD, 2006), governments and relevant ministries must ensure that people with disabilities have equitable access to resources including education and employment. To ensure that people with disabilities can fully exercise their human rights, the treaty presents a number of novel and forward-thinking ideas. It argues that the availability of information and communication technologies (ICTs) should be provided to all people, just as basic amenities like clean water and safe transportation are. According to Article 9 of the United Nations Convention 4, having access

to information and communication technologies helps people exercise their right to an education, a job, and autonomy. According to the South Carolina Assistive Technology Program (2015), the use of assistive technology has several positive effects on children. The reviewed literature has shown the potential of assistive technology and how it can help students who are falling behind catch up. Thanks to technological advancements, all children and adults in industrialized countries are now expected to receive an education of the highest caliber. Educators have been provided with a wealth of new information about how to help their pupils who are visually impaired succeed in the classroom as a direct result of this research.

1.3 Significance of the Study

This study examined the teachers' facilitation in the utilization of assistive technology in promoting the learning of students with visual impairments at the postgraduate level. Many people involved in special education stand to gain a lot from this study. This study will help policymakers and educators realize the importance of incorporating assistive technology into their special education practices and programs. The study will be beneficial to educators since it demonstrates the merits of using today's assistive technology with students who have special needs. The study will be useful to students since it will show them the ways in which they can improve on their own, without the support of adults, in order to reach their academic potential. Particularly useful for parents, the study shows how and why they should invest in assistive technology for the sake of their children's academic success. For future researchers interested in exploring how students with visual impairments make use of assistive technology, this study provides valuable context.

1.4 Objectives of the Study

Objectives are important to complete the research study. It's an essential component of research. A research objective is a clear and concise statement which provides direction to look into the variables. Generally, research objectives focus on the ways to measure the variables in order to identify or describe them.

The objectives of the study were to investigate:

1. To investigate the teachers' facilitation in utilization of assistive technology in promoting learning of students with visual impairment at post graduate level.
2. To find out the utilization of assistive technology in promoting learning of students with visual impairment at post graduate level.
3. To analyze the role of assistive technology in promoting learning of students with visual impairment at post graduate level.
4. To compare teachers' opinion regarding teachers' facilitation in utilization of assistive technology in promoting learning of students with visual impairment at post graduate level on the base of demographics i.e., gender, qualification, teaching experience.

1.5 Research Questions

1. What kind of facilities are available for the teachers regarding utilization of assistive technology in promoting learning of students with visual impairment at post graduate level?
2. What types of assistive technologies are used in promoting learning of students with visual impairment at post graduate level?
3. What is the role of assistive technology in promoting learning of students with visual impairment at post graduate level?

4. Is demographics i.e. gender, qualification, teaching experience etc. of teachers may have effect on teachers’ opinion regarding teachers’ facilitation in utilization of assistive technology in promoting learning of students with visual impairment at post graduate level?

1.6 Research Design

The study entitled “The teachers’ facilitation in utilization of assistive technology in promoting learning of students with visual impairment at post graduate level”. This study used a cross-sectional survey design. An example of an observational study design is a cross-sectional survey. In a cross-sectional study, the researcher equally assesses the participants' exposures and outcomes. A questionnaire was contained 15 items for students and 34 items for teachers. The study was quantitative in approach. The quantitative approach was utilized for this study. This study was a survey design

1.7 Population, Sample and Sampling Technique

The term “population” as utilized in research, refers to all group members. A population is a group of individuals, objectives, or items from which samples are chosen for measurement. A group of individuals, objects, or events that comply with particular criteria and generalize the consequences of the research. The population was 49 students of special education department from university of Okara (12), PU, Lahore (8), BZU, Multan (11), UE, Lahore (18) and 32 teachers of special education department from university of Okara (09), PU, Lahore (06), BZU, Multan (10), UE, Lahore (7).

1.8 Instrument of Study

The instruments of research are the tools that are utilized by the researcher to gather the necessary data they need. To collect data for the study in hand, the research process was a self-developed questionnaire.

1.9 Rough Draft

In the light of literature review and discussion of the supervisor draft of the questionnaire developed. It consisted of 15 items for students and 34 items for teachers.

1.10 Expert Opinion

Expert opinions are logical perspectives or remarks by a gathering of assigned specialists dependent on a study of logical proof and additionally well-qualified evaluations. Expert opinion was sought, and all suggestions by the expert were incorporated in the questionnaire.

1.11 Reliability of the Tool

Reliability is related to the consistency of the implications maintained by a data collection instrument. The credibility of the instrument depends on whether the research instrument is consistent and expert and generating the same data when it is repeated several times in order to maintain consistency of the research instrument. It was tested for corrections and modifications. The Cronbach alpha technique was used to determine the reliability of the instrument.

Table 1 Reliability of the tool

Sr No.	Category	No. of items	Cronbach’s Alpha
1	Teachers	34	0.71
2	Students	15	0.70

The tool was administered by using a Google form, email, and manually.

1.12 Data collection

The researcher collected the data by using various sources and with the help of Google form, manually, and friends. Questionnaire was distributed to 32 teachers. 28 teachers returned the questionnaire which means 87.5 was the returned rate. Similarly, questionnaire was sent to 49 students of selected universities, 44 students respond the questionnaire which represents the 89.7 returned rate.

1.13 Data Analysis

As the study deals with the teachers’ facilitation in utilization of assistive technology in promoting learning of students with visual impairment at post graduate level, the data was analyzed in light of the research objectives and research questions of the study. The data were analyzed by using frequency, t-test, Mean, Standard Deviation and ANOVA.

1.14 Analysis and interpretation of data

1.14.1 Analysis of Teachers Data

Table 2 Describe the factors wise data of teacher’s opinion

SR NO.	Factors	Mean
1	Role of Assistive Technology in Promoting Learning on the basis of teachers’ opinion.	3.84
2	Availability of Resources on the basis of teachers’ opinion	1.36
3	Utilization of Assistive Technology on the basis of teachers’ opinion	1.96
4	Assistive technology in promoting learning approach on the basis of students’ opinion	3.74

Table 2 shows factors wise means of the statements. The Role of Assistive Technology in Promoting Learning on the basis of teachers’ opinion is very much important and the mean value (3.84) also supports the claim. The resources in universities are at minimum level and mean value (1.36) also support the claim. According to the teachers opinion the available resources not fully functional and less utilized and the mean value (1.96) support this claim. According to the students opinion assistive technology is supportive and promote their learning and mean value (3.74) also support the claim.

Table 3 Differences in based on gender

Variables	Category	N	Mean	SD	Df	T	Sig.
Gender	Male	22	3.7948	13.92474	26	-.304	.805
	Female	6	3.4230	17.65692			

Table 3 shows that male sample teachers had a better opinion of assistive technology in promoting visual impairment learning (Mean =3.79) than female (Mean = 3.42). The significant value is greater than 0.05 shows that there is no difference between opinions of teachers.

Table 4 *Difference between Teachers' Opinions by Locality*

Variables	Category	N	Mean	SD	Df	T	Sig.
Locality	Rural	7	3.4231	18.81236	26	-.431	.199
	Urban	21	3.7948	13.20462			

Table 4 demonstrates that urban teachers had a higher opinion of promoting learning of students with visual impairment than rural educators (Mean =3.4231 vs. 3.7948). Therefore, locality-based variances in teachers' views on visual impairment education were substantial. The significance value is (.199) is greater than 0.05. The views of teachers are not significantly different by locality.

Table 5 *Difference between Teachers' Opinions by Designation*

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1288.190	2	644.095	3.691	.039
Within Groups	4362.524	25	174.501		
Total	5650.714	27			

Table 5 compares teacher opinions by designation. The significance value is (.039) is less than 0.05. The views of teachers are significantly distinct by designation.

Table 6 *Difference between Teachers' Opinions by university*

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	3123.619	3	1041.206	9.888	.000
Within Groups	2527.095	24	105.296		
Total	5650.714	27	1041.206		

Table 6 shows university-specific teacher perspectives. The estimated significance value is less than 0.05. Teachers' opinions are different by university statistically.

Table 7 *Difference between Teachers' Opinions by Academic Qualification*

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	967.314	1	967.314	5.37	.029
Within Groups	4683.400	26	180.131		
Total	5650.714	27			

Table 7 shows teachers' opinions by academic qualification. The significance value .029 is less than 0.05. The perspectives of teachers weren't statistically different by greatest academic qualification

Table 8 Difference between Teachers' Opinions by Teaching Experience

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1051.714	3	350.571		
Within Groups	4599.000	24	191.625	1.829	.169
Total	5650.714	27			

Teachers' perceptions vary by teaching experience, as seen in Table 8. The estimated significance value (.169) exceeds 0.05. There is no significant difference in opinions of teachers by teaching experience. F value (1.829) backs up the claim.

Table 9 Differences in based on students gender

Variables	Category	N	Mean	SD	Df	T	Sig.
Gender	Male	25	3.77	.776	42	.318	.738
	Female	19	3.70	.610			

Table 9 shows gender-based descriptive and inferential analysis. Gender had a significant effect (df =42, t =.318, sig.738 >.005) on students' opinions about using assistive technology to help postgraduate students with visual impairment to learn. Table 9 shows that male sample students had a higher opinion of assistive technology's role in facilitating visual impairment students' learning (Mean=3.77) than female sample students (Mean=3.70). Thus, gender wise there is no difference between student opinions towards increasing visual impairment learning.

Table 10 Difference between Students' Opinions by Locality

Variables	Category	N	Mean	SD	Df	T	Sig.
Locality	Urban	23	3.7021	.52888	42	-.433	.234
	Rural	21	3.7948	.86586			

Table 10 shows that urban sample students had a better opinion of promoting visual impairment learning (Mean= 3.70) than rural students (Mean=3.79).. The computed significance value.234 is larger than 0.05, indicating that there is no significant difference in the opinions of urban and rural students.

Table 11 Difference between Students' Opinions by university

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.866	3	.955	2.080	.118
Within Groups	18.376	40			
Total	21.242	43			

Table 11 shows university-specific student perspectives. The estimated significance value .118 is

more than 0.05. This indicates that there is no significant variation in student opinions by university.

1.15 Discussion

This study demonstrates a correlation between its explanatory variables and its response variables. Teachers that make use of assistive technology for their post-graduate students with visual disabilities report seeing an uptick in student achievement. Students with mobility, sensory, or cognitive impairments can benefit from this technology's use in the classroom. Such resources equip educators with resources to aid students with special needs in overcoming their impairment. (Oira, 2016)

D'Andrea and Presley (2009) state that with the right assistive technology, people with visual impairments can work and study independently. They also show that a personal computer is a lifeline for the visually impaired since it allows them to communicate independently through means such as email and word processing. A pupil who has learned to use it effectively can become more self-reliant and productive. Both D'andrea and Presley (2009) agree on this. Today's assistive technology allows disabled students to learn more efficiently and with less stress than ever before (Westwood, 2018).

Any piece of equipment that enables a student with a disability to complete a task more rapidly, effortlessly, or independently is considered assistive technology, as defined by the American Foundation for the Blind (2015). Jonassen and colleagues (2008) agree, noting that assistive technology in the classroom is a product system tweaked to maximize, preserve, or enhance the functional skills of children or students with special needs.

Assistive technologies are a type of technology used to make educational environments more accessible for students with disabilities. Students with visual impairments can benefit from this kind of technology in the classroom. Such resources equip educators with resources to aid children with special needs in overcoming their impairment.

1.16 Conclusions

The conclusion of the whole study is according to the objectives of the study

- 1 This study indicated that the limited facilities of assistive technologies for students with visual impairment is available and functional to some extent like voice recorders, Jaw's in some universities, with the majority of respondents the major facilities of assistive technologies are not fully available like braille embossers, Perkin Braille, OCR (Optical Character Recognition) etc. at post graduate level.
- 2 While there is utilization of AT, teachers of students with visual impairment were allow the students to use their available assistive technologies in the class room to improve their learning. According to the respondent; small number of assistive technologies is used in universities. The limited use of assistive technologies affects the teaching process and students are not fully achieving their learning goals.
- 3 The role of assistive technology in promoting learning of students with visual impairment at post graduate level. Assistive technology positively improves the academic performance of the students with visual challenges. It helps the students with visual impairment to read, write and compete with their non-disable peer. According to the research; assistive technology is useful for independent learning of students with visual challenges.

- 4 According to the research there is less significant difference between teachers opinion regarding teachers' facilitation in utilization of assistive technology in promoting learning of students with visual impairment at post graduate level on the base of demographics i.e., gender, qualification, teaching experience.

1.17 Recommendations

The following recommendations of the study based on the findings were made:

1. The government, via the Ministry of Education, Science, and Technology, needs to acknowledge the value of AT in helping students with visual impairment succeed in school.
2. The most effective assistive technologies are those that help a student with a specific impairment participate fully in the general curriculum and eventually function independently in any society. Consequently, there must to be criteria for selecting such to guarantee their usefulness in terms of student accomplishment.
3. Teachers should have the resources and support they need to help their students with visual impairment learn with the help of computers and other assistive technologies.
4. Everyone involved with the education of students with visual impairments should be made aware of the many opportunities presented by assistive technology so that everyone may work toward adopting it for the sake of the students' long-term academic autonomy.

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