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Impact of Audio Aids on Visually Impaired Students Learning Achievement at School Level in Islamabad

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ABSTRACT

This study investigated the impact of audio aids on the learning achievement of visually impaired students at the school level in Islamabad. The objectives were to examine the availability and frequency of use of audio aids and their impact on students' learning achievement. A descriptive research design was employed. The study population comprised 400 visually impaired students, from which 194 participants were selected through purposive sampling using the L.R. Gay sampling table. Data were collected through a structured close-ended (Yes/No) checklist and analyzed using SPSS and Binary Logistic Regression. The findings revealed that while most schools provided basic audio aids, including recorded lessons, trained teachers, audio-based software, and resource rooms, advanced resources such as audiobooks, internet access, and headphones were limited. Students generally perceived audio aids as effective for improving comprehension, memory, listening skills, language learning, and learning interest, although their regular use in classroom instruction remained low. Regression analysis showed that gender and age were not significant predictors of students' perceptions, whereas grade level had a significant effect. The study concludes that audio aids are valuable instructional resources for enhancing the learning achievement of visually impaired students.

Introduction

The purpose of inclusive education is to offer equal education opportunities for all students

irrespective of whether they have some form of disability or not. For instance, among students who have disabilities, visually impaired students face major difficulties in accessing educational



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material given that they may either partially or completely lack vision. Conventional class room teaching involves use of visual learning materials like textbooks, graphs, drawings, and written materials that may prevent visually impaired learners from effectively engaging in classroom learning activities. Assistive technologies have played a key role in ensuring that learning is accessible for visually impaired learners. Audio aids are among the best forms of instructional tools for visually impaired students given that they help them access information using their auditory senses (Ralejoe, 2021).

Audio supports are comprised of audiobooks, recorded lectures, screen readers, talking calculators, speech synthesis, podcasts, and many other sound-oriented learning tools. With the use of such tools, the visually impaired learners can be able to access educational materials independently, improve their comprehension ability, develop memory skills, and increase the engagement levels when learning. Several studies have highlighted the benefits of audio-based learning to academic performance, concentration, vocabularies development, and motivation of learners. Additionally, audio supports encourage independence and confidence of learners through minimizing their dependency on educators, other students, and their families (Noreen et al., 2025).

Although these audio aids have significant educational value, the proper use of such audio aids has not been fully realized by many developing countries, including Pakistan. This could be due to poor technological capabilities, inadequate financial support, poor training of teachers, lack of appropriate educational materials and lack of awareness by all involved stakeholders. Even though Islamabad has relatively good educational facilities in comparison to many other parts of Pakistan, yet the differences may occur amongst the different institutions with regards to the use of audio aids as learning resources for visually impaired students. There is a necessity to look into the extent to which audio aids are available, used and their significance in contributing to the educational achievements of the visually impaired students. This study was carried out to find out the effect of audio aids on the learning achievements of visually impaired students in the schools of Islamabad (Iqbal & Ashraf, 2023).

Problem Statement

There are many obstacles that visually impaired students encounter when accessing written and visual learning materials, which makes it hard for them to meet their academic goals via traditional classroom instructions. Audio aids have proved to be useful learning tools that increase accessibility, improve understanding, foster independent learning, and help in engaging academically. Although these aids are used more and more frequently in special education settings, there is a lack of evidence concerning their efficiency in improving learning achievement of visually impaired students, especially in Pakistan. Even though special schools in Islamabad offer many audio-based learning materials, few studies were conducted to examine the effect of using audio aids on the academic achievement of students or the connection between the use of these aids and academic results. Thus, there is a need to explore the effect of audio aids on the learning achievement of visually impaired students in special schools in Islamabad.

Objective of the Study

The objectives of the study were:

1. To identify the availability of audio aids for visually impaired students in schools of Islamabad.
2. To explore the frequency of usage of audio aids in the learning process of visually impaired students.
3. To find out the impact of audio ads on the learning achievement of the visually impaired students in study area.

Research Questions

The following were the study's research questions:

1. What types of audio aids are available for visually impaired students in the schools of Islamabad?
2. How are audio aids used in the learning process of visually impaired students?
3. What is the impact of using audio aids on the learning achievement of visually impaired students in Islamabad?

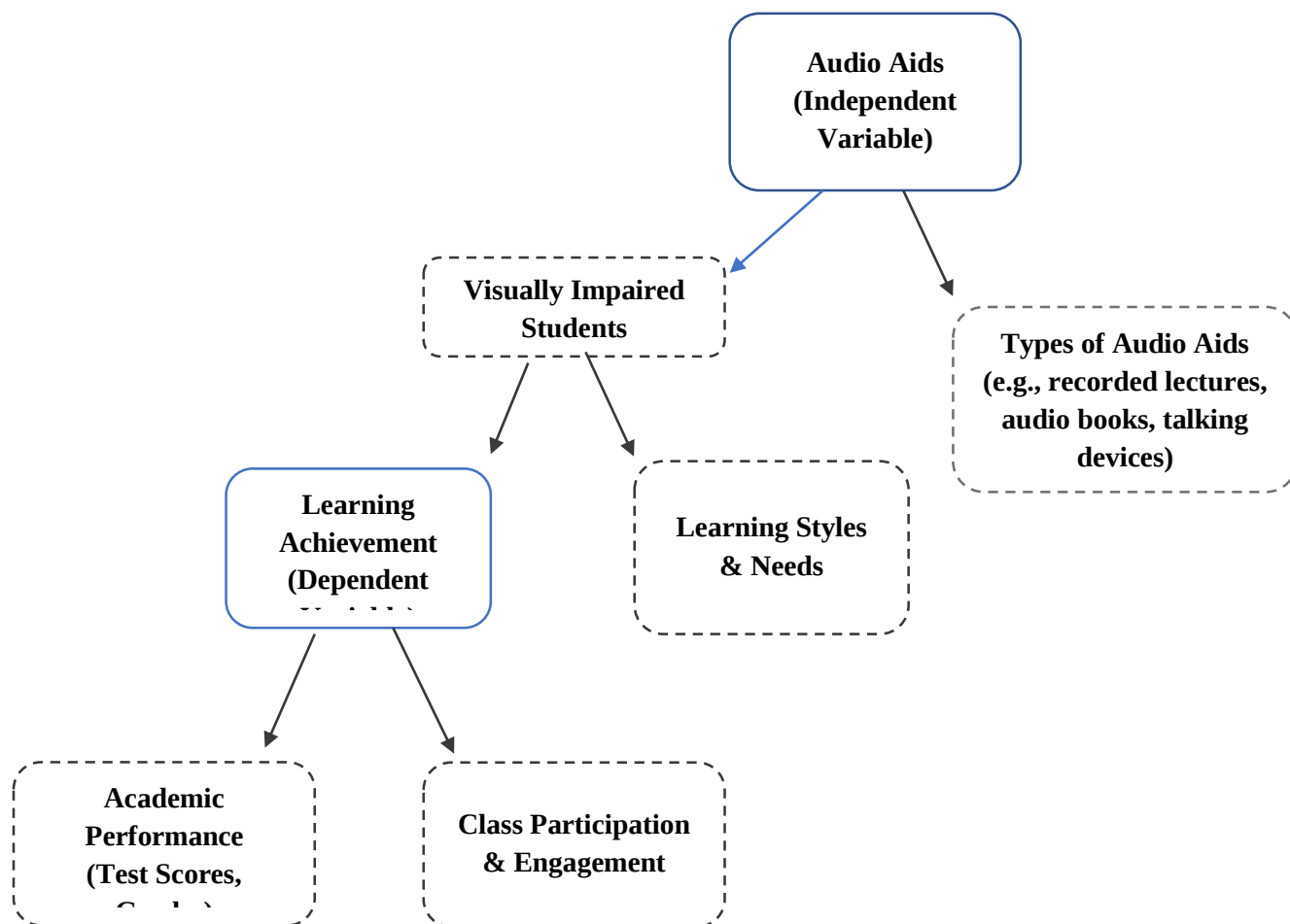
Significance of the Study

The importance of the current study can be

understood from the fact that it will lead to improving the learning process of blind children through audio aids. There are various schools in Islamabad which try their best to help such students but there are various problems with which they are struggling in their learning process. By using audio aids such as audio lessons, recorded lectures and talking books, the learning process of these students will be improved. Through this research, it will be seen that there is an improvement in the learning process of these

students or not. The findings of the study will be useful for school administration, teachers and the policy makers. Teachers will learn some new ways of teaching these children. The schools will improve the learning programs of such students. In addition, the government and education department will also use this information in order to provide better facilities to these visually impaired children. In this way, this study will be very helpful for these children to gain self-confidence.

Conceptual Framework



Literature Review

Education of the visually impaired demands the use of instructional methods that take into account their learning peculiarities. Since traditional classroom instructions depend greatly on printed literature, visuals, and writing, visually impaired students face numerous barriers which hinder their learning. Special education aims to overcome these barriers through the provision of customized instructions and relevant tools and materials which allow learners to obtain the necessary information in an independent way. One of the

possible methods which involve the use of tools and materials to provide assistance in learning is audio learning which proves to be one of the most efficient among all other assistive technologies because it makes use of the sensory abilities of visually impaired people—their hearing abilities (Ahmad et al., 2024).

The evolution of educational technology has led to an increase in the use of audio educational tools such as recorded classes, audio books, screen readers, text-to-speech programs, digitized voices, among others. Audio learning tools turn reading

and visual material into sound forms, which enable blind individuals to learn alone, practice their lessons many times, and take part in class learning activities effectively. There are many studies indicating that audio learning improves understanding, listening, concentration, memory, motivation, and confidence levels of the learners while decreasing dependence on teachers and peers. Besides academic achievement, audio learning tools promote independent learning, active participation in class activities, and social integration through equal access to educational material (Al-Namaeh, 2022).

However, despite these benefits, visually impaired learners still face problems due to limited availability of proper learning materials, poor assistive technologies, unpreparedness of teachers, and persistence in use of traditional visual modes of learning. This problem can hamper the learning processes of the learners because they will be unable to participate in classroom instructions fully. In order for audio learning to be successfully implemented, not only the availability of proper technologies but also educational setting, competent teachers, and availability of learning material is necessary. For educational technologies to meet their intended goals, it is important that teachers have the competence to incorporate them in classroom learning (Aguiar et al., 2022).

It can be seen from the existing literature that assistive technology is extremely essential to provide educational accessibilities to visually impaired learners, but almost all previous researches were carried out on general assistive technology, inclusive education, or the policies related to disabilities and not on how audio aids contribute to the academic achievements of the learners. Also, there is a scarcity of evidence from the Pakistani environment and most of the evidence is from other countries. It is also clear that there is no sufficient evidence on how audio aids are being used in special schools, the perception of teachers about the benefits of these tools, and their contribution towards improving the academic achievements of visually impaired students (Alam, et al., 2023, March).

This research paper seeks to address this gap through an analysis of the effect of audio aids on the achievement of visually impaired children in

schools in Islamabad. The research paper will also look at the availability of audio-based learning materials and the role played by the teachers in utilizing them effectively. The results of this study will contribute to the existing literature on special education through provision of evidence that can be used by teachers, school authorities, curriculum developers, and policy makers in improving teaching methods and integrating audio aids (Al-Hroub, & Jouni, 2023).

Research Methodology

This section was cover the study's methodology and design, sample selection and sampling methodology, data gathering, and data analysis.

Research Design

The descriptive survey research method was employed in this study in order to ascertain the effect of auditory devices on the learning performance of blind children in special schools in Islamabad. This approach was deemed fit for this research because through it, the researcher could be able to look at the existing educational environment and describe the situation.

Population

The sample consisted of 400 visually handicapped students (both males and females) from Al Maktoum Special School for Education Center in Islamabad. The sample included students from primary, middle, and secondary grades.

Sampling and Sampling Technique

Selection of 194 visually impaired students from a total of 400 students in a sample was done through the use of L.R. Gay sample size table. Purposive sampling was used to select the participants that fulfilled the criteria.

Research Instrument

The research instrument used in collecting data in this study was a checklist developed by the researcher. The instrument was developed in relation to the study objectives and available literature and had 36 items that were meant to measure the effect of audio aids on learning achievement of visually impaired learners.

Pilot Testing

Before the actual data gathering process, a pilot study was conducted in order to make sure that the

research instrument was clear and appropriate to use in the study. This pilot study involved the selection of 30 visually impaired students who were enrolled at a special school located in Islamabad. The research instrument that was used in this pilot test consisted of 36 Yes/No checklist statements which aimed to evaluate the effect of audio aids on the learning achievement of visually impaired students. The most important thing that the researchers wanted to accomplish in this pilot test is to verify the clarity, understandability, and suitability of the research instrument for the target participants. However, after carefully analyzing the responses in the pilot test, the researchers did not have any need to modify the checklist as it was clear and appropriate for the actual study.

Validity

The validity of the instrument was confirmed using face and content validity. The checklist was submitted to subject matter experts in special education in order to assess the relevancy, clarity, and appropriateness of its items. The input received from the experts was used in refining the instrument for data collection.

Reliability

The reliability of the instrument was assessed using Cronbach's Alpha. The instrument demonstrated good internal consistency, with a Cronbach's Alpha coefficient of 0.818, indicating that it was reliable for data collection.

Table 4.1: Demographic Information

Variable	Category	f	%
Gender	Male	118	60.8
	Female	76	39.2
Age	6-12	59	30.4
	13-18	102	52.6
	19-24	30	17.0
Grade level	Primary	116	59.8
	Middle	40	20.6
	Secondary	38	19.6

The above table shows the demographics of the respondents. Majority of the respondents were male (60.8%), while 39.2% of the respondents were females. Majority of the respondents

Data Collection

Data collection was done personally by the researcher from the chosen respondents in the Al Maktoum Special Education Centre, Islamabad. This was carried out by administering the research instrument to the participants, ensuring that each respondent understood the questions asked before answering them.

Data Analysis

The SPSS package was used in the analysis of data. Descriptive analysis involved the calculation of frequencies and percentages to measure the accessibility and use of audio aids by visually impaired students. Binary logistic regression was used to measure the influence of audio aids on learning performance of visually impaired students.

Results and Discussions

The data collected was subjected to analysis by SPSS – Statistical Package for the Social Sciences. The use of descriptive statistics such as frequency distributions and percentages was used to describe the demography of the participants and investigate the accessibility and usage frequency of audio aids. Binary logistic regression analysis was used to ascertain the influence of audio aids on learning achievement among visually impaired learners.

(52.6%) were in the age group 13–18 years, while 30.4% were in the age group 6–12 years and 17.0% were in the age group 19–24 years. The grade levels of the respondents showed that the

majority were from the primary level (59.8%).

Table 4.2: Availability of Audio Aids for Visually Impaired Students

Statement	Yes		No	
	f	%	f	%
Audio learning materials (like recorded lessons) are available for visually impaired students.	180	92.8	14	7.2
Audio textbooks or recorded syllabus content are provided.	102	52.6	92	47.4
Teachers are trained to use audio aids for visually impaired students.	184	94.8	10	5.2
Classroom lessons are delivered using audio aids.	99	51.0	95	49.0
10 Special software for audio-based learning is available.	154	79.4	40	20.6
Audio aids are regularly maintained and updated.	138	71.1	56	28.9

The following table highlights the provision of audio aids to visually impaired students. According to the results of the study, a vast majority of the respondents stated the provision of audio learning material (92.8%), as well as training of teachers in using audio aids (94.8%).

In addition, the majority of respondents indicated the provision of special software for audio learning (79.4%), as well as the maintenance and update of audio aids (71.1%). However, audio books/recorded syllabus content (52.6%) and the usage of audio aids in teaching lessons (51.0%) were provided comparatively less often.

Table 4.3: Frequency of Usage of Audio Aids in Learning Process

Statement	Yes		No	
	f	%	f	%
Audio aids are frequently utilized during study sessions.	71	36.6	123	63.4
Audio-based lessons are regularly included in classroom teaching activities.	68	35.1	126	64.9
Audio learning materials are accessed on a daily basis.	55	28.4	139	71.6
Teachers actively promote and encourage the consistent use of audio aids.	171	88.1	23	11.9
Audio aids form an integral part of the regular classroom teaching plan.	60	30.9	134	69.1
Audio aids are applied across a wide range of school subjects.	163	84.0	31	16.0

This table shows how often audio aid was used in the learning process. From the data collected, it is evident that teachers highly promoted the use of audio aids (88.1%) and the use of audio aids took place in a variety of school subjects (84.0%). However, the regular use of audio aids while

studying (36.6%), audio aid use in classroom teaching process (35.1%), everyday availability of audio learning materials (28.4%), and incorporation of audio aids in the classroom teaching process (30.9%) was noted to occur at relatively low rates.

Table 4.4: *Binary Logistic Regression.*

Chi-square	df	Sig	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
48.432	3	.000	146.276	.221	.349
48.432	3	.000			
48.432	3	.000			

Variables	B	S.E	Wald	df	sig	Exp(B)
Gender of respondents	-0.094	0.448	0.044	1	0.883	0.910
Age of respondents	-0.045	0.091	0.245	1	0.620	0.956
Grading	-1.489	0.333	20.023	1	0.000	0.226

This is the table showing the output of the binary logistic regression test. The whole model was found to be statistically significant ($\chi^2 = 48.432$, $df = 3$, $p < .001$), meaning that the independent variables as a whole contributed to the variation of

the dependent variable. The amount of variation that was contributed by the model was 22.1% (Cox & Snell R^2) and 34.9% (Nagelkerke R^2). Out of all the predictors, grade level was the only significant predictor ($B = -1.489$, $p < .001$, $Exp(B) = 0.226$), while gender and age were not.

Findings

- The study consisted of 194 respondents, out of which the majority were male (60.8%) and females constituted 39.2%.
- The highest number of respondents (52.6%) was found in the age category of 13–18 years, 30.4% in the age group 6–12 years, and 17.0% in the age group 19–24 years.
- The highest percentage of respondents (59.8%) were found in the primary level, followed by the middle level (20.6%) and secondary level (19.6%).
- A large proportion of respondents were provided with audio learning materials (92.8%) and teachers having training (94.8%) in their respective schools.
- More than the half respondents also confirmed the availability of special software for auditory learning (79.4%) and maintenance and updating of audio aids (71.1%).
- A smaller number of respondents had access to audio textbooks/syllabus (52.6%) and audio aids in classroom teaching (51.0%).
- Teachers motivated the use of audio aids (88.1%), and audio aids were used in all subjects taught at schools (84.0%).

- Notwithstanding the teacher's help, there was poor use of audio technology in learning activities such as study time (36.6%), classroom instruction (35.1%), daily learning activities (28.4%), and integration of audio in the normal instruction process (30.9%).
- The binary logistic regression analysis showed significance ($\chi^2 = 48.432$, $p < .001$), meaning that the chosen predictors significantly predicted the outcome variable.
- The analysis accounted for 22.1% to 34.9% of the variance of the outcome variable, based on the Cox & Snell R^2 and Nagelkerke R^2 .
- Grade was the only significant predictor of the outcome variable ($p < .001$), while gender and age were not statistically significant predictors ($p > .05$).

Summary

The study investigated the availability and use of audio aids by students with visual impairments and determined the variables related to the learning outcomes. It was found that there was an abundance of audio learning resources, trained teachers, and audio learning software among school settings. Nevertheless, the usage of audio aids during the classroom lessons, daily learning activities, and curriculum delivery was low

despite teacher support. Binary logistic regression analysis demonstrated that the model was statistically significant as a whole, and the only significant predictor of the variable under consideration was the grade level; whereas, the age and gender had no statistically significant effect on the variable. On the whole, the results obtained indicate that although the availability of audio aids is satisfactory, much attention should be paid to their effective use in the classroom environment.

Conclusion and Recommendations

It is evident from the findings that audio aids are readily available in school settings to the visually-impaired learners; however, their integration in the classroom setting and activities is minimal. Although there are tendencies among teachers to recommend audio aids for visual-impaired

learners, there is still a need for improvement in the use of such aids in instruction. The binary logistic regression revealed that only the grade level was the significant variable predicting the dependent variable, while gender and age were not.

It is advisable that efforts should be made to integrate audio aids into the learning activities within the classroom settings. Instructors need to receive continual training on how to make effective use of audio teaching techniques. There should also be provision of proper maintenance and updates of audio learning materials such as audio textbooks and audio learning software at schools. Policies to support sustainability of the use of audio aids should be put in place at school level.

Conflict of Interest

The authors showed no conflict of interest.

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