INFLUENCE OF ASSISTIVE TECHNOLOGY ON ACADEMIC PERFORMANCE OF STUDENTS WITH HEARING IMPAIRMENT IN CALABAR MUNICIPALITY, CROSS RIVER STATE, NIGERIA

Aderibigbe, Samson Akinwumi
aderibigbesamson2015@gmail.com
orcidid:0000-0002-8400-8047
+2348133032737

Ewa, Victoria Zake
zakyewa@gmail.com
orcidid:0000-0002-6635-1482

James, Daniel Daniel
Jdaniel176@yahoo.com
Orcidid:0000-0002-8147-6472

Udoh, Michael Ben
mikkylong2@gmail.com

Department of Special Education
Faculty of Educational Foundation Studies
University of Calabar, Calabar

Abstract

This paper examined the influence of assistive technology on academic performance of students with hearing impairment in Calabar Municipality, Cross River State. Three research questions were posed while descriptive survey research design was adopted for the study. Sixty students were purposively selected as sample of the study. The instrument used for data collection was a self structured questionnaire titled: "Influence of Assistive Technology on Academic Performance Questionnaire (IATAPQ)". The data collected were analyzed using simple percentages. Result showed that the application of assistive technology in lessons delivery makes teaching effective and it enhances academic performance of students with hearing impairment. Also, the results revealed that teachers do not make use of assistive technology as a result of unavailability in the school settings. Based on the findings, it was recommended that the government at all levels, philanthropist, NGOs and other stakeholders in education should donate and provide funds for the acquisition of appropriate and adequate assistive technological devices for use by teachers in the classroom in order to enhance the academic performance of students with hearing impairment. In addition, local assistive technology devices should be developed within the local environment to reduce cost.

Keywords: Influence, hearing impairment, assistive technology, academic performance

Introduction

Hearing impairment is a hidden disability because of its invisibility nature unlike other types of disabilities such as visual impairment or physical impairment which are easily identified. Hearing impairment is a condition where an individual is having deficiency or

impairment in processing linguistic information through auditory organs (IDEA, 2004). A child who is deaf cannot use organ of hearing to understand speech through the ears (Isaiah & Aderibigbe, 2012). The negative effects of hearing impairment on the child is enormous (Isaiah and Aderibigbe, 2013).

Suffice to say that in human development, hearing is an important factor in social and academic life (Ntino, Aderibigbe James, Abang & Agana 2021). The efficacy of every strategy depends on some other attributes or variables associated to individuals. Consequently, utilization of education as a variable tool must be embraced for ameliorating this disadvantage. According to Aderibigbe, Ajayi and James (2016), there is need for more resources, improvising or innovations to be put in place to compensate for this educational lag.

Studies assessing the academic performance of students with hearing impairment have found them to lag behind their hearing peers. In addition, the education policy and programmes are mostly tailored to accommodate children without special needs (Aderibigbe, 2015). Furthermore, Aderibigbe, James and Essien (2016) noted that the inability to hear have negative consequences on the education of students with hearing impairment. Nevertheless, education is widely recognized as a means to develop human capital and improve academic performance (Aderibigbe Egaga & James, 2016). Educating students with hearing impairment poses challenges to both families and professionals at homes and in schools.

The utilization of assistive technology is indispensable (Liman, Adebisi Jerry & Adewale, 2015). Modern assistive technologies are innovative technologies that modify or adapt the classroom for special learning needs. Students with hearing impairment require assistive technology to participate in and benefit from educational programmes. A range of technology solutions is available to support the students with hearing impairment (Aderibigbe, Ongbonya & James, 2014). ICT and assistive technology are basic tools in the provision of quality education for learners with hearing impairment to fit into the contemporary society (Aderibigbe Ajayi & James, 2016).

Assistive technology (AT) devices are said to be any item, piece of equipment or product system, whether acquired commercially at the shelf, modified and or customized that is used to increase, maintain and improve the functional capabilities of the individuals with hearing impairment in order to bring out the best in them. Simply put AT could also be said to be devices which aid in teaching and facilitating understanding in the students with hearing impairment. Aderibigbe & James (2017)

Assistive technology devices are classified into low and high tech. low tech assistive technology devices are simple tools that make life's daily activities easier (Raskind, 2008). These devices are non electronic and relatively inexpensive. They may be as simple as pencil grips to help students with hearing impairment with motor problem. High technology assistive technology devices on the other hand are generally electronic devices which are usually tied to power supply. Some examples of high tech AT devices for students with hearing impairment in the inclusive classroom include; hearing aids, computers, talking clocks alerting devices (Beard, Carpenter & Johnson, 2011). Robitalle (2011) observed that Assistive Technology (AT) devices are so important to learners with hearing impairment because these devices can help improve the physical and mental functioning and also the capacity of the individuals with hearing impairment to learn.

Ojogwu (2013) carried out a study on the significance of educational technology; a need for promoting the teaching and learning of persons with hearing impairment in Nigeria. The findings revealed that employing the use of assistive technology devices in the classroom setting significantly helped students with hearing impairment in understanding abstract concepts. He also found that the use of assistive technology devices significantly increase independence and active participation of students with hearing impairment in the teaching and learning process. In addition, the use of AT devices encouraged self-exploration as it gives opportunities for students

with hearing impairment to demonstrate their learning through the use of technology device for optimal functioning.

In a related development, Agba, Olayi and Ewa (2010) carried out a study on the opinion on the availability and use of assistive technology devices among special needs persons in Nigeria, and the result revealed that assistive technology devices commonly used by the students with hearing impairment in the inclusive education setting in Nigeria are the hearing aids and cell phones. The study showed further that some of the challenges affecting the effective use of assistive technology devices to include absence of legislation making it compulsory for the government at all levels and stakeholders in the education of the students with hearing impairment to provide assistive technology devices for students with hearing impairment in the school at all levels. Also, poor inaccessibility to internet facilities, inconsistent power supply; inadequate/ absence of technical knowledge on the use of assistive technology devices. Other challenges include poor/ lack of maintenance culture on the part of the students, parents and school authority. Furthermore, all assistive technology devices are foreign based, hence the high cost of importation and maintenance. Similarly, Goni and Nkwoagba (2013) discovered from their study on the need for assistive technology for special needs persons in Nigeria; that assistive technology devices will improve the learning and achievement of special need persons.

Statement of the problem

The perceived poor academic performance poses a huge problem, not only to the government, but also to the individuals themselves because many students with hearing impairment have dropped out of school. This inadvertently affects the manpower supply to the country and also poses a security challenge to the society, as they may become nuisance to the society. Furthermore, the poor academic performance may be attributed to; lack of assistive technology devices, high cost of assistive technology equipment, non-utilization and ineffective usage of assistive technology among others by teachers in lesson delivery for students with hearing impairment. It is against this backdrop that the researcher examined the influence of assistive technology in enhancing academic performance of students with hearing impairment in Calabar metropolis.

Purpose of the study

1. To examine the effectiveness of assistive technology in enhancing academic performance of students with hearing impairment.
2. To ascertain if there are enough assistive technology in educational institution for students with hearing impairment.
3. To find out if teachers make use of assistive technology in lesson delivery.

Research questions

1. To what extent is assistive technology effective in enhancing academic performance of students with hearing impairment?
2. To what extent is assistive technology available in educational constitution?
3. To what extent does teacher make use of assistive technology in lesion delivery?

Methodology

The research design used for this study was survey research design. The population of the study comprised 60 students with hearing impairment in Special Education Center, Ibom Layout, Calabar. The sample of the was made up of sixty (60) students with hearing impairment purposively selected for the study. The instrument used for data collection was a structured questionnaire titled: Influence of Assistive Technology on Academic Performance Questionnaire (IATEAPQ) developed by the researchers The questionnaire used likert scale format which was graded Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). The

questionnaire was divided into two section 'A' and 'B'. Section A consisted of information concerning bio-data of the respondents while Section B contained information that sought opinion in regards to some issues relating to the effect of assistive technology in enhancing academic performance for students with hearing impairment in special education centre, Ibom Layout, Calabar. The researcher obtained permission from the principal of the school to carry out the research on the students. After permission was granted, the researcher consulted the class teachers to acquaint them with the purpose of the research work in order to guarantee their maximum support. Before the administration of the instrument, the students were equally given proper instruction and their supports were also sought for the responding to the questionnaire. To validate the instrument, the researcher ensured that the items on the questionnaire correspond with the objectives of the study in order to ascertain the face and content validity of the instrument. To achieve this purpose, the researcher used 5 experts, three in special education and two in measurement and evaluation. In order to determine the reliability of the instrument, the researcher carried out a pilot study and data obtained were computed using Cronbach Alpha method. The internal consistency of the instrument was found to be 0.71.Data obtained were analyzed using descriptive statistics frequency count and simple percentage.

Results

Research question one

To what extent is assistive technology effective in enhancing academic performance of students with hearing impairment?

Table 1: Responses on application of assistive technology effectiveness in enhancing academic performance of students with hearing impairment

S/N	Items	A	SA	D	SD	Total Respondents	Total %
1.	Assistive technology is affective in enhancing academic performance of students with hearing impairment	26= 43.3%	22= 36.6%	06= 10%	06= 10%	60	100%
2.	Assistive technology helps in your understanding of lessons more	20= 33.3%	28= 47.0%	12= 20%	0= 0%	60	100%
3.	Assistive technology makes learning comfortable	22= 37.0%	20= 33.3%	16= 27.0%	02= 3.33%	60	100%
4.	Do you show less interest when lessons are taught without assistive technology?	16= 27.0%	16= 27.0%	22= 37.0%	06= 10%	60	100%

In the table 1 above, 26 or 43.3% of the respondents in item 1 agreed that assistive technology is effective in enhancing academic performance of students with hearing impairment while 22 or 36.6% of the respondents strongly agreed. 6 or 10% of the respondents disagreed, the same percentage of 6 (10%) strongly disagree. In item 2, 20 (33.3%) agreed that assistive technology helps in understanding of lesson note; 28 (47.0%) strongly agreed. However, 12 (20%) of the respondents disagreed and 0 (0%) strongly disagree. Results of the respondents in item 3 revealed that 22 (37.0%) agreed that assistive technology makes learning comfortable and 20 (33.3%) strongly agreed. Similarly, 16 (27.0%) of the respondents disagreed while 2 (3.33%) strongly disagreed. In item 4, 16 (27.0%) of the respondents show less interest when lessons are taught without assistive technology; 16 (27.0%) strongly agreed while 22 (37.0%) and 6 (10%) indicated disagreed and strongly disagreed respectively. From the above results, it can be deduced that assistive technology application during lesson delivery makes teaching effective.

Research question two
To what extent is assistive technology available in educational constitution?

Table 2: Responses on sufficiency of assistive technologies in educational institutions

S/N	Items	A	SA	D	SD	Total Resp.	Total %
1.	Assistive technology are available for delivery	6= 10%	10= 17.0%	16= 27.0%	28= 47.0%	60	100
2.	Assistive technology are very expensive to purchase	22= 37.0%	18= 30%	10= 17.0%	10= 17.0%	60	100
3.	Assistive technology easily breaks down	16= 27.0%	10= 17.0%	28= 47.0%	06= 10%	60	100
4.	Assistive technology maintenance and personnel are difficult to get	20= 33.3%	14= 23.3%	14= 23.3%	12= 20%	60	100

From table 2, it can be deduced that in item 1, 6(10%) of the respondents agreed that assistive technologies are available for lessons delivery while 10(17.0%) strongly agreed. 16(27.0%) of the respondents and 28(47.0%) indicated disagreed and strongly disagreed respectively. Item 2 results showed that 22 (37.0%) respondents and 18 (30%) revealed agreed and strongly agreed while 10 (17.0%) and 10(17.0%) indicated disagreed and strongly disagreed. Item 3 results indicated 16(27.0%) agreed and 10(17.0%) disagreed that assistive technology easily breakdown. In addition, 28(47.0%) and 6(10%) of the respondents disagreed and strongly disagreed respectively. Lastly, in item 4 results 20 (33.3%) and 14(23.3%) indicated agreed and strongly agreed that assistive technology maintenance and personnel are difficult to get. Also, 14(23.3%) and 12(20%) disagreed and strongly disagreed in their responses respectively. It can be deduced from the above results that there is insufficient assistive technology for effective learning.

Research question three: To what extent does teacher make use of assistive technology in lesion delivery?

Table 3: Responses on utilization of assistive technology in lessons delivery

S/N	Items	A	SA	D	SD	Total Resp.	Total %
1.	Teachers are competent in using assistive technology in lesson delivery	24= 40%	20=33.3%	16= 26.6%	0	60	100%
2.	Teachers make little use of assistive technology in teaching	34= 56.6%	16= 26.6%	6= 10%	2= 6.6%	60	100%
3.	Many teachers are poorly trained in handling assistive technology in teaching	24= 40%	18= 30%	16= 26.6%	3.3%	60	100%
4.	Teachers who used assistive technology deliver lesson better than those who do not	14= 26.6%	16= 60%	8= 13.3%	2= 33%	60	100%

The above table 3 showed 24(40%) of the respondents agreed that teachers are competent in using assistive technology in lessons delivery while 20(33.3%) strongly agreed. Also, 16(26.6%) and 0(0%) disagreed and strongly disagreed. Results in item 2, revealed that 34(56.6%) of the respondents make use of assistive technology in teaching while 16 (26.6%) of the respondents strongly agreed. Similarly, 6 (110%) and 2 (2.6%) disagreed and strongly disagreed respectively. In item 3, the results showed that 14 (40%) and 18 (30%) agreed and strongly agreed that many teachers are properly trained in handling assistive technology in teaching, other respondents 16 (26.6%) disagreed while 2 (3.3%) strongly disagreed. Lastly, results in item 4 showed 14 (6.6%) of the respondents agreed and 16 (60%) strongly disagreed that teachers who used assistive technology delivers lesson better than those who do not 8 (13.3%) and 2 (3.3%) disagreed and strongly disagreed respectively. The analysis of the results indicated that students with hearing impairment prefer teachers who make use of assistive technology when teaching.

Discussion

The finding of the study on research question one revealed that application of assistive technology by teachers was effective in enhancing academic performance of students with hearing impairment. The finding is in line with the assertion of Robitale (2011) that Assistive Technology (AT) devices are so effective in enhancing academic performance of learners with hearing impairment because these devices can help improve the physical and mental functioning and overall performance. Furthermore, Hennessey, Harrison & Wamakole (2020), reported that bringing technological devices into the classroom can have considerable impact on the practice of teachers in general and the students in particular.

The finding on research question two revealed insufficiency of assistive technology in educational institution. The finding is in consonant with that of Ekpoh and Etor (2012) who opined that infrastructure in the form of internet, computer, interactive video equipment, multi-media projectors, power-point projectors and so on when made available sufficiently will enable knowledge integration. Similarly, Hadjithome (2021) stressed that the benefit of technological devices in teaching and learning when available cannot be over emphasized. In the same vein, according to Aderibigbe and James (2017) assistive technology offers a great potential to support lifelong learning for students with hearing impairment. Nevertheless, the idea of using technology to function effectively for students with hearing impairment includes availability and focus on the teacher's integration of the technology into the learning environment and its impact on students learning outcomes.

The finding of the study on research question three showed that teachers do not make use of assistive technology in lessons delivery for students with hearing impairment. The finding is in consonant with that of Goni and Nkwoagba (2013) who discovered from their study that assistive technology devices will improve the learning and achievement of special needs persons when utilized. In addition, Aderibigbe, Abang & James (2017) concluded from their study that those teachers who happened to integrate technology in their previous teaching experience were more inclined to utilize technology in their institution compared to those who were less experience and those who do not utilize it.

Conclusion

The significance of assistive technology in teaching and learning process cannot be overemphasized. One of the challenges faced by the students with hearing impairment in learning is that of language and communication difficulties associated with the loss of hearing. Consequently, the effectiveness, availability and utilization of assistive technology become paramount and highly needed in proffering solutions to their learning needs.

Recommendations

Based on the findings, the following recommendations are made:

i. Teachers should make use of assistive technology in lessons delivery for students with hearing impairment
ii. Government at all levels, philanthropists, NGOs and other stakeholders in education should donate and provide funds for the acquisition of appropriate and adequate assistive technology devices for use by teachers in the classroom in order to enhance the academic performance of students with hearing impairment.
iii. Local assistive technology devices should be developed within the local environment to reduce cost.

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