VOL. 12 NO. 8,
MAY, 2026
E-ISSN 3026-8893
P-ISSN 3027-1061

African Scholar Publications & Research International
www.africanscholarpub.com

Journal of Education Research and Library Practice (JERLP)

Analyzing the Impacts of Developed Handicapped-Based Assistive Software on Students with Learning Disabilities

Abdulrauff, M. F.[1]; Adegbiji, A. T.[2]; Adeleke, I. A.; [3] & Adegoke, T. B.[4]

[1,2 &3]Department of Data Science, Informatics and Computer Science, Emmanuel Alayande University of Education, Oyo. [4]Department of Software Engineering, University of Greater Manchester, Greater Manchester, United Kingdom.
Corresponding Author: abdulrauffmf@eauedoyo.edu.ng
DOI: https://doi.org/10.70382/ajerlp.v12i8.091

Abstract

Several assistive software have been developed to empower handicapped-students in order for them to engage adequately with educational contents by participating fully in classroom activities and eventually achieve academic success like their peer groups who are not suffering from any learning disability. This paper considered the impacts of most of these developed assistive software on those with learning impairments in enhancing their learning accessibility. Three hypotheses were raised with twenty-one (21) questionnaires and two hundred and thirty five (235) respondents as means of gathering the needed data about the engagement of these assistive software among the disabled students in our institutions of learning to discover their learning proficiency. The data collected were an64nalysedsing chi-square as a statistical tool which revealed that the embracement of these apps have yielded outstanding academic success because they have assisted in allowing these students with learning disabilities to fully participate in classroom activities and educational contents with improved learning proficiency in their respective areas of study.

Keywords: assistive software, handicapped-students, educational contents, classroom activities and academic success.

Introduction

People with different learning impairments are increasing these days. No one can precisely and actually say the reasons for such impairments challenge incremental. This has thus called for the intervention of scientific researchers in the development of handicapped-based software, commonly known as Assistive Technology (AT). This AT is made up of digital tools designed to help individuals with physical, sensory, or cognitive disabilities to be able to live, work, and even learn more independently as the case may be. Assistive technology will assist those with hearing impairments to benefit greatly through the usage of computers and the internet since so much contact online is text based (Richard, 2024). According to Kayange (2024), productivity software is essential for everyone, including those with disabilities because such tools can empower users to enhance their efficiency, manage tasks, and communicate effectively. Thus, for individuals with disabilities, productivity software can bridge gaps in accessibility and functionality. These tools not only facilitate daily tasks but also promote independence and confidence. According to World Health Organisation (WHO), technology can significantly improve the quality of life for people with disabilities by removing barriers and enhancing communication capabilities. It enhances individual's functioning related to cognition, hearing, and vision, among other things, which in turn supports their well-being, inclusion and participation. This author discovered five innovations which are; Firstly, Flick-Type which is an innovative mobile keyboard application specifically created to assist individuals with visual impairments in their typing tasks. It is particularly advantageous for individuals who find traditional keyboard layouts challenging to use due to their visual limitations. This app transforms the typing experience by enabling users to input text quickly and efficiently through simple taps on the screen, thereby eliminating the need for precise letter placement. It incorporates advanced predictive text technology, which intelligently suggests words even if the letters are entered inaccurately or in the wrong order. This feature allows users to type with greater speed and confidence, significantly enhancing their overall communication experience.

Assistive Touch is another innovative software solution designed to enhance the independence of individuals with disabilities, making it easier for them to navigate their devices. Available on both Android and iOS, Assistive Touch introduces a virtual home button that significantly simplifies the process of using smartphones and tablets for those with physical disabilities. Assistive Touch allows users, especially those with upper-body limb differences, to perform actions easily without relying on physical buttons. Instead of traditional button interactions, Assistive Touch supports a variety of hand gestures. This technology extends beyond just smartphones; it is also integrated with the Apple Watch, enabling users to manage apps and notifications without needing to rely on physical buttons, thereby fostering greater autonomy and accessibility.

Another one according to Kayange (2024) is Google Voice Access which is an innovative

hands-free tool designed to empower users by allowing them to control their devices solely through voice commands. This feature is particularly beneficial for individuals facing mobility challenges, as it enables them to interact with their smartphones or tablets without the need for physical touch. With Voice Access, users can easily navigate through apps, send text messages, make phone calls, and perform a wide range of tasks just by speaking. The tool recognizes a variety of commands, making it intuitive and straightforward to use. For instance, users can open applications, scroll through content, and even dictate voice messages with remarkable ease.

Fourth type is Microsoft Seeing AI which is a cutting-edge application designed specifically for individuals with visual impairments, offering a range of features that enhance their daily experiences. This innovative tool provides audio descriptions of the surrounding environment, helping users navigate their world more effectively. With its text recognition capabilities, Seeing AI can read printed material aloud, whether it's a book, a sign, or a document, enabling users to access information that would otherwise be challenging to obtain. The app also includes product identification functionality, allowing users to scan barcodes and receive spoken information about various products, facilitating a more independent shopping experience. Additionally, Seeing AI features facial recognition technology, which helps users to identify and remember people by providing verbal cues about who is in front of them, fostering social interactions and connections. This versatile app is designed for everyday use, making it an invaluable companion for those with visual impairments. Users can easily download Seeing AI from its dedicated website, gaining access to a powerful tool that enhances accessibility and enriches their daily lives.

Finally, Kayange (2024) mentioned Brain in Hand is a specialized application designed to support individuals with autism and various neuro-divergent conditions in managing their daily tasks and emotional well-being. This innovative tool incorporates several key features aimed at enhancing the quality of life for its users. One of its standout components is mood tracking, which allows users to monitor and reflect on their emotional states throughout the day. This feature empowers individuals to identify patterns in their moods, helping them understand triggers and better navigate challenging situations. Voice control accessibility software includes programs that convert Speech to Text, and also allow you to command the computer with your voice. One of the most well-known and feature-rich web accessibility software programs is Dragon. (Andy, 2024). Jackson (2024) mentioned the various AT software that had assisted in training disabled students which are; Text to Speech, Reading Pens, Voice Recognition, Digital Recorders, iPads and Tablet, Electronic Spell Checkers, Word Prediction Software, Visual Search Engines, Literacy Specific Software, Educational Software and Electronic Resources and Books. Camilla (2025) recognized the following handicapped –based software as popular software for the use of trainers who are disabled; Screen reader which is a program that reads aloud the text and elements on a computer or smartphone screen, making the interface navigable and understandable for those who cannot see. Augmentative and alternative communication (AAC) which is an approach that uses

symbols, pictures, customized keyboards, and text-to-speech to support or replace verbal communication in those who cannot speak, using software such as *Proloquo2Go*, *Avaz AAC*, *LetMeTalk*, *TD Snap,* and *Tobii Dynavox Communicator 5*. Word prediction is another software with feature built into some writing software, such as *WordQ+SpeakQ*, that automatically suggests words as you type, making it easier for those with motor or speech difficulties. Eye tracking technology that detects eye movement and transforms it into commands for interacting with a device; it is the basis of *eye pointers* such as *Dialog 3.0*, *Grid 3* , and *Matrix AAC* . Speech recognition is a system that transforms your voice into text or digital commands, allowing you to type or control your computer without using your hands (e.g., *Dragon NaturallySpeaking* , *Windows Voice Access* , *Apple Voice Control*) .
Kayange (2024) thereafter suggested that when selecting productivity software, the following features should be considered viz; (i). Accessibility: Ensure compatibility with screen readers and other assistive technologies. (ii). Customisation: Look for options that allow users to tailor the interface to their needs. (iii) Ease of Use: Intuitive design is crucial for quick adaptation. (iv) Support for Collaboration: Tools that enable teamwork can enhance productivity.

Statement of the Problem

Students with learning disabilities as a result of impairment are struggling with reading, writing and communication issues due to either visual impairment, hearing loss, mobility challenge or learning difficulties. This is therefore making them to battle with low academic performance. This has necessitated the development of various assistive software that will accommodate such learning disabilities for them to have access to learning materials in classroom activities that will change speech-to-text, vice-versa and as the case may be, depending on someone's learning impairment. Hence, the developed apps available in the classroom is expected to promote learning ability of the students with learning disability.

Research Hypotheses

- There is no significant relationship between the Implementation of handicapped-based assistive software and the improvement of the disabled students' learning performance.
- There is no significant relationship between lecturers' enthusiasm in the implementation of handicapped-based assistive software and the learning disabled students' academic performance.
- There is no significant relationship between the institutional endorsement of handicapped-based assistive software and the educational progression system.

Review of Related Work

Many researchers have worked on the design and implementation of handicapped-based software which is referred to as Assistive Software to help people with learning impairments which may be Cognitive Impairments and Learning Disabilities, Visual Impairments, Hearing

Disabilities, Motor and Dexterity Impairments. Borblik *et al* (2015) talked about the intellectual or development disabilities, (IDD) as a broader category of often lifelong disability that can be intellectual, physical, or both. And that people with such kind of disability have difficulties in carrying out one or more functions in their everyday life. The researchers now analyzed the existing IDD classifications and peculiarities of mobile software design for people with IDD based on these classifications. Then, the user interface design as one of the most important aspect of the development of mobile software for people with IDD is considered. Bonanno *et al* (2025) worked on Assistive Technologies for Individuals with a Disability from a Neurological Condition: A Narrative Review on the Multimodal Integration. In this paper, Neurological disorders (NDs) can derive from the combination of biological, genetic, and environmental factors (e.g., congenital abnormalities, infections, and traumatic injuries) that affect the central nervous system. NDs are a common cause of impaired mobility (i.e., muscle weakness, paralyses, spasticity), speech alterations (i.e., from aphasia to lack of communication), sensation (i.e., paresthesia, hypoesthesia, allodynia), and cognitive functioning (i.e., executive functions, memory, attention processes, etc.) (Kouzani *et al*, 2019; Lancioni *et al*, 2019). Among assistive technologies, an even more specific area has benefited from great attention and has undergone considerable expansion, and is that of digital assistive technology (Schneider *et al*, 2024). Hata *et al* (2023) researched on Assistive Technologies for Children with Disabilities in Inclusive and Special Schools in Indonesia with empirical study of the Indonesian context aims to rigorously examine availability and usage of AT for children with disabilities. They looked into the availability and use of AT for students with disabilities in schools in Indonesia and the ways teachers, schools, and local and national stakeholders work together to promote equitable and quality learning through AT for children with disabilities. Lorente *et al* (2024) examined assistive technologies for children with physical disabilities, addressing the pressing need to empower these individuals. It was made know that with about 240 million affected children worldwide, innovative solutions are essential for improving access to education, healthcare, and social inclusion. Batanero (2022) studied the systematic review of Assistive technology for the inclusion of students with disabilities. This implied that the writer reviewed several authors that had suggested the inclusion of Assistive technology in assisting the students with one disability or the other for the betterment of their educational performance. Bateni and Maki (2005) opined that Assistive devices for balance and mobility are full of benefits, demands, and adverse consequences. However, these assistive devices benefits and demands superceded the adverse consequences because many of these people with one impairment or the others could not survive without having such support. Zhang *et al* (2025) examined a research work on 'I Felt Like I Was in a Fishbowl": Lived Experience with Telepresence and Non-Visible Disabilities in Higher Education. Here, the researchers made it clear that Telepresence robots have increasingly been used in education contexts as a means of enhancing participation, enabling remote access for students who cannot physically attend classes due to a range of factors such as medical conditions, disabilities or temporary illness. Unlike traditional telepresence solutions such as

video conferencing, telepresence robots offer a more embodied and interactive experience, enabling users to move through physical spaces, express themselves through intonation and gesture, and engage socially with instructors and peers. Stauter (2019) considered the Assistive Technology for Literacy in Students with Physical Disabilities: A Systematic Review. The researcher reviewed systematically most of these technologies for literacy in students with physical disabilities such as partial or total blindness, hearing loss and other disabilities. This enabled them to decide on the right app that will assist such students to have academic improvement. Unicef (2021) found out that the world's nearly with the population of 240 million children living with disabilities are being denied basic rights. Thus, they should be catered for because what is good for the goose is good for the gander. These children should be looked into and consider them by making provision for them so that they also will benefit from education for all. Souza and Zorzal (2026) worked on Enhancing daily living through Extended Reality: a systematic literature review for disability support Disability and Rehabilitation: Assistive Technology. This enabled the people with impairment of various form to cope with their situation through rehabilitation and making the appropriate assistive devices available so that they also would be recognized in our society as God created beings that should be backed up even with their deficiencies.

Research Methodology

The study employed was a descriptive survey research design, which is well-suited for examining both large and small populations. This method involved selecting samples from the population to investigate the prevalence, distribution. The population for this study consisted of the students in Federal College of Education (Special), Oyo, in Oyo state. Sampling random technique was adopted, in which every student and lecturer has an equal chance of being selected. A **stratified random sampling technique** was employed as a method of selecting a total of **235 respondents.** The total number of respondents been 235 from Federal College of Education (Special), Oyo was based on the randomly selected departments. The tool for data collection was a structured questionnaire. For the purpose of data collection, the researcher visited schools and took permission from the head of the respective departments, before the questionnaire was administered to both the lecturers and students who were selected randomly as the respondents. This approach ensured a **high response rate,** with a 100% return of the distributed questionnaires. The collected responses were organized and prepared for analysis. Once all the data were collected, the responses were grouped according to paired variables addressing each research question. The analysis was carried out using **Chi-square statistical tool** and **descriptive statistics**, which helped to summarize and interpret the data clearly.

Table 1:

- **H_1:** There is no significant relationship between the Implementation of handicapped-based assistive software and the improvement of the disabled students' learning performance.

STATEMENTS	A	SA	D	SD
1	80	110	35	10
2	65	105	30	35
3	71	88	54	22
4	54	120	21	40
5	90	83	47	15
6	37	44	89	65
7	100	95	20	20
TOTAL	**497**	**645**	**296**	**207**

S/No		O	E	O – E	$(O - E)^2$	$\frac{(O-E)^2}{E}$
1	**SA**	91.67	58.75	32.92	1083.73	18.45
2	**A**	66.17	58.75	7.42	55.06	0.94
3	**SD**	31.17	58.75	-27.58	760.66	12.95
4	**D**	46	58.75	-12.75	162.56	2.77
$x^2 = 35.11$						

Df = (C-1) (R-1)
= (4-1) (7-1)
= (3) (6)
= 18

N	DF	Sign. Level	Chi-square (X^2)	Critical Value	Decision
235	15	0.05	35.11	28.87	Rejected

Looking at the table above, it can be observed that the chi-square value calculated which has the value of 35.11 is less than 28.87, the chi-tabulated at 0.05 level of significance. This shows that the hypothesis which states that there is no significant relationship between the Implementation of handicapped-based assistive software and the improvement of the disabled students' learning performance.
is rejected and the alternative hypothesis which states that there is a significant relationship between the Implementation of handicapped-based assistive software and the improvement of the disabled students' learning performance.
accepted.

Table 2: H_2: There is no significant relationship between lecturers' enthusiasm in the implementation of handicapped-based assistive software and the learning disabled students' academic performance.

STATEMENTS	A	SA	D	SD
1	59	85	56	35
2	80	102	23	30
3	90	125	8	12

STATEMENTS	A	SA	D	SD
4	67	130	20	18
5	83	90	25	37
6	32	45	60	98
7	81	99	23	32
TOTAL	**492**	**676**	**215**	**262**

S/No		O	E	O – E	$(O - E)^2$	$\frac{(O - E)^2}{E}$
1	**SA**	37.43	58.75	21.32	454.54	7.74
2	**A**	30.71	58.75	28.04	786.24	13.38
3	**SD**	96.57	58.75	37.82	1430.35	24.35
4	**D**	70.29	58.75	11.54	133.17	2.27
$x^2 = 47.74$						

Df = (C-1) (R-1)
= (4-1) (7-1)
= (3) (6)
= 18

N	DF	Sign. Level	Chi-square (X^2)	Critical Value	Decision
235	18	0.05	47.74	28.87	Rejected

Table 2 shows that chi-calculated of 47.74 is greater than the chi-tabulated value of 28.87 at 0.05
level of significance. It can thus be said that the null hypothesis (H_0) which says that there is no significant relationship between lecturers' enthusiasm in the implementation of handicapped-based assistive software and the learning disabled students' academic performance is rejected while the alternative hypothesis which state that there is significant relationship between lecturers' enthusiasm in the implementation of handicapped-based assistive software and the learning disabled students' academic performance is accepted.

Table 3: H_3: There is no significant relationship between the institutional endorsement of handicapped-based assistive software and the educational progression system.

STATEMENTS	A	SA	D	SD
1	39	141	25	30
2	71	89	29	46
3	70	60	43	62
4	62	85	51	37
5	90	83	37	25
6	98	66	39	32
7	85	72	23	55
TOTAL	**515**	**596**	**249**	**287**

S/No		O	E	O – E	$(O - E)^2$	$\frac{(O - E)^2}{E}$
1	**SA**	36.96	58.75	-21.79	474.62	8.21
2	**A**	27.17	58.75	-31.58	997.86	17.52
3	**SD**	28.88	58.75	-29.87	892.43	15.39
4	**D**	43.07	58.75	-15.68	245.75	4.20
$x^2 = 45.32$						

Df = (C-1) (R-1)
= (4-1) (7-1)
= (3) (6)
= 18

N	DF	Sign. Level	Chi-square (X^2)	Critical Value	Decision
235	18	0.05	45.32	28.87	Rejected

From the table above, it can be observed that the chi-calculated which has the value of 45.32 is less than 28.87, the chi-tabulated at 0.05 level of significance. This hence reveals that the null hypothesis which state there is no significant relationship between the institutional endorsement of handicapped-based assistive software and the educational progression system rejected hence, the alternative hypothesis which states that there is significant relationship between the institutional endorsement of handicapped-based assistive software and the educational progression system is accepted.

Discussion of Findings

Table 1 revealed that there is significant relationship between the implementation of handicapped-based assistive software and the improvement of the disabled students' learning performance. This implies that the implementation of handicapped based assistive software improve the students' academic capabilities, make learning easier for the students with learning disabilities, arises their interest in studying hard without considering their challenges because this would have removed inferiority complex. Finally, the introduction of handclapped based assistive software will make the disabled students have full accessibility to computer world like other students without learning disabilities.

Table 2 showed that there is significant relationship between lecturers' enthusiasm in the implementation of handicapped-based assistive software and the learning disabled students' academic performance. This implies that lecturers teaching disabled students should find the act of teaching easier with the handicapped based assistive software. They should also play a role in encouraging such disabled students by making the software that can easily be taught for the handicapped available. This will thus assist in embracing it with the teachers & students alike. This implementation of handicapped based assistive software will improve the number

of enrolment of student with learning disabilities which will increase the quality education in Nigeria.

Table 3 revealed that there is significant relationship between the institutional endorsement of handicapped-based assistive software and the educational progression system. This indicates that Handicapped based assistive software had added to the chances of achieving the educational set goals by and for the students with learning disabilities. Meanwhile, because the assistive software are available in the market and most of the institutions have discovered its relevance over Handicapped students, they then make every efforts to possess them for the training of such students with impairment challenges. Thus, such assistive software increases the students' level of assimilation in the class and give positive transformation to the educational systems.

Conclusion

Due to several developed handicapped assistive software which have been incorporated into the teaching and learning process of the students with learning disabilities, outstanding transformation have been recorded from students with learning impairments. This implied that the developed software removed their deficiencies and their challenges had been catered for which resulted to learning proficiency. Thus, many of disabled students that would have become liability either to the government or their family are now contributing productively to our society at large. The researchers therefore conclude by encouraging both the disabled students and their lecturers to embrace the introduction of handicapped based software in its totality as it keeps on motivating and pushing students with learning disabilities to love, wanting to study hard so as to attain the greater height they dreamt of in their educational career.

References

Andy, P. (2024). 7 Tech Tools To Help People With Disabilities Access the Web. October 24, 2024, https://www.acquia.com/blog/tools-web-accessibility-for-disability\

Batanero, F. J. (2022). "Assistive technology for the inclusion of students with disabilities: a systematic review." Educational technology research and development 70: 1-20.

Bateni, H. and Maki, B. E. (2005). "Assistive devices for balance and mobility: Benefits, demands, and adverse consequences." Archives of Physical Medicine and Rehabilitation 86(1): 134-145.

Borblk, J., Shabalina, O., Kultsova, M., Pidoprigora, A. and Romanenko, R. (2015). Assistive technology software for people with intellectual or development disabilities: Design of user interfaces for mobile applications. *6th International Conference on Information, Intelligence, Systems and Applications (IISA)*, Corfu, Greece, 2015, pp. 1-6, doi: 10.1109/IISA.2015.7387976

Bonanno, M. , Saracino, B., Ciancarelli, I., Panza , G., Manuli, A., Morone , G. and Calabrò, R. S. (2025). Assistive Technologies for Individuals with a Disability from a Neurological Condition: A Narrative Review on the Multimodal Integration. *Healthcare (Basel)*, 13(13):1580. doi: 10.3390/healthcare13131580

Camilla, M. (2025). Digital Productivity Software and Apps: The Best Assistive Technologies for People with Disabilities

Hata, Anna; Wang, Han; Yuwono, Joko and Nomura, Shinsaku. (2023). Assistive Technologies for Children with Disabilities in Inclusive and Special Schools in Indonesia. © World https://openknowledge.worldbank.org/entities/publication/c1aeabcd-fd2b-44dc-b320-0c34da2c4d51

Jackson, T. (2024). 11 Assistive Technologies to support people with Disabilities https://www.bairesdev.com/blog/software-support-people-with-disabilities/

Kayange, G.M. (2024). Five Top Productivity Software for Users with Disabilities https://www.linkedin.com/pulse/five-top-productivity-software-users-disabilities-kayange-rfkof

Kouzani A.Z., Sillitoe R.V. Medical Devices in Neurology. In: Narayan R., editor. Encyclopedia of Biomedical Engineering. Elsevier; Oxford, UK: 2019. pp. 409–413.

Lorente, B.,Martínez, L. P. Ruiz Penichet V. M. and, Lozano Pérez M. D. (2024). Assistive Technologies for Children with Physical Disabilities: a Systematic Literature Review. Interacción '24: Proceedings of the XXIV International Conference on Human Computer Interaction 20, Pages 1 – 10. https://doi.org/10.1145/3657242.3658595

Lancioni G.E., Olivetti Belardinelli M., Singh N.N., O'Reilly M.F., Sigafoos J. and Alberti G. (2019). Recent Technology-Aided Programs to Support Adaptive Responses, Functional Activities, and Leisure and Communication in People with Significant Disabilities. Front. Neurol. 2019;10:643. doi: 10.3389/fneur.2019.00643. [DOI] [PMC free article] [PubMed

Richards, L. (2025). Mapcon Maintenance Software Article Series. Computer and Software Accessibility for the Disabled. Educational Outreach Writer https://www.mapcon.com/us-en/computer-and-software-accessibility-for-the-disabled

Schneider, C., Nißen, M., Kowatsch, T. and Vinay, R. (2024). Impact of Digital Assistive Technologies on the Quality of Life for People with Dementia: A Scoping Review. BMJ Open. 2024;14:e080545. doi: 10.1136/bmjopen-2023-080545. [DOI] [PMC free article] [PubMed]

Stauter, D. (2019). "Assistive Technology for Literacy in Students With Physical Disabilities: A Systematic Review." Journal of Special Education Technology 34: 016264341986825.

Souza, C. and Zorzal, L. E.(2026). Enhancing daily living through Extended Reality: a systematic literature review for disability support Disability and Rehabilitation: Assistive Technology10.1080/17483107.2026.2664018(1-20) Online publication date: 8-May-2026 https://doi.org/10.1080/17483107.2026.2664018

UNICEF (2021). "The world's nearly 240 million children living with disabilities are being denied basic rights – UNICEF." Retrieved March, 2024, from https://www.unicef.org/kosovoprogramme/press-releases/worlds-nearly-240-million-children-living-disabilities-are-being-denied-basic-rights.

Zhang, H., Feng, Y., Walker, A. and Rode, J. (2025)."I Felt Like I Was in a Fishbowl": Lived Experience with Telepresence and Non-Visible Disabilities in Higher EducationProceedings of the 27th International ACM SIGACCESS Conference on Computers and Accessibility10.1145/3663547.3746363(1-15)Online publication date: 26-Oct-2025. https://dl.acm.org/doi/10.1145/3663547.3746363