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Use of Mobile Device as An Assistive Technology for Learning Among Students with Special Needs

Ayodeji Obafami[1*], Ishola Ayodele Oluwaseun[2], Tolorunkele Adebayo[2],

[1,3]*Department of Educational Technology, Faculty of Education, University of Ilorin, Ilorin, Kwara State, Nigeria*

[2]*Department of Educational Foundations, Faculty of Education, Kogi State University, Anyigba, Nigeria*

Abstract

The aim of this study is to investigate the use of mobile device as an assistive technology for learning among students with special needs. Mobile technologies in the 21st century offer students' opportunities to enhance the learning process. But the lack of the use of mobile devices continues to submerge the learning process and performance of students with special needs. Thus, the study focused on the use of mobile devices as an assistive technology for learning among students with special needs. The study is the descriptive research of the survey type. Population for the study comprised all students of colleges of education in Oyo state. The target population for the study were all hearing impaired students of college of education special, Oyo. Random sample technique was used to select 210 students. Two research questions and one hypothesis were raised for the study. A researcher designed questionnaire was used for the study. The study data were analysed using frequency, percentage, mean and t-test to answer research questions and test the hypothesis. Findings of the study revealed that students with special needs use mobile devices, and also had positive attitude towards the use of mobile devices as an assistive technology for learning. The study therefore recommended among others, that students with special needs should be exposed to other technologies and mobile device features that could further assist the learning process of the students.

Keywords*: Mobile technology, Mobile devices, Assistive technology*

1. Introduction

Assistive technology (AT) can be described as any product whose primary purpose is to maintain or improve an individual's functioning and independence, thereby promoting the wellbeing of such individual with disabilities (Khasnabis & MacLachlan, 2015).

People with disabilities are otherwise referred to as people with special needs. Special needs or additional needs are used in clinical diagnostics and functional development to describe individuals who require assistance for disabilities that may be medical, mental or psychologically related. Special needs can range from autism, Asperger syndrome, cerebral palsy, down syndrome, dyslexia, dyspraxia, blindness, deafness and ADHD. So, for students, special need is a way to refer to students with disabilities, in which their learning may be altered or delayed compared to other students (Winzer, 2014).

Having said that, in the 21st century era of the proliferation of technology integration in education. One of the prominent concepts as far as technology and students with special needs are concerned is assistive technology. The clamour for the integration of this technology in the learning of special needs students is to help the students learning process more, especially in the face of shortage of sign language instructor. Assistive technology has the potential to improve functioning, reduce activity limitations, promote social inclusion, and increase participation in education, the labour market and civic life. Assistive technology contributes to enhancing disabled people's lives to become synonymous with empowerment, hope and encouragement that place those students in front of "real-world" experiences (Akpan & Beard, 2013). There are different disabilities, Assistive technology areas of intervention include physical impairments such as visual impairments, mobility impairment, deafness or hard of hearing and mental disabilities such as autism disorders, communication disorders and learning disabilities (Ismaili & Ibrahimi, 2016).

*) Corresponding Author
E-mail: ayodejiobafemi37@gmail.com

Although Assistive technology offers better learning experiences for some students with disabilities, it falls short of meeting the needs of a large number of cases due to several factors that undermine the learning outcomes to some extent. This is because, the design of some assistive technologies does not fulfil some requirements related to: usability, accessibility, flexibility, adaptability and ease of use among others. This guarantees freedom of movement between different locations inside and outside school (FernáNdez-LóPez, et al 2013). To this end, mobile learning, using smartphones are capable of providing alternative solutions to the learning process of students with special needs (Jalal ,et al 2017).

In addition, significant evidence suggests that mobile devices have the potential to offer students with disabilities more equitable education, which is one of the goals articulated by the United Nations Division for Social and Developmental Disability, (2006), Australian Disability Discrimination Act (DDA), (1992) and the Disability Standards for Education, (2005). In 'The ICT Opportunity for Disability-Inclusive Development Framework', (2013), it is noted that more "than any other ICTs in use today, mobile devices and services have by far the greatest impact on independent living for persons with disabilities" (Mayer & Young, 2017).

In the 21st century, the growing interest in pedagogical and instructional technologies has encouraged researchers in solutions that can foster and maximize the integration of special needs students within regular mixed classrooms. To this end, mobile devices, gadgets, smartphones, tablets and open source apps among others has proved to be efficient as practical learning alternatives for students with special needs (Shraples, et.al., 2009). Mobile devices provide easy and instantaneous access to learning for persons with disabilities. Mobile devices can be used by special needs students in a variety of ways, such as independent daily living and learning activities. Provision of hands-free capability, screen reading and text-to-speech functionality, relay services, Internet browsing, home automation, emergency response among others. In addition to enabling them perform tasks such as paying bills, shopping, booking tickets, reading books, working, and the impact it has on the social life of people living with one disability or the other (Narasimhan & Axel , 2012).

Without a doubt, the use of mobile devices is becoming ubiquitous by students in mainstream learning environments, thus the skills that are needed to access information, data and knowledge they can deliver are vital for providing inclusion in mainstream culture. Exclusion from these devices puts the non-user at a disadvantage and less able to access education and training, nor other range of benefits, support, social status and democratic representation (Hayhoe, 2013). Despite the increasing importance of mobile devices to learning, little attention has been placed on its capacity to assist students with disability learning process better than what it is. According to, Foley and Masingila, (2014), the use of mobile devices for students with visual impairments, provides such students with access to education, the means to participate in everyday life and the opportunity to create a community of practice. Comparatively, Jalal, Ibrahim and Ouazzani, (2017) investigated the potentials of using smartphones and tablets as alternative learning device in formal and informal learning environments. The study revealed that google play medical apps were of more relevance to cases of physical as well as mental disabilities, namely hearing impairment, visual impairment, autism and speech articulation disorders. While, Huang, Liao, Huang and Chen, (2014) study indicated that mobile learning does not only encourage students' interaction but also increases their success rate. Chu, (2014), on the other hand, emphasized that mobile learning has negative effect on academic achievement because of cognitive overload and inappropriate design of learning.

Similarly, Hayhoe, (2015) proposed a model of inclusive technical capital, and its use in the evaluation of technology and education designed to include students with disabilities. The role of mainstream mobile technologies and m-learning in the inclusion of students with disabilities were also examined. Findings revealed that mobile technology has advantages over traditional assistive technologies as a tool of inclusive technical capital. However, more needs to be done to develop tablets and smartphones' native features, settings and apps in order to consider the place of students with disabilities.

Having said that, the effective use of mobile device for learning is dependent on students mental or character disposition for learning otherwise known as attitude. Despite the efforts to provide adequate technology resources for teachers and students, little will be gained ultimately if knowledge and skills along with attitudes and beliefs are not addressed (Constantinescu , 2015). This is because; the attitudinal disposition of students with special needs towards the use of technology plays a central role in achieving a paradigm shift towards their learning process.

Thus, when students with special needs have a positive attitude towards mobile device as an assistive technology, there is the possibility of using it to enhance their learning and performance significantly. Conversely, when students have a negative attitude

towards any form of assistive technology, they tend to shy away from using such technology for learning (Onivehu et al 2017). Studies have also established close links between teachers' attitude and the use of ICT which could be one of the reasons for students' lack of use or positive attitude towards technological tools for learning (Yusuf & Balogun, 2011). In the study of Halder, Halder, and Guha, (2015), undergraduate students use of mobile phones; exploring use of advance technological aids for educational purpose, showed that undergraduate students perceived positively the use of mobile phones for educational purpose.

Similarly, Bikumalla, et.al., (2017) study revealed that, majority of students use smartphones for educational purposes. It was observed that students prefer to access information from online resources to library. And the students' attitude was found positive toward mobile learning. The students however, expressed that the use of smartphones should further be encouraged for educational purposes.

That said, the influence of gender on the use of mobile device as an assistive technology for students with special needs is considered to impact the student's perception of mobile devices usage for learning. Thus, Bikumalla , et.al., (2017) study showed that most students regardless of age or gender were owners of smartphones and were able users in both general and learning areas. In correspondence to this finding, Baiyun, et.al., (2015) revealed that smartphone ownership was prevalent among students regardless of demographic factors, but academic standing, age, and gender played a huge role in their use for learning. Halder, Halder, and Guha, (2015) study also showed that gender has a significant impact on tablet ownership, with female students owning more mobile devices than their male counterpart.

Based on the foregoing, one technological tool that helps the learning process of students with disabilities more is mobile devices. Especially in the face of shortage in special education teachers and sign language instructors, as well as other notable challenges. As a result, there is an urgent need to leverage on the use of mobile devices for learning among students with special needs. This is because, mobile devices create easy interaction options that offer more possibilities to learn than the traditional methods for the students. As it further motivates students to learn anywhere at any time. And engage students in the learning process, from being passive learners to truly engaged learners who are behaviourally, intellectually and emotionally involved in their learning process (Wang, Shen, Novak, & Pan, 2009).

Mobile technologies offer students with special needs an alternative means to learn and express themselves with easy-to-use mobile devices, gadgets or features. Mobile devices are therefore considered a form of assistive technology (AT) for students with special needs disabilities. However, the challenges confronting students with special needs centre largely on the lack of the use of technological devices and instructional strategies that considers varying degrees of students' disabilities. These challenges have however created a gap in motivating and engaging students in the learning process, as a result of which certain disabilities such as students' with hearing impairment find it hard to understand or learn to their maximum potential certain concepts or descriptions sign language interpreters may find hard or unable to relay to the students'. Based on the established problems militating against the learning process and potential of students with special needs, this study therefore, examined the use of mobile devices as an assistive technology for learning among students with special needs in Oyo, Nigeria. To achieve this, the study used a researcher designed questionnaire to determine the use and attitude of students with special needs. So as to determine whether, mobile devices can be used to improve students with special needs learning process and overall performance in Oyo, Nigeria.

2. Method

The study is a descriptive research design of the survey type. The study gathered quantitative data from the respondents. The entire population for this study included all students with special needs in Colleges of Education in Oyo State, Nigeria. The target population for the study was purposively determined to involve the college of education for special students, Oyo, Oyo state, Nigeria. The study focused on hearing impaired students as specific samples for the study. A total of 210 hearing impaired special students were randomly selected from the target population to participate in the study. A researcher-designed questionnaire was used to collect data for the study, in order to determine the use of mobile devices for learning among students with special needs. Microsoft Excel software was used to perform descriptive and inferential statistical analysis of data collected. Frequency, percentage and mean were used to analyse demographic characteristics of the respondents and to answer research questions, while t-test was used to test the study hypothesis at significant level of 0.05.

3. Result and Discussion

Out of the 210 sampled special needs students, 200 were actively involved in the study, and thus used for the study. The demographic characteristics of the respondents, gender: female constitute 104 (52.0%) of

the active respondents, while 96 (48.0%) were male. On the other hand, the year of study: 61 (30.5%) of the respondents were in year one, 78 (39.0%) of the respondents were in year two. While, 64 (32.0%) of the respondents were in year three. This shows that majority of the respondents were female and also mostly students in year two.

The use of mobile devices as an assistive technology for learning among students with special needs in college of education college special, Oyo. The study presents the highest percentage of result based on each question item. Question one result shows that majority of the respondents owned a mobile device with 180 (90.0%). However, most of the students do not use their mobile devices for picture/Icon communication with 90(45.0%). With 119 (59.5%) result, the students do not mobile devices for speech to text. Most of the respondents also do not use the internet to surf for materials with 106 (53.0%) result. 116 (58.0%) of the respondents asserted that mobile device helps them submit assignments quickly online.

Most of the respondents also noted that the use of mobile device helps them send sign language descriptions among peers and lecturers with 159 (70.5%). With 119 (59.5), the respondents alluded to using mobile devices to download course materials. Also, 97 (48.5%) believe mobile devices enhances their interest to learning. 120 (60.0%) noted that mobile devices enhance communication between lecturers and peers. 116 (58.0%) use mobile devices to view and do course presentation. While, 110 (55.0%) preferred to use mobile devices for study and research rather than the library. However, with 1249 (56.0%) grand total, implication of the result shows that, students with special needs use mobile devices for learning.

Students with special needs believed that mobile devices offer a range of communication channels that enhances interaction between lecturers, students and peers compared to sign language instruction. While the least mean score of 1.77 showed that some of the respondents still preferred sign language instruction than mobile devices as an assistive technology for learning. However, using 2.5 as bench mark, the implication of the grand mean score of 2.56, is that the respondents have positive attitude towards the use of mobile devices as an assistive technology for learning among students with special needs.

Result of the hypothesis tested which indicates that t (364) = .000, p = .000. The stated hypothesis was rejected therefore. This was as a result of the t-value of .00 resulting in .000 significance values which was less than 0.05 alpha values. By implication, the stated null hypothesis was not established.

Findings of this study show that students with special needs make use of mobile devices as an assistive technology for learning. This finding is line with Foley and Masingila, (2014) whose report indicated that the use of mobile devices among students with visual impairments, provides the students with access to education, means to participate in everyday life and the opportunity to create a community of practice. And also echoed Jalal, Ibrahim, and Ouazzani, (2017) study findings that google play medical apps were of more relevance to cases of physical as well as mental disabilities, namely hearing impairment, visual impairment, autism and speech articulation disorders.

Also, these findings showed that students with special needs had positive attitude towards the use of mobile devices as an assistive technology for learning. This finding agrees with Chandra, (2017) who found that students use smartphones for educational purposes. It was observed that students prefer to access information from online resources to library also, the students' attitude was however found positive toward mobile learning, and majority expressed that smartphone usage for educational purposes should be encouraged for learning.

Finally, this study hypothesis which was rejected because there was no significant difference in the attitude of male and female students with special needs towards the use of mobile devices as an assistive technology for learning. This result correlates with Halder, Halder, and Guha, (2015) study findings, that gender had a significant impact on tablet ownership, with female students owning more mobile devices than their male counterpart. However, in contrast with Bikumalla, et.al., (2017) whose study results showed that most students regardless of age or gender were owners of smartphones and were able users for learning and for other purposes.

4. Conclusion

The study examined the use of mobile devices as an assistive technology for learning among students with special needs in college of education, special, Oyo, Nigeria. So far, the reports showed that majority of the respondents make use of mobile device for learning. The students' attitude was also found positive towards the use of mobile devices as an assistive technology for learning. In addition, the study further revealed that there is a significant difference between male and female students with special needs towards the use of mobile device for learning as an assistive technology for learning.

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