



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

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### Abstract

Mobile technologies in the 21st century offer students' opportunities to enhance the learning process. This study focused on the use of mobile devices as an assistive technology for learning among students with special needs. The study is descriptive research of the survey type. The target population were all hearing impaired students of college of education special, Oyo. Random sampling technique was used to select 210 students. Two research questions and one hypothesis were raised for the study. A researcher designed questionnaire titled "use of mobile device as an assistive technology for learning" was used for the study. Data gathered was analysed using mean and t-test to answer research questions and test the hypothesis. Findings of the study showed that students with special needs use mobile device. The study recommended that students with special needs should more often use mobile devices as an assistive technology for learning.

**Keywords:** Mobile Technology, Mobile Devices, M-Learning, Assistive Technology.

### 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). However, since 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 & Ibrahim, 2016). Considering the ubiquitous nature of mobile technology and flexible features, mobile devices have the potential to offer students with disabilities more equitable education. This is one of the goals articulated by the United Nations Division for Social and Developmental Disability, Australian Disability Discrimination Act (DDA), and the Disability Standards for Education. In 'The ICT Opportunity for Disability-Inclusive Development Framework', 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).



## Literature Review

In the 21st century, the growing interest in pedagogical and instructional technologies has encouraged researchers in bringing 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 (Sharples, 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. 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. 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.

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.

### Purpose of the Study

The main purpose of this study was to investigate the use of mobile devices as an assistive technology for learning among students with special needs in Oyo, Nigeria. Specifically, the study:

1. examined the use of mobile devices as an assistive technology for learning among students with special needs in college of education special, Oyo;
2. investigated the attitude of special needs students towards the use of mobile devices as an assistive technology for learning in college of education special, Oyo; and
3. determined male and female students with special needs attitude towards the use of mobile devices as an assistive technology for learning in college of education special, Oyo.

### Research Question

The following research questions were answered in the study:

1. what is the use of mobile devices as an assistive technology for learning among students with special needs in college of education special, Oyo?
2. what is the attitude of students with special needs towards the use of mobile devices as an assistive technology for learning in college of education special, Oyo?

### Hypothesis

H<sub>01</sub>: there is 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 in college of education special, Oyo.

### Methodology

The study is a descriptive research design, using the quantitative method to gather 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 selected to include college of education for special students,

Oyo, Oyo state, Nigeria. The study focused on hearing impaired students as specific sample focus for the study. A total of 210 hearing impaired special students were randomly sampled from the target population, out of which 200 actively participated in the study.

A researcher-designed questionnaire titled “use of mobile device as an assistive technology for learning” was used to collect data for the study, in order to determine the use of mobile devices for learning among students with special needs. The instrument was validated by educational technology experts and lecturers of students with special needs for face and content validity respectively. A pilot study was conducted using 20 special needs students. Cronbach Alpha was used to determine the reliability coefficient of 0.65. Statistical Products and Services Solutions (SPSS) version 23.0 software was used to perform descriptive and inferential statistical analysis of data collected. Mean was used to answer research questions based on a 2.5 mean value benchmark, while *t*-test was used to test the study hypothesis at significant level of 0.05.

### Results

**Table 1: Demographic Characteristics of Respondents**

Gender	Frequency	(%)
Female	104	52.0
Male	96	48.0
<b>Total</b>	<b>200</b>	<b>100</b>
Year of Study	Frequency	(%)
Year 1	61	30.5
Year 2	76	38.0
Year 3	63	31.5
<b>Total</b>	<b>200</b>	<b>100</b>

Out of the 210 sampled special needs students, 200 were actively involved in the study, and thus used for the study. Therefore table 1 above shows 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, 76 (38.0%) of the respondents were in year two. While, 63 (31.5%) of the respondents were in year three. The implication of this is that majority of the respondents were female and the students were mostly sampled from year two.

**Table 2: Use of Mobile Devices as an Assistive Technology for Learning**

S/N	Items	Mean
1	I own a mobile device	3.20
2	I use mobile device for picture/Icon communication	2.30
3	I use mobile device for speech to text	2.76
4	I use mobile device to surf the internet for study materials	2.10
5	Using mobile devices for learnings helps me to submit my assignment promptly online.	3.10
6	I use mobile device to send and receive sign language descriptions with lecturers and students	3.25
7	I use mobile device for downloading and saving course materials for later use	2.90
8	Mobile device increases my interest for learning and understanding of new information	2.50
9	The use of mobile devices improve communication between student, teachers and peers	2.65
10	I use my mobile device for viewing course learning materials (Presentation, pdf, word, video and so on)	2.80
11	I prefer using your mobile device for study and research activities rather than using the library	2.95
<b>Grand Mean</b>		<b>2.77</b>

Table 2 above shows results of data gathered on the use of mobile devices as an assistive technology for learning among students with special needs in college of education college special, Oyo. Using a benchmark of 2.5 mean value, item one with a mean value of 3.20 shows that most of the respondents owned a mobile device. Item two 2.30 mean shows that most of the students do not use mobile device for picture or icon communication. Also, item three with 2.76 mean value, the respondents use mobile device for speech to text. For item four, 2.10 mean value also indicate that the respondents do not use the internet to surf for materials. Furthermore, with 3.10 mean value for item five, the respondents asserted that mobile devices help them submit assignments quickly online. Item six 3.25 mean value also shows that the respondents use mobile devices to send and receive

sign language descriptions to aid their learning process.

Also, item seven with 2.90 mean shows respondents use mobile devices to download and save course materials for later use. While, there is a balance of the respondents view with 2.50 mean value for item eight, that mobile devices increase their interest for learning and understanding of new information. With 2.65 mean for item nine, the respondents believed that mobile devices improve their communication process. Item ten 2.80 mean asserts to the respondents use of mobile device for viewing course learning materials. While, item eleven 2.95 value shows that most of the respondents preferred using mobile device for study and research activities. With 2.77 grand mean value, based on the benchmark of 2.5 mean value, the implication of this findings is that most students with special needs use mobile devices as an assistive technology for various learning process.

**Table 3: Attitude of Students with Special Needs Towards the Use of Mobile Device as an Assistive Technology for Learning**

S/N	Items	Mean
1	I believe mobile devices enhance access to learning materials	2.10
2	Mobile devices help me to study independently	2.82
3	I feel more comfortable using mobile devices as an alternative assistive technology for learning	2.75
4	I feel mobile device is very complicated and difficult to use	2.63
5	I prefer sign language than mobile devices as an assistive technology for learning	1.77
6	I don't think mobile devices are good for learning, it is more used for fun	2.51
7	I enjoy using mobile device as an assistive technology for learning	2.65
8	I enjoy mobile devices because it offers a wide range of communication channels useful to assist my learning	2.84
9	I am more used to sign language instructors than the use of mobile devices as an assistive technology	2.68
10	I like using mobile devices to stay	



informed and aware of new assistive technologies that enhances special needs students learning and communication	2.81
<b>Grand Mean</b>	<b>2.56</b>

Table 3 showed that item 8 has the highest mean value of 2.84, which means that students with special needs believed that mobile devices offer a wide range of communication channels useful to assist special need students learning. While the least mean score of 1.77 showed that some of the respondents do not prefer sign language instruction compared to 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.

**Table 4: t-test analysis of male and female students with special needs attitude towards the use of mobile devices as an assistive technology for learning**

Gender	No	$\bar{X}$	SD	Df	T	Sig. (2-tailed)
Male	104	2.94	.88	198	.000	.000
Female	96	2.53	1.00			.000
<b>Total</b>	<b>200</b>	<b>2.22</b>				

Table 4 shows result of the hypothesis tested, the result; df (198)  $t = .000$ ,  $p < 0.05$ . and with a 2-tailed significant value of .000 less than ( $<$ ) the 0.05 significant level benchmark. The result thus, means that the hypothesis which states that “there is 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” is not accepted. By implication, this means that “there is a 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.

**Discussion**

Findings of this study show that students with special needs make use of mobile devices as an assistive technology for learning. This finding is in 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. Also, Jalal, Ibrahim, and Ouazzani, (2017) study findings showed 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, this study 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 also observed that students prefer to access information from online resources to library, 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.

**Conclusions**

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 report 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.

### Recommendations

Based on this study finding, the researchers recommend that mobile devices should be used more as an assistive technology, in other to enhance the learning process of students with special needs. Also, students should be exposed to other form of technologies (hardware or software) and mobile device features that could further assist the learning process of students with special needs.

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