ASEAN Journal of Community and Special Needs Education

Journal homepage: https://ejournal.bumipublikasinusantara.id/index.php/ajcsne

Undergraduates with Special Needs' Awareness Towards the Use of Assistive Technology for Learning at The University Level

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ABSTRACTS

The use of assistive technology has been widely accepted in education to bridge the gap between special and regular schools. Its penetration has transformed teaching and learning across the curriculum. This study examines the awareness of students with special needs towards the use of assistive technology for learning at the university level. This type of research is descriptive with a survey method. The sample consisted of 25 students from the University of Ilorin who were distinguished by faculty, department, level, and study program. The data were analyzed using percentages and frequency counts to answer research questions 1 and 2, while ANOVA was used to test research hypotheses 1 and 2. The results showed that: students were aware of assistive technology for learning; students on average use assistive technology to learn; there is no significant difference in the level of awareness and use of assistive technology for student study program-based learning and this is reflected in the results with a significance value of 0.424 and 0.230 both tested at the same significance level $p>0.05$ This study concluded that students were aware and average average use assistive technology for learning. It is recommended that seminars and workshops should always be organized for students and lecturers on the use of emerging assistive technologies, and the Government should also include access to assistive technologies in education policies and programs.

ARTICLE INFO

Article History:
Submitted/Received 29 Dec 2021
First revised 11 Jan 2022
Accepted 04 Feb 2022
First available online 16 Feb 2022
Publication date 01 Mar 2022

Keyword:
Assistive technology,
Awareness,
Special needs,
Utilization.

1. INTRODUCTION

The world of education is currently undergoing a massive transformation as a result of the digital revolution. Because of this digital revolution, it is both important and practical to make use of the availability and accessibility of technology in designing educational or training programs. Technology has the potential to contribute to a better quality of life for students with intellectual disabilities, which is more than just a matter of convenience. Assistive technology can be defined as any item, piece of equipment, or product system, whether acquired commercially or off the shelf, modified or customized that is used to increase, maintain or improve functional capabilities of individuals with disabilities (Rashed *et al*, 2021).

The use of Assistive Technology to meet the individual differences of students with special needs cannot be undermined, if the general goal of education is to be achieved and in other not to leave any stone unturned. Assistive technologies are integrated into teaching and learning procedures to overcome the challenges faced by students with disabilities in educational institutions (Ekwere, 2020). Many assistive technology devices are available to assist teachers in improving the functional capabilities of their students by increasing their participation in learning opportunities and involvement in activities. Broadly describes impairment in a person's ability to function, caused by changes in various subsystems of the body, or to mental health. The degree of disability may range from mild to moderate, severe, or profound. A person may also have multiple disabilities. Conditions causing disability are classified by the medical community as inherited (genetically transmitted); congenital, meaning caused by a mother's infection or other diseases during pregnancy, embryonic or fetal developmental irregularities, or by injury during or soon after birth; acquired, such as conditions caused by illness or injury; or of unknown origi.

Disability covers impairments, activity limitations, and participation restrictions. Impairment is a problem in body function or structure; an activity limitation is a difficulty encountered by an individual in executing a task or action; while a participation restriction is a problem experienced by an individual in involvement in life situations. Thus, disability is a complex phenomenon, reflecting an interaction between features of a person 's body and features of the society in which he or she lives. An individual may also qualify as disabled if he/she has had impairment in the past or is seen as disabled based on a personal or group standard or norm. Such impairments may include physical, sensory, and cognitive or developmental disabilities. Mental disorders (also known as psychiatric or psychosocial disability) and various types of chronic disease may also qualify as disabilities.

goals of ICT for students with disability include giving disabled students a powerful tool in their battle to gain employment; increasing disabled students skills, confidence and self-esteem; integrating disabled students socially and economically into their communities; reducing the physical or functional and enlarging scope of activities available to disabled persons. Disability defines persons with impairments (blind or visually impaired, deaf or hard of hearing), learning disabilities, motor functioning problems, or neurological impairments. Assistive technology and accessible instructional materials are making a significant difference in the lives of many students with disabilities, expanding their learning opportunities. The main reason for providing Assistive Technology in schools is to enable students to achieve their academic goals. However, it is a worldwide challenge to develop policies, provisions, and procedures that influence the availability, accessibility, and selection of affordable high-quality assistive technology for the individuals who need it.

Assistive technology (AT) is a general term describing tools that are used to maintain or improve the functional abilities of a learner with a disability in all aspects of life. Assistive

DOI: http://dx.doi.org/10. 17509/xxxx.xxxx
p- ISSN 2775-8400 e- ISSN 2775-9857

technology ranges from low-tech devices that require little training and do not have complex features (e.g., magnifying glasses, large-print text, or crutches) to more advanced items like hearing aids, and high-tech devices or equipment such as communication devices and specialized computer software (Ahmad, 2014; Ahmad, 2015a; Ahmad, 2015b). According to the Individuals with Disabilities Education Improvement Act (IDEA) of 2004, an AT device is any equipment or system, purchased off the shelf commercially, customized, or specifically modified, to improve or maintain the functional capability of individuals with disabilities. Recently, AT has become an even more indispensable aid for individuals with different types and levels of disability because it increases students' access to the curriculum and improves the outcomes of the learning proces. Apart from enhancing academic achievement in mathematics, spelling, writing, and reading, assistive technology assists students in daily living by ameliorating social acceptance, improving organization, and enabling independence. This highlights the importance of assistive technology as learning technology to facilitate flexible learning in school settings.

The five key prepositions identified within The Convention on the Rights of Persons with Disabilities (CRPD), 2006 about the use of ICT in education include promotion of equity in educational opportunities at all levels of lifelong learning; access to appropriate ICT including assistive technologies to allow learners to reach their full potential; the training of educational staff to make use of ICT in educational settings; the promotion of research and development into the availability and use of new ICT; systematic data collection to identify and then monitor the implementation of minimum standards for ICT in education for people with disabilities. ICT to promote equity in educational opportunities, tencapsulates the essential purpose of using ICT in education for students with disabilities.

The use of ICT is not an end in itself; rather it is a means of supporting individual people 's learning opportunities. This means that learners with and without various disabilities and special needs should have their educational needs met within the same settings, the goal for inclusive education is to promote full participation and opportunities for all learners vulnerable to exclusion so that they can realize their poten. Within this CRPD preposition, the word equity implies something more than equal opportunities (or having access to the same opportunities to take part in educational activities as everyone else). Equity implies people 's individual needs being met. The condition in every type of inclusive education area cannot be successfully created without the appropriate ICT tools applied. Assistive tools should be used to allow students with disabilities to participate in the educational process based on special techniques and equipment. ICT can provide and/or support individualized access to learning opportunities.

Assistive technologies play an important role in equalizing opportunities for people with disabilities in several aspects of life as this technology enables them to overcome various limitations and obstacles faced in all types of environments. Thus, it becomes essential that schools provide opportunities for students to be fully aware and learn to operate in the information age we live in through the use of newer and more advanced technologies. Additionally, over the years there have been many technological advances in the underlying operating systems and application technologies specifically designed to assist students with disabilities in everyday life.

There are an increasing number of students with special needs in Nigerian higher institutions today, who study the course of their choice despite their disabilities. Technology has great potential in providing access for all learners, and the ability to access the general education curriculum. Assistive technology is a generic term that includes assistive, adaptive,

DOI: http://dx.doi.org/10.17509/xxxx.xxxx
p- ISSN 2775-8400 e- ISSN 2775-9857

and rehabilitative devices for individuals with disabilities and includes 'virtually anything that might be used to compensate for lack of certain abilities'.

The following research questions were raised to guide the conduct of this study:

(i) What is the level of awareness of undergraduates on the use of assistive technology for learning?
(ii) Do University of Ilorin undergraduates with special needs use assistive technology for learning?
(iii) The following hypotheses are postulated and tested in the study:
(iv) H01: there is no significant difference in the level of awareness of assistive technology for learning based on undergraduates' course of study.
(v) H02: there is no significant difference in the use of assistive technology for learning based on undergraduate students' course of study.

2. METHODS

The study adopted a descriptive research design of the survey type. This method allows the representation of phenomena as accurately and objectively as possible without necessary manipulating variables. A designed questionnaire was used to gather relevant information on the Undergraduates with Special Needs' Awareness towards the use of Assistive Technology for Learning in the University of Ilorin.

The population of this study was all special needs undergraduates in Nigeria. The target population was special needs undergraduates in the University of Ilorin. The purposive sampling technique was used to select the 25 special needs students from the total population of 25 students with special needs in the university.

2.1. Research Instruments

The research instrument was a designed questionnaire. It consists of three sections; section A contained the respondents' demographic information such as Faculty, Department, Level, and Course of Study. Section B was used to check the level of awareness of the use of assistive technology for learning by undergraduates with hearing disabilities on fourteen (14) items of assistive technologies, which were used to answer research questions 1. Fourteen (14) items presented in section C were used to answer research question 2. The items in section B were rated on Aware and not aware while those items in section C were rated on used, and not used.

2.2. Validity of the Instruments

In determining the face and content validity of the research instrument, the questionnaire was subjected to inspection and constructive criticism by the researchers' supervisor, and three other lecturers in the Department of Educational Technology, University of Ilorin. The importance of validating the instrument was to make the amendment, based on the comments of the validators.

2.3. Procedure for Data Collection

The researchers obtained a letter of introduction from the Department of Educational Technology, the University of Ilorin which was taken to the selected department. Permission was sought from relevant authorities of the sampled department. The researchers and the research assistant administered the questionnaire to the respondents after permission has been granted. The data were collected for further analysis immediately after they have been

DOI: http://dx.doi.org/10. 17509/xxxx.xxxx
p- ISSN 2775-8400 e- ISSN 2775-9857

adequately completed. Ethical consideration was maintained through the period of data collection. The researchers ensured that respondents were not coerced to fill out the questionnaire and respondents were allowed to participate voluntarily. Also, utmost confidentiality and secrecy of the respondents were maintained during the administration, collation, and report of research findings.

2.4. Data Analysis Techniques

The data obtained through the questionnaire was subjected to descriptive and inferential statistics. The descriptive analysis (percentage and mean) was used to answer the research questions. Hypotheses were tested using ANOVA. Data collected were coded and analyzed using Statistical Package for Social Science (SPSS). All hypotheses were tested at a 0.05 level of significance.

3. RESULTS AND DISCUSSION

3.1. Demographic Distribution of the Respondents

The distribution of respondents by faculty were shown in **Table 1**. Respondents from Education were 17 (68.0%), Management Sciences were 4 (16%) and Physical Sciences were 4 (16%). Results in **Table 2**, reveals that out of 25 sampled respondents in this study 4 of them were from the Department of Business Administration representing 16%, 4 were from the Department of Statistics representing 16%, 3 respondents were from the Department of Adult and Primary Education, 4 respondents from Department of Educational Management while 10 of the respondents are from Department Counselor Education representing 40%.

Table 1. Distribution of Respondents Based on Faculty.

Faculty	Frequency	Percentage (%)
Education	17	68
Management Sciences	4	16
Physical Sciences	4	16
Total	25	100

Table 2. Distribution of Respondents Based on Department.

Department	Frequency (%)	Percentage (%)
Business Administration	4	16
Statistic	4	16
Adult and Primary Education	3	12
Educational Management	4	16
Counselor Education	10	40
Total	25	100

From the data in **Table 3**, 3 (12%) of the respondents were in 100 level, 8 (32%) of the respondents were in 200 level, 5 (20%) of the respondents were in 300 level, 9 (36%) of the respondents were in 400 level. The distribution of respondents involved in this study according to the course of study shows that there was a difference in the distribution along the respondents' course of study. The results in **Table 4** show that 4 (16%) studied Business Administration, 4 (16%) Studied Statistic, 3 (12%) studied Adult and Primary Education, 4 (16%) respondents studied educational management, while 10(40%) of the respondents studied counselor education.

DOI: http://dx.doi.org/10.17509/xxxx.xxxx
p- ISSN 2775-8400 e- ISSN 2775-9857

Table 3. Distribution of Respondents Based on Level.

Level	Frequency	Percentage (%)
100	3	12
200	8	32
300	5	20
400	9	36
Total	25	100

Table 4. Distribution of Respondents Based on Course of Study.

Level	Frequency	Percentage (%)
100	3	12
200	8	32
300	5	20
400	9	36
Total	25	100

3.2. Research Question 1: What is the Level of Awareness of Undergraduates on the use of Assistive Technology for Learning?

Table 5 reveals that items 12 and 14, Computer and Projector have the highest awareness amongst undergraduate students with a frequency of 24 (96%) respectively followed by Electronic Hearing Aid 19 (76%) of the entire respondents. Telecommunication Device for the Deaf (TDD) has 17 (68%) of the respondents being aware of it while Typanometer, Audiometer, and Telephone/Sign Device has 12 (64%) respondents respectively that were aware of them. However, Amplification has the lowest awareness amongst the sampled undergraduate students with a frequency of 9 (36%). Also, with a low awareness level is Infrared System with 44% (11 respondents). In summary, of all the 14 listed Assistive Technologies, only three of them have a low awareness level which is less than 50% meaning that undergraduate students are aware of Assistive Technologies for learning.

Table 5. Undergraduate Awareness of Assistive Technology.

S/N	Equipment	Aware		Not Aware		Total	
		Frequency	(%)	Frequency	(%)	Frequency	(%)
1	Captioning	15	(60)	10	(40)	25	(100)
2	Electronic Hearing Aid	19	(76)	6	(24)	25	(100)
3	Signaling Device	13	(52)	12	(48)	25	(100)
4	Telecommunication Device for the Deaf (TDD)	17	(68)	8	(32)	25	(100)
5	Amplification	9	(36)	16	(64)	25	(100)
6	Motion Film	13	(52)	12	(48)	25	(100)
7	Typanometer	16	(64)	9	(36)	25	(100)

DOI: http://dx.doi.org/10. 17509/xxxx.xxxx
p- ISSN 2775-8400 e- ISSN 2775-9857

Table 5 (continue). Undergraduate Awareness of Assistive Technology.

S/N	Equipment	Aware		Not Aware		Total	
		Frequency	(%)	Frequency	(%)	Frequency	(%)
1	Captioning	15	(60)	10	(40)	25	(100)
2	Electronic Hearing Aid	19	(76)	6	(24)	25	(100)
3	Signaling Device	13	(52)	12	(48)	25	(100)
4	Telecommunication Device for the Deaf (TDD)	17	(68)	8	(32)	25	(100)
5	Amplification	9	(36)	16	(64)	25	(100)
6	Motion Film	13	(52)	12	(48)	25	(100)
7	Typanometer	16	(64)	9	(36)	25	(100)
8	Adapted Door Bell	12	(48)	13	(52)	25	(100)
9	Audiometer	16	(64)	9	(36)	25	(100)
10	Telephone/Sign Device	16	(64)	9	(36)	25	(100)
11	Alerting Devices	15	(60)	10	(40)	25	(100)
12	Computer	24	(96)	1	(4)	25	(100)
13	Infrared System	11	(44)	14	(56)	25	(100)
14	Projector	24	(96)	1	(4)	25	(100)

3.3. Research Question 2: Do Undergraduate Students use Assistive Technology for Learning?

Table 6 reveals that Computer has the highest frequency of usage amongst undergraduate students with 24 (96%) of the total respondents who use it while 1 (4%) of the respondents do not use it at all. Also, Projector has 23 (92%) of the respondents who use it while 2 (8%) do not use it at all. Alerting Devices has 17 (68%) of the entire respondents who use it, 8 (32%) who do not use it. In the same way, Telecommunication Device for the Deaf (TDD), Motion Film, and Audiometer has 16 (64%) of the entire respondents respectively use them, 9(36%) do not use them at all. However, Infrared System has the lowest usage amongst the sampled undergraduate students with a frequency of 6 (24%) respondents who use it, 19 (76%) who do not use it at all. Next to the lowest usage was Signaling Device 8 (32%) of the respondents use it, 17 (68%) do not use it. Conclusively, of all the listed Assistive Technologies, eight of them are used among the respondents while six of them are not being used at all.

DOI: http://dx.doi.org/10.17509/xxxx.xxxx
p- ISSN 2775-8400 e- ISSN 2775-9857

Table 6. Use of Assistive Technology by Undergraduate Students.

S/N	Equipment	Used		Not Used		Total	
		Frequency	(%)	Frequency	(%)	Frequency	(%)
1	Captioning	9	(36)	15	(60)	24	(96)
2	Electronic Hearing Aid	12	(48)	13	(52)	25	(100)
3	Signaling Device	8	(32)	17	(68)	25	(100)
4	Telecommunication Device for the Deaf (TDD)	16	(64)	8	(32)	24	(96)
5	Amplification	12	(48)	13	(52)	25	(100)
6	Motion Film	16	(64)	8	(32)	24	(96)
7	Typanometer	15	(60)	10	(40)	25	(100)
8	Adapted Door Bell	12	(48)	13	52)	25	(100)
9	Audiometer	16	(64)	9	(36)	25	(100)
10	Telephone/Sign Device	13	(52)	12	(48)	25	(100)
11	Alerting Devices	17	(68)	8	(32)	25	(100)
12	Computer	24	(96)	1	(4)	25	(100)
13	Infrared System	6	(24)	19	(76)	25	(100)
14	Projector	23	(92)	2	(8)	25	(100)

3.4. Hypotheses Testing Research Hypothesis 1: There is no significant difference in the level of awareness of assistive technology for learning based on undergraduate students' course of study.

As shown in **Table 7**, it can be concluded that there was no statistically significant difference in the level of awareness of assistive technology by undergraduate students based on the course of study. This was reflected in the result as the significant value .424 is greater than the alpha value .05. This, therefore, establishes the fact that there was no significant difference in the level of awareness of assistive technology for learning based on undergraduate students' course of study.

Table 7. ANOVA of Undergraduate Students' Awareness of Assistive Technology Based on Course of Study.

	Sum of Squares	df	Mean Square	F	Sig.	Remark
Between Groups	41.943	10	4.194	1.099	0.424	
Within Groups	53.417	14	3.815			**Accepted**
Total	95.360	24				

DOI: http://dx.doi.org/10. 17509/xxxx.xxxx
p- ISSN 2775-8400 e- ISSN 2775-9857

3.5. Hypotheses Testing Research Hypothesis 2: There is no significant difference in the use of assistive for learning based on undergraduate students' course of study.

As shown in **Table 8**, it can be concluded that there was no statistically significant difference in the use of assistive technology for learning by undergraduates with hearing disabilities based on the course of study. This was reflected in the result as the significant value .230 was greater than the alpha value .05. This, therefore, establishes the fact that there was no significant difference in the use of assistive technology for learning based on undergraduate students' course of study.

Table 8. ANOVA of Undergraduate Students' Use of Assistive Technology Based on Course of Study.

	Sum of Squares	df	Mean Square	F	Sig.	Remark
Between Groups	57.943	12	4.829	1.549	.230	
Within Groups	37.417	12	3.118			**Accepted**
Total	95.360	24				

3.6. Discussion

Research question one sought to find out the level of undergraduates' awareness of assistive technology for learning. The results showed that most of the respondents become aware of the use of assistive technologies that are capable of improving their performance and that can also enable them to carry out any given task in the classroom. The findings of the research further revealed that assistive technologies were averagely used for learning by undergraduates. Research hypothesis one stated that there was no significant difference in the level of awareness of assistive technology for learning based on undergraduates' course of study. The results also stated that there was no significant difference in the level of awareness of assistive technology based on students' course of study. It can therefore be said that the course of study does not influence students' awareness of assistive technology for learning. Research hypothesis two stated that there is no significant difference in the use of assistive technology for learning based on undergraduates' course of study. The findings showed no statistically significant difference in the use of assistive technology for learning by undergraduates with hearing disabilities based on the course of study. This, therefore, establishes the fact that there was no significant difference in the use of assistive technology for learning based on undergraduates' course of study.

Assistive technologies serve as a product, devices, or equipment that are used to maintain, increase or improve the functional capabilities of people with disabilities with ease. This implies that students use assistive technologies for their learning. Moreover, assistive technology devices are needed for effective learning outcomes and provision should be made in virtually all learning centers for easy access. Assistive technology is one of the key elements to advancing inclusion of people with disabilities in combination with other supports such as personal assistance, sign language interpreters, and barrier removal; meaning that, use of assistive technology and accessible technology for people with disabilities is critical for many to access and benefit from education.

DOI: http://dx.doi.org/10.17509/xxxx.xxxx
p- ISSN 2775-8400 e- ISSN 2775-9857

4. CONCLUSION

The research examined Undergraduates with Special Needs' Awareness towards the Use of Assistive Technology for Learning at the University of Ilorin. The results obtained from the data gathered and analyzed in this study indicated that undergraduate students' awareness of the use of assistive technology was moderate. From the findings, it can be deduced that assistive technologies help students maximize their potential and ability to achieve their educational objectives. This shows that students use Computer, Projector, Alerting Devices, Motion Film, and Typanometer as types of assistive technology indispensable as they require less stress and it enhances productivity in their learning. It can be deduced that the use of assistive technology is one of the key elements to advancing the inclusion of people with disabilities. Thus, the proper inculcation of assistive technology in our educational system should not be neglected to bring about effective and productive education. This study, therefore, recommended that seminars and workshops should always be organized for students and lecturers on the use of emergent assistive technology; and Government should also include access to assistive technology in the education policy and programs.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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DOI: http://dx.doi.org/10. 17509/xxxx.xxxx
p- ISSN 2775-8400 e- ISSN 2775-9857