European Journal of Special Education Research
ISSN: 2501 - 2428
ISSN-L: 2501 - 2428
Available on-line at: www.oapub.org/edu

doi: 10.5281/zenodo.3352228 Volume 4 | Issue 4 | 2019

AN APPRAISAL OF THE COMPUTING KNOWLEDGE AND SKILLS OF STUDENTS WITH DISABILITIES IN THE UNIVERSITY OF EDUCATION, WINNEBA, GHANA

Ephraim Quaynor Teye[1],
Adam Awini[2],
Alice Avornyo[3],
Nana Opoku Acheampong[4i]
[1]Department of ICT Education
University of Education, Winneba, Ghana
[2]Dr., Department of Special Education,
University of Education, Winneba, Ghana
[3]Department of Special Education,
University of Education, Winneba, Ghana
[4]Department of Special Education,
University of Education, Winneba, Ghana

Abstract:
The study examined the knowledge and skills in using computers by students with disabilities at the University of Education, Winneba (UEW). The study employed the descriptive survey design which used a questionnaire to solicit information from forty-six (46) students who were randomly sampled. The study found out that majority of the students had some knowledge and skills in the use of computers. However, it was established from the results, that many of the students' knowledge and skills about computers were inadequate for higher education level academic work. Finally, the study found out that the type of disability a person has, does not have any significant influence on their knowledge and skills for computer usage. It was recommended that students with disabilities should have access to specialized Information and Communication Technology (ICT) centre where adaptive services would be organized and delivered to enhance their skills. This ICT centre should be manned by competent ICT personnel who understand the needs of students with disabilities, and whose main responsibilities should be to attend to the technological needs of students with disabilities.

Keywords: computing knowledge, computing skills, ICT, students with disabilities

[i] Correspondence: email opokunana22@gmail.com

1. Introduction

Computers play a significant role in almost all academic programmes and careers, and students who are knowledgeable about computers and possess skills for computer usage are more likely to be successful. Computers are powerful tools for extending educational opportunities to students in any educational system. Over the years, computers have enabled changes in the way students acquire knowledge and have facilitated communication, and increased access to information (Fraillon, Schulz, & Ainley, 2013). Computers have broadened the horizons of students and enhanced the independence of students with disabilities. Students who are blind can access academic materials just like their sighted peers. This is because there are many hardware and software products such as built-in operating systems functionality, voice recognition systems, and switches that assist students who have difficulties using computers at school and at home (Drescher, 2009).

These new technologies hold great promise for the education of students with disabilities. Nonetheless, the computer revolution has not completely removed barriers faced by students with disabilities (Kaye, 2000). Traditionally, access to, and use of computers by students with disabilities has been difficult for several reasons. Chief among these reasons is the students' incompetence in using computers, which results from their lack of, or inadequate practical knowledge and skills in using computers (Bordbar, 2010; Peralta & Costa, 2007). A considerable amount of research has been conducted on knowledge and skills for computer usage. The context of such studies have been about teachers (Beaula & Raja, 2012; Lawrence & Veena, 2011); students (Yusuf & Balogun, 2011); and other professionals in the educational sector (McCannon & O'Neal, 2003).

However, despite the abundance of literature on how computers have changed the live of students with disabilities in a number of ways, it appears there is a dearth of studies that seeks to find out the computer competency of students with disabilities. Through conversation with some of these students at the University of Education, Winneba, it appeared that the scope of their knowledge about computers is somewhat limited. This, to some extent, has resulted in the lack of basic computer skills such as starting or shutting down a computer, launching computer applications, creating, naming, and renaming files and folders, and sending and receiving emails. This lack of computing skills has led to limited computer usage experience. These observations seem to be consistent with other problems encountered by researchers elsewhere, including Bordbar (2010) and Peralta and Costa (2007), who observed that inadequate computer knowledge and skills affect computer competency. The outcome of the observation shows that students with disabilities have low levels of computer competency, although there is no scientific proof to support this perception. It is in this regard that this study has been conducted to examine the computer knowledge and skills of students with disabilities.

2. Literature Review

Literature was reviewed on the major themes of the research objectives. It specifically focused on students' knowledge in computing, as well as the skills they have in using computers.

2.1 Computing knowledge of students

A principle that emerged from research which compared the performance of experts and novices, and from research on learning and transfer into practice, established that to develop competency in an area, learners must have strong foundational knowledge and be able to organize that knowledge in ways that facilitate the information retrieval and application (Bransford, Brown, & Cocking, 2000). Applying this concept to computer competency, Oliver (2000) argued that students must possess a wide variety of computer knowledge for both academic and career successes.

The idea that possessing knowledge about computers enables a person to become competent in computer usage has been upheld in literature for a long time, with many studies investigating the subject background of students and its effect on their knowledge about computers. Wallace (1999) investigated factors that influenced the development of computer competency with students from two different academic disciplines involving computing and education. The researcher reported that students with a computing background were more competent in computer usage, because of their higher computer knowledge. Similarly, Wu and Yeh (2012) surveyed students from three different disciplines – Chinese literature, sociology, and computer science and found out that computer science students were more confident to master competencies than students of other subject fields. This result is because computer science students spent longer hours on the internet, and more heavily depend on the internet and computers, and therefore, are more computer literate because of the content knowledge. This outcome suggests that people who are knowledgeable about computers will be more competent in using computers, when compared to other people with little knowledge about computers. Also, the study of Tella (2009) found out that the specific discipline of students affected their information seeking behaviour, and ultimately, their computer knowledge and competency. These outcomes support the opinion that students who have some computing knowledge tend to be much more competent in its application than those with very little knowledge.

The importance of providing training to help students in their computer usage is undeniable. Yu, Kim and Roh's (2001) survey on the relationship between technology training and computer competency revealed that the lack of knowledge about computers created anxiety on its users. They advised that knowledge about computers and the World Wide Web should be made available to students, because increases in knowledge and familiarity with computers is important for computer usage. This viewpoint advocates the need for the provision of instruction on computer literacy for students. The basis for this advocacy is that it will enable students to become active

users of computers, thereby taking full advantage and making good use of the vast majority of computer technology in the 21st century for students with disabilities. This point agrees with Edwards, Portman and Bethea's (2012) position that students' computer competency improves upon their completion of an introduction to ICT course, suggesting that higher knowledge about computers correspond to increased performance and greater achievement of computer competency.

2.2 Students' skills for using computers

Higher education generally requires students to have basic computer skills to undertake activities such as information search, submission of assignments and communication. Students, however, have a variety of computer competencies depending on the type and/or quality of their computer skills. It has been shown that lack of skills may cause a delay in learning or increase frustration among students (Elder & Koehn, 2009). For this reason, basic computer skills are highly required in order for students to survive in higher education (De Wit, Heerwegh, & Verhoeven, 2012). This requirement is consistent with the viewpoint of Ademodi and Adepoju (2009) as well as Masood, Khan, and Waheed (2010) who have noted that competence in computer usage requires the acquisition of basic computer skills, and recommended computer training for users. This training should however be tailored towards developing ICT skills which will be useful in the various career paths of the users (Itsekor & Ugwunna, 2014; Manir, 2011).

Also, Buabeng-Andoh (2012) contends that users' competence in using computers relates directly to their level of confidence and perception of their skills. Similarly, some studies have revealed that the low level of computer competence and usage is mainly as a result of low levels of computer skills (Danner & Pessu, 2013; Ozoemelem, 2010). These outcomes suggest that the attainment of computer competency, to a large extent, is influenced by the computing skills of an individual, confirming the opinion of Khalid, Nawawi and Roslan (2009), whose survey on the conditions that have influenced the use of ICT in secondary schools in Malaysia, reported that computing knowledge and skills of users influenced the decisions to implement educational technology innovations.

2.3 Purpose of the study

The concern and focus of this study was to examine the knowledge and skills of university students with disabilities. This is because all students of the University of Education, Winneba study an introductory course in ICT. Considering that they learn about computers and ICT to acquire some fundamental knowledge and skills for computer usage, it is necessary to find out the outcome of the ICT course on their knowledge and skills for computer usage, and to determine its effect on their computer literacy and application. In relation to these objectives the following research questions were raised to guide the study:

1) What knowledge do students with disabilities in the University of Education, Winneba have regarding computers?

2) What skills do students with disabilities have in using computers for their higher academic activities in the University of Education, Winneba?

In addition, the following hypotheses were raised to guide the study:

H_{01}: There is no statistically significant difference in the computing knowledge for students with hearing impairments and those with visual impairments**.**

H_{11}: Students with hearing impairment are more knowledgeable about computers than those with visual impairments.

H_{02}: There is no statistically significant difference in the computing skills of students with hearing impairments and those with visual impairments**.**

H_{12}: Students with hearing impairment possess more skills for using computers than those with visual impairments.

3. Material and Methods

3.1 Research Design

A cross-sectional survey design was adopted for the study. As explained by Cohen, Manion and Morrison (2007), this design enables researchers to collect data from selected individuals at a particular point in time, knowing that such information can change later. The cross-sectional survey design was adopted because it provided a framework for the researchers to collect data at just one point in time from a sample that has been drawn from a predetermined population, to find out specific characteristics of the larger group (Fraenkel & Wallen, 2000; Owens, 2002). Another reason for the choice of this design is because it provided all the participants with same questions, which made measurement more precise, and eliminated the possibility of the researchers' own biases and prejudices (Sincero, 2012).

3.2 Population and Sample size

The population involved in this study was all undergraduate students with disabilities in the University of Education, Winneba. The total population for the study was 94 students. However, 46 participants, involving 21 students with hearing impairments and 25 students with visual impairments were sampled to participate in the study. The participants were further made up of 27 males and 19 females between the ages of 21 and 44 with an average age of 29.

3.3 Sampling Technique

The simple random sampling technique was used to select the participants for the study. To do this sampling, the population was first defined by listing the names of all participants in alphabetical order, with surnames first. Serial numbers were then assigned to each participants of the population. A random numbers table (adopted from Leedy & Ormrod, 2005, p. 200) was used to select the sample. To select an entry block within the table, a two-digit number was selected, after which a coin was tossed to determine which number to be used for selecting the row and the column within the

table. The intersection of the two numbers was therefore chosen as the entry block. All numbers in the block which were between 1 and 46, were picked. The same strategy was adopted in the other blocks, until a total of 46 numbers were picked from the table. A number which had been picked already from a block within the table was skipped in the subsequent blocks. This was done to ensure that every number had the opportunity of being selected only once. A comparison of the serial numbers of the population to the numbers picked from the random numbers table was done, to select the students whose serial numbers appeared in the list which was picked from the table. This strategy was used to ensure that pure chance dictated the choice of each participant for the study.

3.4 Instrument for Data Collection

A close-ended questionnaire in the form of a five-point likert-type scale was used to collect data from the participants. In order to ensure the reliability of the instrument, the questionnaire was first piloted with 12 students, and the data was used to conduct a reliability test. With the Cronbach's alpha value at 0.86, which is greater than the standard value of 0.80 accepted for social science research (Field, 2009; Hof, 2012), the instrument was confirmed to be reliable. Table 1 shows the result of the test of reliability of the questionnaire.

Table 1: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of Items	Number of Cases
0.861	0.860	13	12

Source: Result of SPSS Analysis (2018).

3.5 Procedure for Data collection

With permission from the participants, the questionnaire was administered personally to help improve the collection and response rate. The items in the questionnaire were explained to the participants to ensure that they understood clearly what the questions sought to find. In cases where the participants were gathered together at a central location, no communication between participants was allowed during the answering of the questionnaire. This was done to ensure that responses were not affected by views of persons other than the participant. The researchers collected the questionnaires as soon as it was completed. In other cases, the questionnaire was sent by email to some participants who preferred an online survey.

3.6 Data Analysis

The data collected were processed using SPSS version 21 for analysis. Descriptive and inferential statistics were used for the analysis of data. Simple percentages were used to organize and analyse the data. Also, the independent samples t-test was used to test the hypothesis for statistical significance, while the Pearson's product-moment correlation analysis was used to test the direction and strength of the relationships that exist between the computing knowledge and computing skills of the participants. In the

analysis of the data, and for the purposes of discussions, the two extremes of the responses to the questionnaire items were combined, such that the responses of Strongly Agree (SA) and Agree (A) were interpreted as having the same idea, whiles the responses to Strongly Disagree (DS) and Disagree (D) were also interpreted and considered as one.

4. Results and Discussions

Research Question 1: What knowledge do students with disabilities in the University of Education, Winneba have regarding computers?

To answer this research question, the frequency distributions and percentages of the opinions expressed by the participants were used. These items sought to address issues concerning the knowledge that students with disabilities have about computers. The responses are shown in Table 2.

Table 2: Knowledge about computers by students with disabilities (n=46)

Statement	Agree F (%)	Neutral F (%)	Disagree F (%)
1. I know how to start and shut down a computer	36 (78.3%)	9 (19.5%)	1 (2.2%)
2. I know how to open a computer program	24 (52.2%)	9 (19.5%)	13 (28.3%)
3. I know how to create a document with a computer	27 (58.7%)	6 (13.0%)	13 (28.3%)
4. I know how to send and receive an email	27 (58.7%)	0 (0.0%)	19 (41.3%)
5. I can identify various types of icons (file, folder, program) on a computer.	31 (67.4%)	6 (13.1%)	9 (19.5%)
6. I know how to download files from the internet	17 (37.0%)	9 (19.5%)	20 (43.5%)

Source: Field Data (2018)

Table 2 shows the frequency distribution of the participants' responses on their knowledge about computers.

After analysing the issues that formed the participants' computing knowledge, it was found out that knowledge on starting and shutting down a computer was high. About 78.3% of the participants indicated their knowledge on how to start and shut down a computer. Also, 52.2% pointed out that they know how to launch computer programmes, while 58.7% indicated they know how to create documents with a computer. Again, another 58.7% of the participants stated that they know how to send and receive emails. Further, 67.4% stated that they can identify and distinguish between various types of icons on a computer. However, the data analysis revealed that fewer participants (37.0%) have knowledge on how to download files from the Internet. These outcomes point to the fact that students with disabilities are benefitting from the introduction to ICT course which is taught by the Department of ICT. It implies that

when given the right instruction, students will acquire more knowledge which will lead to their attaining higher computer competency levels.

This outcome confirms an earlier study by Frimpong-Kwapong (2009) which found out that knowledge about computers and ICT was high among students, with 77.5% of those participants indicating that they knew about ICT. It is evident that the finding of this current study supports the view of Lambert, Gong and Cuper (2008) that students who rated themselves as more knowledgeable in technology were also more competent about using computers and believed that computers are useful tools. The phenomenon of computer knowledge resulting in competence is so because these students have some level of understanding of how the computer operates. Tella and Mutula (2008) have earlier stated that students who are computer literate are more inclined to using computers because of their appreciation of its usefulness to them.

Another major finding was that there was no statistically significant difference in knowledge possessed by the two groups of students (hearing impaired and visually impaired). This was revealed by the results of the independent samples t-test conducted to determine the difference in the mean scores of the two groups involved in the study. Table 3 shows the results of the independent samples t-test for hypothesis 1.

Table 3: T-test result for knowledge about computers

Type of Disability	Mean	SD	t	df	P-value
Students with visual impairments	3.37	0.72	0.882	44	0.38
Students with hearing impairments	3.59	0.93			

Source: Result of SPSS Analysis (2018).

From the result of the t-test, it was revealed that there was no statistically significant difference in the scores for students with visual impairments (M=3.37, SD=0.72) and students with hearing impairments [M=3.59, SD= 0.93; t (44) = 0.882, p = 0.38, > 0.05]. Therefore, the null hypothesis ($H_0 1$) was retained, thus rejecting the alternate hypothesis ($H_1 1$).

In order to find out whether the very marginal difference in the scores of the two categories of students occurred by chance, the magnitude of the differences in the mean values was calculated, using the Eta squared formula.

$$n^2 = \frac{t^2}{t^2+(N1+N2-2)}$$

$$n^2 = \frac{0.882^2}{0.882^2 + (25 + 21 - 2)}$$

$$n^2 = \frac{0.77}{0.77 + (25 + 21 - 2)}$$

$$n^2 = \frac{0.77}{44.77}$$

$$n^2 = 0.017$$

The test results showed that the difference in the mean values was very small (eta squared = 0.017), indicating that the nature or type of disability has a very small effect on the individual's computing knowledge. In other words, only 1.7% of the variance in students' computing knowledge is explained by the type of disability, implying that disability does not necessarily influence a person's computing knowledge as much as other factors do.

This finding agrees with the outcome of a study on technology skills assessment for deaf and hard of hearing students conducted by Luft, Bonello and Zirzow (2009). Their study found out that students' computer knowledge and skills depended on their access to technology rather than their disabilities. Also, it supports the finding by Power, Power, and Horstmanshof (2007), who investigated how much, and for what purposes hearing impaired people use communication technologies. Their study revealed that people with hearing impairments are knowledgeable about computers and other communication technologies, and are using them, regardless of their disability.

Again, these current findings confirm the outcome of a survey to evaluate a computer literacy programme for 25 students with various disabilities, including deaf-blindness, visual impairments and hearing impairments, conducted by Hozmi (2008). Hozmi noted that the students had some knowledge about computers, and further reported very high levels of student satisfaction for the programme, with a significant percentage of the students reporting a strong desire to further expand their knowledge about computers. It is evident from the results presented above that given the necessary support and materials, students with disabilities would be equipped with the requisite computing knowledge and other technologies that would help in their academic and professional careers.

Research Question 2: What skills do students with disabilities have in using computers for their higher academic activities in the University of Education, Winneba?

In answering Research Question 2, frequency distributions and percentages of the participants' views on the skills they possess for using computers were used. Table 4 highlights the responses from the participants.

Table 4: Skills for using computers by students with disabilities (n=46)

Statement	Agree	Neutral	Disagree
7. I can use Microsoft Office Word to type a document	22 (47.8)	7 (15.2)	17 (37.0%)
8. I can open more than one computer program at a time	17 (37.0%)	0 (0.0%)	29 (63.0%)
9. I can search for information on the internet	17 (37.0%)	0 (0.0%)	29 (63.0%)
10. I can send and receive an email	16 (34.8%)	9 (19.5%)	21 (45.7%)
11. I can create folders and organize files on a computer	31 (67.4%)	9 (19.5%)	6 (13.1%)
12. I can download and upload documents on the internet	17 (37.0%)	0 (0.0%)	29 (63.0%)
13. I can save documents on storage devices such as pen drives	26 (56.5%)	0 (0.0%)	20 (43.5%)

Source: Field Data (2018).

Table 4 shows the frequency distribution of responses to the items which sought to find information about the participants' skills for using computers.

From the analysis of the issues that covered the skillfulness of the participants, it emerged that 47.8% were of the view that they possessed the skills required to use Microsoft Office Word to type a document, as compared to 37.0% who disagreed. This outcome is so because most of the computer related activities performed by students involve word-processing activities. Therefore, by frequently doing such activities, the students have acquired the skills required in word-processing. When asked whether they can launch and run more than one computer programme at a time, 37.0% of participants noted that they possessed the skills required for multi-tasking, as compared to 63.0% who stated that they did not.

Again, on the issue of searching for information on the internet, most of the participants (63.0%) indicated that they could not search for information on the internet. This implies that they lacked the skills for browsing the internet. Also, on the issue of skills needed to send and receive emails, only 34.8% of the participants agreed that they had the skills required. Additionally, 63.0% of these participants have indicated that they lacked the skills for downloading and uploading documents on the internet. This finding is interesting, considering that 58.7% of the participants claimed to have knowledge on how to send and receive emails. The outcome confirms the opinion of Hilberg and Meiselwitz (2008) who noted that although students may seem familiar with the internet, they are less fluent than their perceptions, and cannot demonstrate foundational skills as required of them.

Additionally, the data analysis showed that 56.5% of the participants possessed skills in saving documents on storage devices such as pen drives, compared to 43.5% who stated that they do not have skills to perform such tasks. This outcome was so, perhaps because most of the activities which involve the task of saving documents to storage devices are related to word processing, which many of the participants

indicated that they could do. However, the opinions by the participants raise some fundamental issues concerning the correlation between knowledge and skills. Whereas previous studies suggested that computer knowledge and skills are positively correlated, and therefore assumed that knowledge will necessarily result in skills (Albion, 2007; Lambert, Gong, & Cuper, 2008), the findings of this study revealed that although many of the participants (56.5%) claimed to have computing knowledge, those who reported having the actual ability to perform activities with their skills were only 45.3%.

This finding implied that knowledge about a subject matter does not necessarily amount to skill in performing activities related to the subject; and agreed with the finding of Wallace and Clariana (2005) who noted that the assumption that possessing adequate knowledge of computer concepts would amount to possessing computer literacy skills is not accurate. Also, McDonald's (2004) assertion that it is inaccurate to assume that students' knowledge about computers would necessarily result in computing skills, was validated by this finding. The implication of this outcome is that real practical sessions must be organized for these students, so that their knowledge will be translated into skills which would lead to the attainment of higher levels of computer competency.

Also, it is important to note that effective strategies, including the provision of accessible computer facilities must be put in place. Pelgrum's (2001) position that the lack of accessibility to computers is a major barrier to the use of computers by students comes to mind and gives an indication that computing resources must be provided, if students are expected to acquire skills for using computer. However, as Bingimlas (2009) noted, the issue of accessibility is not only about the availability of computers. It has a lot to do with the quality of hardware, appropriateness of software, and the availability of qualified and competent teachers.

Furthermore, another major finding from the study was the fact that the difference in the skills possessed by the two groups of students was not statistically significant. Table 5 shows the results of the independent samples t-test for hypothesis 2.

Table 5: T-test result for Skills possessed for using computers

Type of Disability	Mean	SD	t	df	P-value
Students with visual impairments	2.84	0.88	0.590	43.8	0.56
Students with hearing impairments	3.02	1.12			

Source: Result of SPSS Analysis (2018).

Results from the independent samples t-test revealed that there was no statistically significant difference in the scores for students with visual impairments (M=2.84, SD=0.88) and students with hearing impairments [M=3.02, SD= 1.12; t (43.88) = 0.59, p = 0.56, > 0.05], indicating the fact that there is no difference in the computing skills of students with hearing impairments and students with visual impairments. Therefore, the null hypothesis ($H_0 2$) was retained, thus rejecting the alternate hypothesis ($H_1 2$). Also, the magnitude of the difference in the mean values of the two groups was also

calculated, using the Eta Squared formula, to determine the cause of the differences between two groups of students.

$$n^2 = \frac{t^2}{t^2 + (N1 + N2 - 2)}$$

$$n^2 = \frac{0.590^2}{0.590^2 + (25 + 21 - 2)}$$

$$n^2 = \frac{0.348}{0.348 + (25 + 21 - 2)}$$

$$n^2 = \frac{0.348}{45}$$

$$n^2 = 0.007$$

It was revealed that the difference in the mean values was very small (eta squared = 0.007), which suggests that disability does not play a role in determining how skilful a person may be in using computers. This finding corroborated Hozmi's (2008) assertion that the computer skills possessed by students with disabilities do not differ in terms of disability.

Furthermore, the Pearson correlation analysis was conducted to determine the direction and strength of the relationships between students' knowledge about computers the skills they possess for using computers. Table 6 displays the output of the correlation analysis.

Table 6: Pearson product-moment correlation analysis

		Knowledge	**Skills**
Knowledge	Pearson Correlation	1	.768**
	Sig. (2-tailed)		.000
	N	46	46
Skills	Pearson Correlation	.768**	1
	Sig. (2-tailed)	.000	
	N	46	46

**. Correlation is significant at the 0.01 level (2-tailed).
Source: Result of SPSS Analysis (2018).

From the results, it was revealed that computing knowledge among students with disabilities had a strong positive correlation (r = 0.768) with the skills they possess for using computers. This gives an indication that the more knowledgeable students are about computers, the more skilful they will be in using computers. This viewpoint agreed with the suggestions by Wu and Yeh (2012) who noted that students who are computer literate may be more skilful and competent with computers, when compared to other students.

5. Conclusion

Computing knowledge and skills are vital to successful education for all students in higher education institutions. It is even more important for students with disabilities, who need to be competent with using computers in order to enjoy the various advantages that computer technology offer to assist them in their education. It was revealed that although the students rated themselves as highly knowledgeable about computers, this did not have a significant influence on their skills for using computers. Also, it is clear that a disability in itself does not influence a person's knowledge and skills about computers. However, it is the strongly held view of the researchers that when students with disabilities undergo regular individualized computer training, in a specialized computer and assistive technology laboratory, their skills will be highly improved, resulting in higher computer competencies. This training will be most effective and appropriate when provided by competent ICT personnel who have an understanding of the technological needs of students with disabilities.

6. Recommendations

The following recommendations are made based on the findings from the study:

1) Students with disabilities should be taught computer literacy skills in basic computer applications such as word processing and internet browsing, to enable them gain and improve upon their computer competency.
2) A specialized computer and assistive technology laboratory with state-of-the-art tools and materials for students with disabilities should be established by the University to cater for computer training sessions and activities for students with disabilities.
3) Qualified and competent ICT personnel should be appointed by the University to take charge of the technology needs of students with disabilities. This would create an opportunity for these students to have access to technically competent persons who have the understanding and ability to assist them with their computer and technology-related needs.

Acknowledgement
We are grateful to all students with disabilities in the University of Education, Winneba who willing availed themselves to participate in this study.

About the Authors
The authors of this research report are staff of the University of Education, Winneba and have at least a Master of Philosophy in Special Education. They are interested in researching on issues relating to students with special needs and inclusive education.

References

Ademodi, D. T., & Adepoju, E. O. (2009). Computer skill among librarians in academic libraries in Ondo and Ekiti states, Nigeria. *Library Philosophy and Practice,* Retrieved from http://unllib.unl.edu/LPP/ademodi-adepoju.htm.

Albion, P. R. (2007). *Student teachers' confidence and competence for finding information on the Internet*. Retrieved, from http://eprints.usq.edu.au/2099/1 /infolit.pdf.

Beaula, A., & Raja, W. D. (2012). How does ICT facilitate extending teaching competence? *The Journal of English Language and Literary Studies, 2*(1), 106–115.

Bingimlas, K. A. (2009). Barriers to the successful integration of ICT in teaching and learning environments: A review of the literature. *Eurasia Journal of Mathematics, Science and Technology Education*, *5*(3), 235–245.

Bordbar, F. (2010). English teachers' attitudes toward computer-assisted language learning. *International Journal of Language Studies*, *4*(3), 27-54.

Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). *How people learn: Brain, mind, experience, and school.* Washington, D.C.: National Research Council.

Buabeng-Andoh, C. (2012). Factors influencing teachers' adoption and integration of information and communication technology into teaching: A review of the literature. *International Journal of Education and Development using Information and Communication Technology*, *8*(1), 136–155.

Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education.* (6th Ed), London: Routledge.

Danner, R. B., & Pessu, C. O. A. (2013). A survey of ICT competencies among students in teacher preparation programmes at the University of Benin, Benin City, Nigeria. *Journal of Information Technology Education: Research, 12*, 33–49.

Drescher, P. L. (2009). Access to computers for students with physical disabilities. In Wisconsin Assistive Technology Initiative. Assessing students' needs for assistive technology: A resource manual for school district teams. Wiscinson, USA: WATI. Retrieved from http://www.wati.org/content/supports/free/pdf/Ch4-ComputerAccess.pdf

Edwards, V. E., Portman, T. A. A., & Bethea, J. (2012). Counselling students' computer competency skills: effect of technology course in training. *Journal of Technology in Counseling*, *2*(2). Retrieved from http://jtc.columbusstate.edu/vol2_2/edwards.htm.

Elder, B., L., & Koehn, M. L. (2009). Assessment tool for nursing student computer competencies. *Nursing Education Perspectives*, *30*(3), 148–152.

Field, A. (2009). Discovering Statistics using SPSS. Sage: London

Fraenkel, J. R., & Wallen, N. E. (2000). *How to design and evaluate research in education* (5th Ed), New York: McGraw-Hill Publishing Co.

Fraillon, J., Schulz, W., & Ainley, J. (2013). International computer and information literacy study: Assessment framework. Retrieved from

https://research.acer.edu.au/cgi/viewcontent.cgi?article=1010&context=ict_literacy

Frimpong-Kwapong, O. A. T. (2009). Comparing knowledge and usage of ICT among male and female distance learners of an endowed and deprived area in a developing country in Africa. *Journal of Information Technology Education*, *8*, 1–17.

Hilberg, J. S., & Meiselwitz, G. (2008). Undergraduate fluency with information and communication technology: Perceptions and reality. *Proceedings of the 9th ACM SIGITE Conference on Information Technology Education*.

Hof, M., (2012). Questionnaire evaluation with Factor Analysis and Cronbach's Alpha:

Hozmi, B. (2008). *Evaluation of the computer literacy program at the Karten CTEC Center for People with Deaf-Blindness.* The Trump International Institute for Continuing Education for People with Developmental Disabilities, Research and Development Unit. Retrieved from http://www.karten-network.org.uk/.

Itsekor, V. O. & Ugwunna, I. S. (2014). ICT competencies in the 21st century library profession: a departure from the past. *International Journal of Academic Library and Information Science*, *2*(5), 51-57. Retrieved from http://www.academicresearchjournals.org/IJALIS/Index.htm.

Kaye, H. S. (2000). Computer and Internet use among people with disabilities. *Disability Statistics Report (13).* Washington DC: U.S. Department of Education, National Institute on Disability and Rehabilitation Research.

Khalid, F., Nawawi, M. H., & Roslan, S. (2009). Integration of ICT in Malaysian secondary schools: What conditions will facilitate its use? *The International Journal of Learning*, *15*(12), 85–93.

Lambert, J., Gong, Y., & Cuper, P. (2008). Technology, transfer, and teaching: The impact of a single technology course on pre-service teachers' computer attitudes and ability. *Journal of Technology and Teacher Education, 16*(4), 385–410.

Lawrence, A., & Veena, K. (2011). Improving teacher competency through ICT. Retrieved on May, 21, 2018, from http://www.academia.edu/1462066/ICT_AND_TEACHER_COMPETENCIES.

Leedy, P. D., & Ormrod, J. E. (2005). *Practical research: planning and designing*. (8th ed). Upper Saddle River, New Jersey: Pearson Education Inc.

Luft, P., Bonello, M., & Zirzow, N. K. (2009). Technology skills assessment for deaf and hard of hearing students in secondary school. *American Annals of the Deaf*, *154*(4), 389 – 99.

Manir, A. K. (2011). ICT competency framework for library and information science in schools in Nigeria: The need for model curriculum. *International Journal of Library and Information Science*, *3*(4), 68-80.

Masood, S., Khan R. A., & Waheed, G. (2010). Computer literacy among the medical staff at Avicenna Medical College and Hospital. Retrieved from http://pjmhsonline.com/computer_literacy_among_the_medi.htm.

McCannon, M. & O'Neal, P. V. (2003). Results of a national survey indicating information technology skills needed by nurses at time of entry into the workforce. *Journal of Nursing Education*. *42*, 337–340.

McDonald, D. (2004). Computer literacy skills for computer information systems majors: A case study. *Journal of Information Systems Education*, *15*, 19-34.

Oliver, R. (2000). Information and communications technology literacy: Getting serious about IT. *Proceedings of ED-MEDIA 2000*. AACE, Montréal, Canada, June 26 – July 1, 2000.

Owens, L. K. (2002). *Introduction to survey research design.* Retrieved May 14, 2018 from http://www.srl.uic.edu/seminars/Intro/introsrm.pdf.

Ozoemelem, O. A. (2010). Web affinity: A study of undergraduate students in Nigerian universities. *Library Philosophy and Practice [e-journal].* Retrieved on from http://www.webpages.uidaho.edu/~mbolin/obuh2.htm

Pelgrum, W. J. (2001). Obstacles to the integration of ICT in education: Results from a worldwide educational assessment. *Computers & Education, 3*(2), 157–161.

Peralta, H., Costa, F. A. (2007). Teachers' competence and confidence regarding the use of ICT. *Educational Sciences Journal*, *3*, 75–84.

Power, M. R., Power, D., & Horstmanshof, L. (2007). Deaf people communicating via SMS, TTY, relay service, fax, and computers in Australia. *Journal of Deaf Studies and Deaf Education, 12*(1), 80–92.

Sincero, S. M. (2012). *Advantages and disadvantages of surveys*. Retrieved from https://explorable.com/advantages-and-disadvantages-of-surveys

Tella, A. (2009). Correlates of undergraduates' information-seeking behaviour. *College & Undergraduate Libraries, 16*(1), 1–19.

Tella, A., & Mutula, S. M. (2008). Gender differences in computer literacy among undergraduate students at the University of Botswana: Implications for library use. *Malaysian Journal of Library & Information Science*, *13*(3), 59–76.

Wallace, A. R. (1999). An exploratory study of the factors influencing the construction of computer self-efficacy. *Unpublished Doctoral thesis. Charles Stuart University.*

Wallace, P. & Clariana, R. B. (2005). Perception versus reality – determining business students' computer literacy skills and need for instruction in information concepts and technology. *Journal of Information Technology Education*, *4*, 141–151.

Wu, M. D., & Yeh, S. T. (2012). Effects of undergraduate student computer competence on usage of library electronic collections. *Journal of Library and Information Studies, 10*(1), 1–17.

Yu, B., Kim, K., & Roh, S. (2001). A user analysis for web-based distance education. Proceedings of the annual topics on distance learning conference, USA. Retrieved from http://www.calumet.purdue.edu/todl/proceedings

Yusuf, M. O. & Balogun, M. R. (2011). Student-teachers' competence and attitude towards Information and Communication Technology: A Case study in a Nigerian University. *Contemporary Educational Technology, 2*(1), 18–36.