Penda Annie
Kwame Nkrumah University,
Kabwe, Zambia

The Best Practices in the use of Digital and Emerging Technologies for Learning by Trainee Students for Special Education under ODL at Kwame Nkrumah University

Penda Annie

Abstract

This manuscript is about capacity building of teachers handling leaners with disabilities using information and communication technology. Teaching is a process of imparting knowledge in learners while learning is a process or acquiring academic knowledge and skills. In the process of teaching and learning capacity building of teachers is highly valued. This study was administered to establish the best ways that enrich the training of teachers for children with special needs using the emerging technology in order to promote teaching for learners with special needs for sustainable development under ODL. The study also examined the impact of using digital technology and emerging technology of trainee students under ODL special education programme under ODL.

The findings were that the emerging technology such as the use of digital technology and emerging technology or information and communication technology was used by students to learn effectively. Another finding was that digital technology such as the use of computers, cell phones, tablets, Skype, WI-Fi, internet, e-book and televisions were used for easy and effective learning.

The study site was Kwame Nkrumah University. It was chosen because ODL is being offered. The instruments used for data collection were the interview schedule and a questionnaire. Population comprised of all the students doing special education under ODL at Kwame Nkrumah University. The total sample was 50 and these were students. Data was analyzed manually and using SPSS.

Keywords: teachers, special education, training, sustainable, learning and teaching

Introduction
Background
This study includes the abstract, back ground, literature review, problem statement, aims, objectives, research questions, methodology, research design, findings, discussions and references.

Kwame Nkrumah University is one the higher learning institution where teachers who are handling learners with disabilities are trained under open and distance learning. Disability is a reduced function or loss of a particular body part or organ. A disability limits the ability of an individual to perform certain tasks like writing, reading, thinking, walking, speaking or talking. The person with a disability is not a handicap unless the physical disability leads to educational, personal, social, vocational or other challenges. The examples of learners with disabilities are persons with emotional and behavioural disorder, visual impairment, hearing impairment, physical disabilities, communication disorder and intellectual disability.

Open and distance learning started in 1997 with the offering of diploma courses then in 2009 the programme changed to the offering of first degree. Then in 2010 offering of special education first degree programme commenced.

In the past when diploma was being offered the use of modern technology like computers and cellphones were not mostly used for academic purposes as compared to the time when first degree programme started to be offered to date. The emerging and digital technology has been now utilized by students during learning periods. This study aim at establishing

Correspondence:
Penda Annie
Kwame Nkrumah University,
Kabwe, Zambia

how the technology was used by students during learning for sustainable development at Kwame Nkrumah University.

Literature review

This section is looking at improvements which are brought about by the emerging and digital technology. To start with a study was conducted by Massy and Zemsky,(1995) on the use of information technology to enhance academic productivity in Washington. The finding was that, the use of emerging technology brought the change of printing technology from hand written and it lasted for long period of time. In other words the technology brought about sustainable development of using printing technology.

Another study was conducted by Gui-Rosenblit, (2009) on distance education on digital age. The finding was that, the use of digital technology improved both teaching and learning due to the easy retrieval of the available material resources in the cases were text books were not available or proof to be very expensive. The sustainable improvement was easy access to resources.

The other study focused on the use of technology for enhancing teaching and learning in Bangladeshi by Taylor, (2012) the finding was that, use of digital and emerging technology enrich and support learning during lectures, seminars, meetings and face to face tutorials. The sustainable improvement was to sustain learning of learners.

Problem statement

For a long period from 1997 to 2008 the use of technology for teaching and learning purposes was rare at Kwame Nkrumah University when ODL was established as compared to the current scenario from 2009 to date. Students during this time have the opportunity to learn using emerging and digital technology. Knowledge of whether the students are learning using the technology or not and knowing whether the technology could be used for sustainable development and be of benefit to them during their training lies on review of this study. The experiences of students concerning the use of emerging and digital technology during their training have not been reviewed and documented, the reason this study has been instituted. This study therefore meant to answer the question, "what are the experiences of trainee students for special education programme under ODL concerning the use of emerging and digital technology at Kwame Nkrumah University?"

Aim

The aim of the study was to ascertain the experiences and sustainable development concerning the use of emerging and digital technology by trainee teachers for special education while learning under ODL.

Research Objectives

The study was guided by the following objectives
- To establish the emerging and digital technology being used by students under special education program during learning under ODL.
- Establish emerging technologies that could be used for sustainable development under ODL.
- To establish the development brought about by the emerging and digital technology to students under special education program during their learning period.

Research Questions

- What was the emerging and digital technologies being used by students under special education program during learning under ODL?
- What are the emerging technologies that can be used for sustainable development under ODL?
- What were the developments brought about by the emerging and digital technology to students under special education program during their learning period?

Methodology

Research design

Since the study sought to ascertain the sustainable development emerging and digital technology has on learning under ODL a descriptive research design was used. According to Mukul and Deepa (2013) descriptive research deals with the description of the state of affairs as it exists at present. The study used descriptive research design and fitted well the study because it describes the study of particular situation at particular time.

Population, sample and instrument

The population comprised of all trainee students for special education under ODL. The total sample comprised of 50 students. The instruments used were the interview guide and questionnaire.

Findings

This section presents the finding of this study concerning digital and emerging technology. Data was collected concerning Information and communication technology as emerging technology which was used by students under special education program while learning at Kwame Nkrumah University under ODL. The digital technology that was used by students included cellphones, laptops, desktops, tablets, cellphones, skype, Wi-Fi, internet, e-book and television. It was also found that majority of students used all that is listed as shown in table 1.

Table 1: Descriptive Statistics for Students

Emerging technologies	N	Minimum	Maximum	Mean	Std. Deviation
using laptops	50	1	2	1.28	.454
desktop	50	1	2	1.26	.443
using tablets	50	1	2	1.52	.505
using cellphones	50	1	2	1.04	.198
using skype	50	1	2	1.80	.404
using Wi-Fi	50	1	2	1.26	.443
using internet	50	1	2	1.04	.198
using e-book	50	1	2	1.52	.505
using television	50	1	2	1.72	.454
Valid N (list wise)	50				

Table 1shows the average responses from students concerning the use of digital and emerging technologies.
The emerging technologies are the use of a) laptops b) desktops c) tablets d) cellphones e) Skype f) WIFI g) internet h) e-book i) television.
The mean score in all categories were between 1.04 and 1.80. The lowest mean score was the use of internet and cellphones (1.04) and the highest was the use of Skype (1.80). It is worth noting that high scores were also under the following emerging technologies the use of television (1.72) and use of e-book and tablets (1.52).

One-Sample Statistics-t Test

Table 2: One-Sample Statistics-t Test for emerging technology
One-Sample Test

Emerging technology	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
using laptops	19.956	49	.000	1.280	1.15	1.41
desktop	20.108	49	.000	1.260	1.13	1.39
using tablets	21.297	49	.000	1.520	1.38	1.66
using cellphones	37.151	49	.000	1.040	.98	1.10
using Skype	31.500	49	.000	1.800	1.69	1.91
using Wi-Fi	20.108	49	.000	1.260	1.13	1.39
using internet	51.000	49	.000	1.020	.98	1.06
using e-book	21.297	49	.000	1.520	1.38	1.66
using television	26.815	49	.000	1.720	1.59	1.85

Note: denotes significant value (<.05)

The one-sample statistics-t-test was run to compare the mean difference in the nine digital and emerging technologies. The statistics were significant in all situations, for instance the difference between the two mean was less than 0.05. the use of internet (t=51.000; DF = 49; sig. (2-tailed)=.000 a=0.05 and the benefits of criterion reference assessment (t=31.500; DF = 49; sig. (2-tailed)=.000 a=0.05

Digital and Emerging Technologies that could be used for sustainable development

Table 3: Descriptive Statistics for Students

Emerging technology For sustainable development	N	Minimum	Maximum	Mean	Std. Deviation
laptops	50	1	2	1.22	.418
desktop	50	1	2	1.16	.370
tablets	50	1	2	1.68	.471
cellphones	50	1	2	1.06	.240
Skype	50	1	2	1.82	.388
Wi-Fi	50	1	2	1.34	.479
internet	50	1	2	1.04	.198
e-book	50	1	2	1.10	.303
television	49	1	2	1.76	.434
Valid N (listwise)	49				

Table 3 shows the average responses from students concerning the use of digital and emerging technologies that could be used for sustainable development.
The emerging technologies used were a) laptops b) desktops c) tablets d) cellphones e) Skype f) WIFI g) internet h) e-book i) television.
The mean score in all categories were between 1.04 and 1.82. The lowest mean score was the use of internet (1.04) and the highest was the use of Skype (1.82). It is worth noting that high scores were also under the following emerging technologies the use of television (1.76) and tablets (1.52).

One-Sample Statistics-t Test

Table 4: One-Sample Statistics-t Test for digital and emerging technology
One-Sample Test

Emerging technology For sustainable development	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
laptops	20.616	49	.000	1.220	1.10	1.34
desktop	22.149	49	.000	1.160	1.05	1.27
tablets	25.210	49	.000	1.680	1.55	1.81
cellphones	31.244	49	.000	1.060	.99	1.13
Skype	33.161	49	.000	1.820	1.71	1.93
Wi-Fi	19.801	49	.000	1.340	1.20	1.48
internet	37.151	49	.000	1.040	.98	1.10

e-book	25.667	49	.000	1.100	1.01	1.19
television	27.768	49	.000	1.740	1.61	1.87

Note: denotes significant value (<.05)

The one-sample statistics-t-test was run to compare the mean difference in the nine digital and emerging technologies. The statistics were significant in all situations, for instance the difference between the two mean was less than 0.05. the use of internet (t=37151; DF = 49; sig. (2-tailed)=.000 a=0.05 and the benefits of criterion reference assessment (t=33 161; DF = 49; sig. (2-tailed)=.000 a=0.05

The responses concerning the benefits of emerging technology to students
The responses concerning the benefits of emerging technology to trainee students for special education was as follows; One respondent stated that, 'it helped in completing work faster and easier and in good time within the stipulated time for submission'. The other response was that, the student was able to access information for the courses and assignment in the shortest possible time. Another respondent reported that 'I used it to research for information for my assignments and I always found answers because internet was accurate'. The response from one respondent was that, I used the computer to check for wrong spelling in my assignments and I used the internet to acquire more academic knowledge on top of what I was given by the lecturers. The answer from another respondent was that, ' digital and emerging technology helped me to save and store a lot of data electronically especially using computers'.
Some respondents said that, it was convenient in terms of communication to the lecturers and fellow students concerning the academic work. A response by most students was that, they used emerging technology to type their work using any of them such as the cellphone, tablet, laptop and desktop.
Then another respondent narrated that, 'I am provided with adequate and up to-date information about my academic work using digital and merging technology or ICTs'. Then other respondents reported that, they accessed information very fast and found books for reference and especially new text books with latest information pertaining any subject matter for their studies with the use of such as e-books. Another explanation from one respondent was that, 'I used it when I was studying and I always found details about the learnt topics for my courses. Another respondent expressed that, a cellphone was helpful for research because I was able to search from the internet using it at any time and it was potable and handy to use. Yet further response from some students was that, it was relatively cheaper to use digital and emerging technology for their studies.
The other student reported that digital and emerging technology was helpful during research work because it supplied me with vital information concerning research in terms of literature review, research methods, analysis and interpreting of data. One respondent indicated that, 'I was able to learn and understand any topic from anywhere for instance at the campus during residential periods and while at home because my mobile was always with me to help me understand anything that I was not sure of'.

Discussions of findings- This section presents the discussion of the findings. The emerging or digital technology being used during learning under ODL were established and these were the laptops, desktops, tablets, cellphones, Skype, Wi-Fi, internet, e-book, television and information and communication technology. The finding was in line with what was discovered by Gui-Rosenblit, (2009) who stated that digital technology used while teaching and learning involves the use of the mobile phones, use of e-mail and computers and use of emerging technology which involves the use of information and communication technology. However the current study discovered even what was mostly and least used. For instance, the most used digital and emerging technologies were the internet and cellphones followed by desktops, Wi-Fi, laptops, tablets and the least to be used were the skype, television and e-book and the statistics were significant in all situations.
It was further discovered by Gui-Rosenblit, (2009) that digital and emerging technology or information and communication technology improved both teaching and learning due to the easy retrieval of the available material resources in the cases were text books were not available or proof to be very expensive. This was similar to the current finding where students found it easy to access the most needed information, carrying out research, saving of information, communication, individual learning and submission of assignment on time.
However, Gui-Rosenblit did not discover other benefits to students as discovered by this study such as promotion of individual learning, communication among students and lecturers, and acquisition of technological skills by using the tool for technology apart from the provision of the most needed resources.
The other study by Taylor, (2012) found that, the use of digital and emerging technology enrich and support learning for sustainable development. This was also discovered by the current study. Although the current study discovered further the emerging and digital technology for sustainable development that could be mostly used by students such as the internet and cellphones followed by e-book, desktop, laptop and Wi-Fi while the least to be used were Skype, television and tablets and statistics were significant in all situations. The current further discovered that, digital and emerging technology could be used for sustainable development under ODL because it promotes individual learning, communication among students and lecturers, and acquisition of technological skills by using the tool for technology.

Conclusion
This study has reviewed the digital and emerging technologies that could be used and how beneficial they are to students under ODL. It has also found the digital and emerging technologies that could be used for sustainable development under ODL context.

Recommendations
There is need to encourage students under ODL to continue using digital and emerging technologies. There is need to provide training on the use of digital and emerging technologies to students under ODL because it is beneficial.

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