E-Learning Technology in Distance Education: Identifying Learner Preferences of Knowledge Sharing Tools and Educational Strategy

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Abstract
Electronic learning (e-learning) is a term used to describe any form of education where knowledge sharing is primarily by means of electronic media and communication based technologies. This is one of the methods adopted by distance learning institutions. In Nigeria, many universities are now offering programs by distance learning where the learners in geographically dispersed locations and study at their own pace. The adoption of this form of education by higher institutions in Nigeria is on the increase. There are many tools, media and channels of communication available to these institutions of higher learning. The basic media include e-books, audio, video, computers, and mobile phones. Studies concluded that cultural background and learning styles may influence the effectiveness of the learning tools which could in turn lead to distortion of student learning. It is important that the most suitable of these channels as perceived by the learners themselves be understood. This would enable the institutions to understand the learning styles and expectations of the learners so as to provide the necessary support by focusing on the ones that encourage learning as perceived by the learner. The objective of this study is to understand the learner preferences of e-learning tools used by distance learning institutions in Nigeria. The study used as case study an open and distance learning university that employs e-learning technology as its major means of disseminating information. The study applied questionnaire to collect data from 245 students from two study centers of the National Open University of Nigeria (NOUN). The study found a total of two hundred survey responses to be usable. The study analysis provided results of questions in three categories: Learner-instructor-interaction preferences; Learner-learner-interaction preferences; and Learner ability to learn independently. Results of the study indicated that the most preferred tool for knowledge sharing was significantly different for males and females (at $\propto= 0.05$), which indicates that for the different sexes different approaches or education strategies for distance learning using technology might be better suited based on preferential bias. Results of the study may be useful as decision tools for evaluating and understanding the various teaching/learning tools and communication strategies so as to focus on the ones that encourage learning in our environment. The study recommended that institutions should attempt to use the knowledge transfer method perceived by the learner to be more beneficial to them as they establish the learning method that best suit them.
Keywords: learning media, electronic learning, e-learning, distance learning, ICT, educational strategies, knowledge sharing

1.0 Introduction and Background

Learning is described as "the activity, procedure, or capability of gaining knowledge or skill." The usual formal method of learning between a teacher and his students in a higher institution is the conventional face to face instruction mode of learning. With the convenience that distance learning offers, and the large population of Nigerians who fail do not qualify for university admission due to limited space, the other option open to them is the distance education. Distance education refers to any form of knowledge transfer that takes place between the learner and the instructor when they are both in different geographical location (Portway and Lane, 1994).This form of education, make use of tools, media and teaching strategy that are peculiar to this form of learning. One type of learning method is the electronic learning form of distance learning. E-learning is becoming a trend in many universities in Nigeria due to its many advantages. It is also called technology-enhanced learning (TEL), distance / open education, or virtual education. It makes use of various electronic media to impact knowledge between the lecturer and his students; and also to distribute instructional materials (Wagner, 2005; Shavinina, 2001). E-learning has played key roles in the corporate world and in education such that it has been predicted that with time the traditional classroom mode of learning in universities will be a thing of the past (Haverila and Barkhi, 2009 ; Tamrakar and K. Mehta, 2011). Haverila and Barkhi (2009) added that with e-learning technology, teacher's role has changed from knowledge importers to knowledge expeditors. The e-learning technology uses various media which can deliver text, audio, images, animation, and streaming video materials. In other words, the multimedia technologies and the internet are the basic enablers of electronic learning (e-

learning) technologies. Some of these tools are becoming more popular in usage than others in e-learning institutions. There is the need to assess the e-learning preferences of these tool by the students in Nigerian distance learning institutions so as to provide information for institutions to better decide on the tools for better knowledge impartation.

1.1 Statement of Problem

Studies have shown that the distance learning mode of instructional learning is as effective as the traditional face to face mode when the technology and strategy used are appropriate. The two critical task are: the student to student interaction; and the teacher to student task that require feedback. If the instructional session is delivered timely and feedback from teacher to student is timely, the distance learning instructional method of learning becomes effective (Moore and Thompson, 1990; Verduin and Clark, 1991).Knowledge sharing tools such are particularly of importance in distance learning as they promote exchange and dialogue among learners and instructor (Shuaibu,2015). Knowledge sharing tools are important factors in innovating the practice of lecturing in universities increasing the long-term prospects of success in achieving overall educational objectives (Alhaimmaid, Faori and Husan,2009) with the aim of the utilization of such tools being to transmit existing knowledge or create new knowledge (Oyefolahan, Dominic and Karim (2012). Each of the tools used by distance learning institutions that have adopted e-learning technology offer the teacher and learner unique and different ways of teaching and learning that traditional classrooms to do not (Cranton, 1994). However, whether any of these tools, media and strategy is more preferred need to be determined to support institutions in deciding the ones to focus their effort and scarce resources. The common tools employed by institution in all these areas include lectures-slides, audio and video, tutorials, self-assessment tests, discussion boards, mail facilities, chat rooms and relevant external site links (Ololube et al., 2007). How these students perceive these tools and media as well as the strategies used to transfer knowledge need to be determined so that instructors and also the institutions can focus more on the ones that the students perceived to be more beneficial to them.

1.2 Objective of Study

There has been studies that concluded that cultural background and learning styles may influence the effectiveness of these online tools which could in turn lead to distortion of student learning (Korkofingas, 2015). It is important for institutions using e-learning technology as their main method of teaching to understand which of these learning tools and strategies support student progress and are therefore more effective than others based of student perception. The objective of this study is to identify the tools, media and strategies adopted by distance learning institution in Nigeria and determine which of these tools, media and strategies are perceived to be preferred by the male and female gender categories respectively.

1.3 Research Questions
  i.   What are the basic tools for the delivery of distance learning education using e-learning technology in Nigeria?
  ii. Which of the basic tools are most preferred by the learners in the distance learning institutions under study?
  iii. What e-learning tools and communication strategies do learner perceive to be more effective in supporting the transfer of knowledge?

1.4 Materials and Methods

In this study, a survey method was used to collect data by means of questionnaire instrument. Usable data was collected from 200 participants. The students of National Open University of Nigeria (NOUN) from two study centres participated in the research. The questionnaire collected data that covered: the media used to deliver instructional materials; whether they are satisfied with the learner to learner interaction strategy; whether they are satisfied with the instructor to learner interactions. They were asked to rate their level of satisfaction on a scale of one to five: SA – Strongly agree, A – Agree, N – Neutral, D – Disagree, and SD – strongly disagree. The analysis of the data was carried out using the SPSS Version 21 package.

1.5 Result of Analysis

Figure 1 shows the age group distribution of respondents. Figure 2 shows the ICT skill of respondents and Figure 2 shows the ICT skill of respondents where 80% of respondents were adequately skilled in the use of ICT.
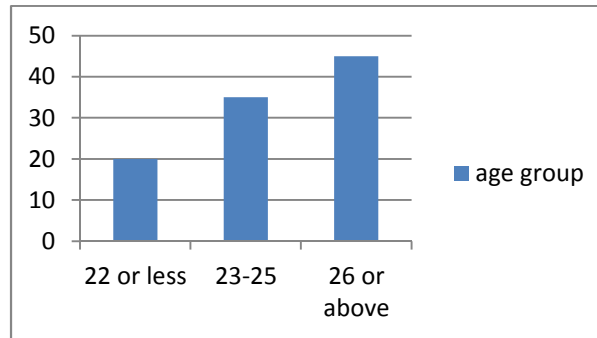
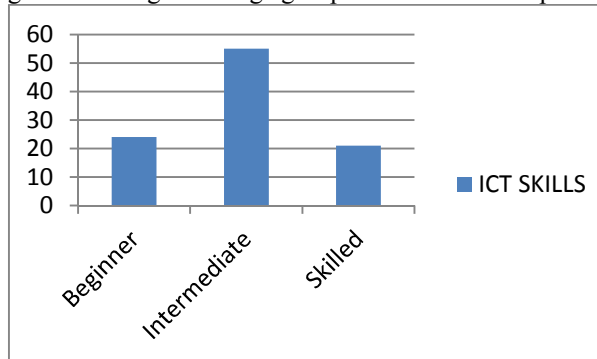Figure 1: Histogram of age group distribution of respondents

Figure 2: Histogram of ICT Skills of respondents

Table 1 and Figure 3 show the basic online distance learning tools used by case institution and the respondents that prefer each medium as means of learning and interaction.

Table 1: E-Learning media used by institution and respondents preferences

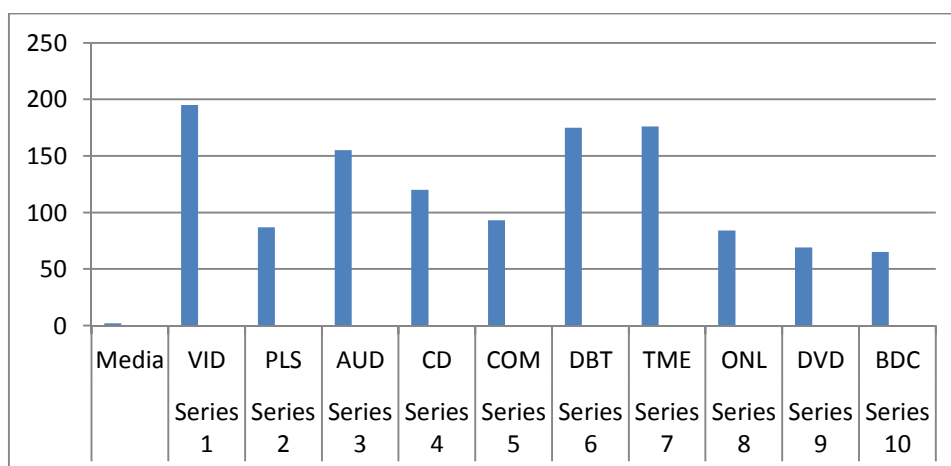| S/N	Instructional / Interaction Media	Abbreviation of Media	Num. of Respondents preferred tool	%
1	Video	VID	195	97.5
2	ebooks / Text material	TME	176	88.0
3	Discussion boards / Tool (Chat rooms)	DBT	175	87.5
4	Audio	AUD	155	77.5
5	CD	CD	120	60.0
6	Computer	COM	93	46.5
7	Presentation / Lectures-slides	PLS	87	43.5
8	Online	ONL	84	42.0
9	DVD	DVD	69	34.5
10	Broadcast	BDC	65	32.5

Figure 3: Respondents media preferences

Table 2 shows other teaching and learning medium currently not in place but which the students perceived would enhance learning as well as interaction between them and instructor. Tables 3 shows the

responses of the students on their ability to learn independently; Table 4 shows the Learner-instructor-interaction preferences; and Table 5 shows the learner-learner preferences in e-learning.

Table 2: Other means not in place but recommended by students

	Medium	Number of students that want this service	%
1	Discussion Forum For Students	186	93
2	Teacher And Student Forum	198	99
3	Virtual Library	164	82
4	Adequate feedback from Instructors	184	92

Tables 3: Ability to learn independently in e-learning

S/N	ITEMS	SA (%)	A (%)	N (%)	D (%)	SD (%)
1	In e-learning my learning is personalized	52(26%)	16(8.0%)	32(16%)	80(40%)	20(10%)
2	In e- learning I can learn anytime, anywhere	132(66%)	56(28%)	8(4.0%)	4(2.0%)	12(6%)
3	E- learning present what is suitable for my learning style	68(34%)	52(26%)	8(4.0%)	44(22%)	28(14%)
4	E-learning presents suitable technical support	12(6.%)	14(7.0%)	40(20%)	44(22&)	80(40%)
5	E – learning eases the process of learning	96(48%)	86(43%)	4(2.0%)	12(6.0%)	2(1.0%)
6	E – learning encourages me to learn more	44(22%)	96(48&)	8(4.0%)	40(20%)	12(6.0%)
7	E- learning increases the motivation to learn	44(22%)	86(48%)	28(14%)	28(14%)	4(2.0%)
8	E – learning help me to manage my time and self-discipline	72(36%)	84(42%)	4(2.0%)	38(19%)	2(1.0%)
9	My specific learning time in e- learning was spent fully in learning	24(12%)	42(21%)	52(26%)	64(32%)	18(9.0%)
10	I prefer to do the task and test through e-learning tools	72(36%)	88(44%)	8(4.0%)	22(11%)	10(5.0%)
11	I prefer to obtain my scores through e-learning tools	76(38%)	112(56%)	4(2.0%)	6(3.0%)	2(1.0%)
12	My result in e-learning were better compared to those I received in traditional learning	8(4.0%)	14(7.0%)	28(14%)	86(43%)	64(32%)
14	E- Learning met my needs.	52(26%)	76(38%)	12(6.0%)	56(28%)	4(2.0%)
15	E- learning met my expectation	32(16%)	64(32%)	16(8.0%)	80(40%)	8(4.0%)
16	I enjoyed learning by e- learning	60(30%)	84(42%)	8(4.0%)	40(20%)	8(4.0%)
17	I felt more freedom learning by e- learning	68(34%)	84(42%)	4(2.0%)	40(20%)	4(2.0%)
18	E- learning has increased my confidence	8(4.0%)	36(18%)	2(1.0%)	82(41%)	72(36%)
19	I want to take other courses by e- learning	24(12%)	40(20%)	20(10%)	84(42%)	32(16%)

Key: SA – Strongly agree: A – Agree N – Neutral D – Disagree: SD – strongly disagree

Table 4: Learner-instructor-interaction in e- learning

Q.	ITEMS	SA	A	N	D	SD
20	I prefer communication with the instructor by e- learning tool compared to face to face	94(47%)	56(28%)	30(15%)	12(6.0%)	8(4%)
21	E- learning has increased communication with the instructor	12(6.0%)	8(4%)	30(15%)	94(47%)	56(28%)
22	I built a productive relationship with the instructor via e- learning	8(4%)	58(29%)	28(14%)	96(48%)	10(5.0%)
23	E- learning eased discussion with my instructor	12(6.0%)	60(30%)	20(10%)	104(52%)	4(2.0%)
24	E- learning encouraged me to discuss with my instructor	96(48%)	56(28%)	30(15%)	16(8.0%)	2(1.0%)
25	I enjoyed contacting my instructor via e-learning	96(48%)	60(30%)	20(10%)	20(10%)	4(2.0%)
26	In e-learning I received more attention from my instructor	16(8.0%)	56(28%)	20(10%)	104(52%)	4(2.0%)

SA – Strongly agree: A – agree N – neutral D – disagree: SD – strongly disagree

Table 5: Learner-learner-interaction preferences

Q.	ITEMS	SA	A	N	D	SD
27	I prefer to communicate with my classmate by e- learning compared to face to face	5(5.0%)	16(16%)	15(15%)	42(42%)	22(22%)
28	E- learning has increased my communication with other learners	7(7.0%)	8(8.0%)	10(10%)	50(50%)	25(25%)
29	I built a productive relationship with other learners via e- learning	7(7.0%)	10(10%)	10(10%)	48(48%)	25(25%)
30	E- learning eased discussion with my classmate	10(10%)	25(25%)	12(12%)	47(47%)	6(6.0%)
31	E- learning encouraged me to participate in discussion with my classmate	10(10%)	8(8.0%)	10(10%)	25(25%)	47(47%)
32	I enjoyed contacting my classmate via e- learning	12(%12)	5(5.0%)	8(8.0%)	45(45%)	30(30%)

SA – Strongly agree: A – Agree N – Neutral D – Disagree: SD – strongly disagree

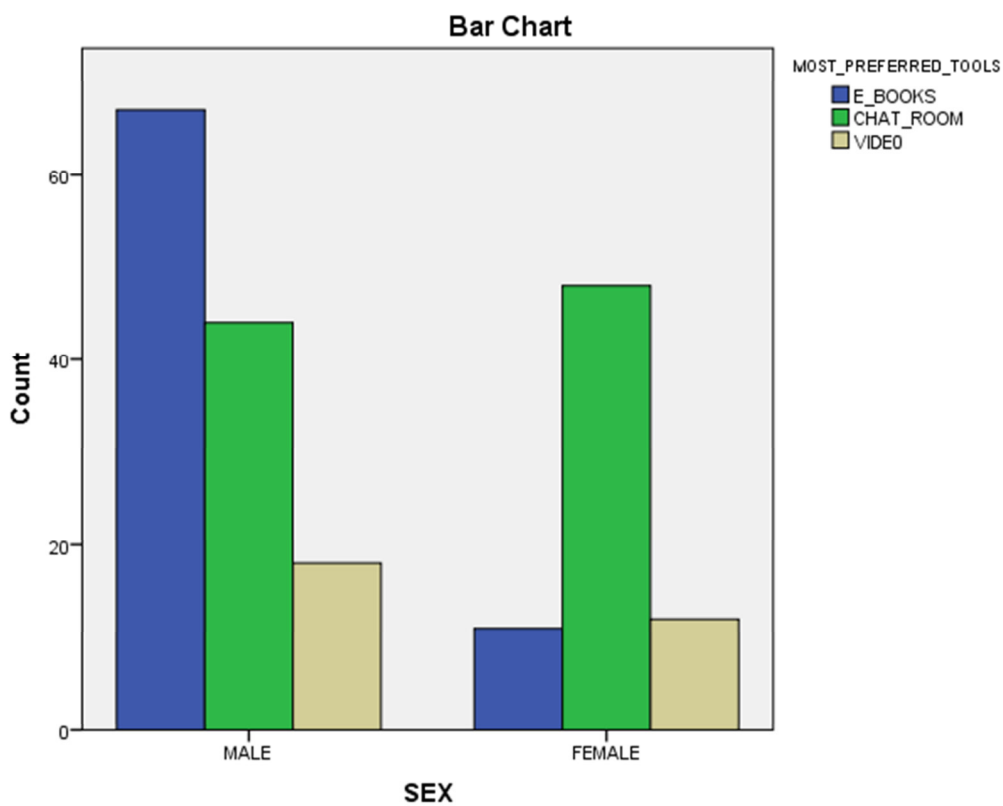Figure 4: Distribution of learners' most preferred tool

Figure 4 shows that the distribution of the most preferred tool for Knowledge sharing varied with gender, with the males preferring e-books and the females preferring Chat rooms the most.

Table 6: Cross-tabulation of most preferred tools by sex.

			MOST_PREFERRED_TOOLS			Total
			E_BOOKS	CHAT_ROOM	VIDE0	
SEX	MALE	Count	67	44	18	129
		Expected Count	50.3	59.3	19.4	129.0
		% within SEX	51.9%	34.1%	14.0%	100.0%
		% within MOST_PREFERRED_TOOLS	85.9%	47.8%	60.0%	64.5%
	FEMALE	Count	11	48	12	71
		Expected Count	27.7	32.7	10.7	71.0
		% within SEX	15.5%	67.6%	16.9%	100.0%
		% within MOST_PREFERRED_TOOLS	14.1%	52.2%	40.0%	35.5%
Total		Count	78	92	30	200
		Expected Count	78.0	92.0	30.0	200.0
		% within SEX	39.0%	46.0%	15.0%	100.0%
		% within MOST_PREFERRED_TOOLS	100.0%	100.0%	100.0%	100.0%

Table 7: Chi square test for learners most preferred tool by gender

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	27.032[a]	2	.000
Likelihood Ratio	28.985	2	.000
Linear-by-Linear Association	14.658	1	.000
N of Valid Cases	200		

A

Table 7 shows that the variation of most preferred tool for knowledge sharing was significantly different for males and females (at $\propto = 0.05$).

1.6 Discussion

E-learning has affected the way the students communicate with the instructor and the instructors rarely respond to student emails or other form of communication. The result of the analysis shows that 80% of the respondents were of age 23 years and above. This means that students of Open University are mainly adult students. With the use of ICT for the application, registration and actual examinations by examination bodies in Nigeria, many students in higher institutions are already skilled in the use of the technology and as Figure 1 indicates, over 70% of the respondents are skilled in the use of ICT. The method of e-learning practiced is the asynchronous one in which learners need not participate in learning at the same time. Learners have their own personal schedule and 72% of respondent confirm that it is convenient for them. The responses showed that the learner would want to have more contact with the instructor as they rarely receive feedback from their instructors. It is necessary that the teacher provide regular feedback to the students to monitor their progress. He can create personal contact with learner through email or telephone. The analysis result showed that learner want more interactive sessions with their instructors and with fellow learners. The current method available is not satisfactory as 72% are not encouraged to participate in student - student discussion groups. Seventy-eight percent (78%) responded that they prefer the mode of learning offered by the distance learning university under study. Seventy-two percent (72%) perceived e-learning to meet their needs and therefore prefer the freedom and flexibility offered by the learning method. Despite majority of them preferring the e-learning mode of education, their result does not reflect in their expected result as 75% of them indicated that their result in traditional learning were better compared to those they received in e-learning. The media used in the transfer of knowledge/instruction. Some 186 (93%) suggest the inclusion of discussion forum for students; 198 (99%) improve teacher and student forum; 184 (92%) suggested adequate feedback from Instructors. Also table 7 shows that the variation of most preferred tool for knowledge sharing was significantly different for males and females (at $\propto = 0.05$), which indicates that for the different sexes, diverse approaches or education strategies for distance learning using technology might be better suited based on preferential bias.

1.7 Findings

The study has identified the mode of communication and strategy for better learning as perceived by the students.

They suggested:

i.   A portal of the institution that incorporates discussion forum for students. This is to encourage student to student interaction. What many of them currently make use is Facebook.
ii.   Teacher - Student Forum was recommended by the students and
iii. Adequate feedback from Instructors

Findings from the study also show that the best three instructional material preferred by the students are shown in Table 6.

Table 6: Most preferred communication media

S/N	Instructional / Interaction Media	Total Number that preferred tool	%
1	Video	195	97.5
2	ebooks / Text material	176	88.0
3	Discussion boards / Tool (Chat rooms)	175	87.5

Nigeria with its large population of young people who are not able to get education in higher institutions through the conventional brick and mortar means are opting for education by distance learning. It is important that the most suitable means of communication that the institution can afford be focused in other to give the learners the best that the institution can offer.

1.8 Conclusion

The use of e-learning technology of the information and communication technology as well as other means of distance learning has caused significant savings in the cost of education especially for the learner. It has also enabled those who due to work and distance constraints would normally not be able to acquire. With the increase in population of Nigerians and the challenges faced by institutions to admit all qualified candidates who apply for the traditional brick and mortar programs where they must be present at the institutions to receive instructions, the distance learning mode of education using e-learning technology provide a very welcome alternative. For the mode of learning to be effective, the institutions need to take cognisance of the fact that learners have learning preferences which is influenced by a number of factors and should therefore identify and focus more often on these learning preferences that best fit the learner.

1.9 Suggestions for Further Studies

With the online model of distance learning becoming popular in other countries, there is the need for study to investigate the readiness of distance learning institution for this mode of learning as the ICT tools used in online technology has been found to be very supporting as students are able to connect to virtual classes real time and interact with instructors and other learners participating in discussions and have the opportunity to ask questions real time and get responses from instructors. How ready are our distance learning institutions to offer online distance learning programs?

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PROFILE

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