KNOWLEDGE MANAGEMENT AND STUDENT LEARNING OUTCOMES IN THE NATIONAL OPEN UNIVERSITY OF NIGERIA, BENIN STUDY CENTRE, EDO STATE

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Abstract
The study investigated into the contribution of knowledge management to student learning outcomes in the National Open University of Nigeria, Benin Study Centre, Edo State. The study adopted the descriptive research design of the ex-post facto type. Two hundred and seventy respondents were selected through a multi-stage sampling procedure. The instrument titled, 'Knowledge Management and Student Learning Outcomes Questionnaire (KMSLOQ)' with a reliability coefficient of 0.81 was used for data collection. The findings of this study revealed that the weighted average of the levels of participation of the students (in the National Open University of Nigeria, Benin Study Centre, Edo State) in knowledge creation, knowledge storage and knowledge sharing activities were 80.6%, 88.5% and 88.1% respectively. The three elements of knowledge management explored in this study (knowledge creation, knowledge storage and knowledge sharing), when taken together, accounted for 20.8% of the variance in the student learning outcomes (R Square = 0.208). These elements were found to contribute differentially to the student learning outcomes with knowledge sharing (β=0.271) being the most potent predictor of student learning outcomes followed by knowledge storage (β=0.188) and knowledge creation (β=0.173). It was recommended that students should be encouraged to pay attention to the knowledge management

elements viz., knowledge creation, knowledge storage and knowledge sharing.

Keywords: Knowledge management, student learning outcomes, knowledge creation, knowledge storage, knowledge sharing, academic performance

Introduction

A major characteristic of the formal educational setting is the high level of objectivity in the emphasis on expected change in behaviour, mindset and attitude, and a demonstration of knowledge attained by the student. Remarkably, this is because of the primacy of academic performance as an assessment tool used to ascertain if learning has actually occurred as it relates to this being a major criterion for determining which student progresses to the next stage of the learning programme. Consequently, there are expectations on the part of the institution and teachers. These expectations are summed up under a construct called, 'learning outcomes'. Learning outcomes are broad, yet direct statements that describe the competences that students should possess (i.e., what students should know and be able to demonstrate) upon the completion of a course or program (Lesch, 2011). These competences include knowledge, skills and attitudes (values); a clear articulation of the learning outcomes serves as the foundation to evaluating the effectiveness of the teaching and learning process (Osters, 2012). The Bloom's Taxonomy will be the crux of the discussion as to the learning outcome in this study as it relates to an assessment of students within the bounds of the cognitive, affective and psychomotor domains. The cognitive domain relates to the academic performance of students, and this is a major focus of stakeholders such as school administrators and employers of labour.

The academic performance of distance learning students is a concern for many administrators, professional organisations, and 'accreditating' agencies of distance learning courses and programs (Russell, 2006). This is because, according to Adedeji, Adelua and Oladejo (2011), one of the key criteria for judging educational standard and quality appears to be students' scholastic achievement. A university is as good as the quality of her graduates. Awe (2009), cited in, Ibijola (2014) posited that the quality of university education should

be a reflection of the performance of university graduates in the labour market. It is common practice that the quality of graduates is measured using academic performance (Adepoju, 2011). Adejuwon, Ilori and Owoso (2013) assert that in Nigeria generally, employers of labour are not satisfied with the quality of graduates available. The study carried out by Pitan and Adedeji (2012), cited in, British Council (2014) also corroborates this assertion. The scenario is worse for graduates of Open and Distance Learning (ODL) institutions. ODL institutions have faced a number of challenges over the years, the most contentious, being the public perception regarding the quality of ODL programmes as well as the acceptability of ODL certificates in the labour market because of the fear of quality compromise (Ofoha and Awe, 2011). Besides the problem of exceedingly high attrition rate, distance learning in many developing countries, Nigeria inclusive, is still grappling with the challenge of acceptance among most educational administrators and managers who are largely conservative in nature, and as a result, find it increasingly difficult to accept distance education as an alternative and perhaps, indispensable mode of education (Ojokheta, 2010). Entrepreneurs, private employers and many corporate executives have almost the same perception as they are not ready to accept the argument that distance learning students perform commensurately with or even better than face to face classroom students (Ali and Ahmad, 2011). There is a concern as to why there is a perception of poor learning outcomes of ODL students, who are considered to be largely more mature, self-motivated, economically independent and psychologically prepared than their colleagues who receive education in the traditional face-to-face setting.

These challenges, if not addressed, are capable of distorting the intended gains of ODL programmes. ODL as an educational method and a philosophic construct has been identified as the most potent instrument for combating the educational problems assailing a nation like Nigeria where the traditional universities are unable to admit all qualified applicants (Ojo and Olakulehin, 2006). The demand for tertiary education in Nigeria is high because it is not only an investment in human capital, but also a pre-requisite for sustainable economic development (Adeyemo, 2000), cited in, Adejuwon, Ilori and Owoso (2013). According to Adepoju, Akande and Adeyemi (2010), cited in, Adepoju (2011), there is high correlation between education and

economic growth, the world over. If the perception of the learning outcomes of students from ODL institutions remains poor, graduates from such institutions will experience serious challenges as regards career and academic advancement, and this in turn will make them reluctant to recommend ODL studies to others. Also, employers of labour may not be willing to release their staff to further education via distance learning programmes if the desired objectives in terms of better productivity are not guaranteed.

Despite the successes recorded, ODL is still under pressure to prove that the quality of its student learning is at least equivalent to the education received in the traditional face-to-face or what is also referred to as conventional teaching (Kirkpatrick, 2007). This is so because student learning is at the centre of the ODL experience (Ambe-Uva, 2007; Kirkpatrick, 2007; Alike, 2011; Bowa, 2011). The emphasis on student learning is a pointer to the importance of knowledge management on the part of the student. Research works carried out by Hawkridge (2002), Kim and Kusack (2005), Ambe-Uva (2007), Saxena (2007), Nnaka (2012) show that knowledge management in distance education is a topical issue. Knowledge management is vital in contemporary times as the economy in which we live presently is essentially knowledge-based. Education today has become subject to the pressures of the market place where the right management of knowledge is power. These pressures portend dynamic competition, and the attendant profound changes in communication have made institutions think and act like businesses (Brown and Duguid, 2000). Chaudhary (2005) argues that there is the strong need for educational institutions (including the National Open University of Nigeria [NOUN]) to deploy knowledge strategies, policies and tools to manage their knowledge as corporate assets so as to take and maintain their rightful place as "reservoirs of knowledge and learning" (Chiaha and Onwurah, 2011) and major players in knowledge management business (Ekpoh, 2011). This need cannot be ignored because universities collectively are a part of the world and consequently, are affected by the changes taking place in the world today.

It can therefore be argued that the university is suitable to adopt knowledge management as its environment places extreme emphasis on the creation, storage and sharing of knowledge. Chiaha and Onwurah (2011) further argue that universities cannot do without

knowledge management since their core activities revolve around the identification, sourcing, creation, capture, process, distribution, transfer, storage, retrieval, reuse and sharing of knowledge. Knowledge management is a multi-dimensional field of study and practice or as Desouza (2011) puts it, a highly interdisciplinary scholarly discipline that draws its roots from a number of other traditional academic disciplines like organisational science, cognitive science, linguistics and computational linguistics, information technologies, information and library science, technical writing and journalism, anthropology and sociology, education and training, storytelling and communication studies.

Knowledge management, in this study, shall be conceptualised within the confines of The General Knowledge Model. According to Newman and Conrad (1999), the model organises knowledge flows into four primary activity areas: knowledge creation, retention, transfer and utilization. This study conceives knowledge management in two different but inter-related dimensions viz., the institution and instructor dimension on one hand and the students dimension on the other hand. As such, there are the elements of knowledge creation, knowledge storage, knowledge transfer and knowledge utilisation on the part of the institution and instructor. As for the student dimension, we have knowledge creation, knowledge storage, knowledge sharing and knowledge utilisation. However, as it relates to learning outcomes with respect to students in the ODL setting, knowledge utilisation would not be considered as it falls outside the scope of this study since it would entail a study of how students deploy the knowledge they have created for use in everyday life and in their work environments.

The delivery of instruction on the part of the teacher, which is known as knowledge transfer, signals the beginning of the journey of knowledge creation on the part of the student. The scenario presented in distance education places so much responsibility on the students in the area of knowledge creation as more efforts are expected to be made as regards online resources. A knowledge-based economy is highly dependent on a generation of learners who are self-directed, motivated and eager to explore and discover knowledge independent of the teacher (Alike, 2011). The approach adopted by the NOUN makes the learners on one hand active and not dormant/passive listeners and the teacher, on the other hand, a facilitator unlike the case in

traditional mode of education where the latter dominates the activities of the class. The learner is thus placed in a position where he/she constructs or creates knowledge via an active process of development. A closer look at knowledge management especially from the perspective of the ODL setting shows that the transition from knowledge creation to knowledge utilisation tends more towards a spiral than a cycle cyclic (Soo, Midgley and Devinney, 2002). Uriarte (2008) strongly asserts that the process of knowledge creation, as depicted by the Nonaka and Takeuchi SECI model, is based on a double spiral movement between tacit and explicit knowledge. The SECI model construes knowledge creation within socialisation, externalisation, combination and internalisation. Knowledge creation happens on individual basis, and so, the knowledge created is unique to each student. This could be an explanation for the different scores that different students get after sitting for the same examination.

When knowledge has been created, it has to be stored in a knowledge repository. According to Ekpoh (2011), knowledge storing is the codification of knowledge in knowledge repositories. This repository is first and foremost, the human memory. The limited capacity of the human memory with particular respect to the ability to recall what has been stored in it in a complete and accurate manner as and at when required, makes it necessary to codify what has been created and/or memorised into materials which fall under print or electronic media for example, writing sheets, computer memory, memory sticks, CD/DVDs, etc. In the school environment generally, the codification of knowledge created is done through the act of note-taking. The results of the study of Haghverdi, Biria and Karimi (2010) revealed that note-taking strategy instruction had significant positive effects on student achievement. Taking and reviewing lecture notes are prevalent activities that are related to higher test performance in higher education (Vekaria, 2011). Studies have repeatedly shown a positive correlation between note taking and exam performance (Slotte and Lonka, 1999; Peverly, Ramaswamy, Brown, Sumowski, Alidoost, and Garner, 2007), cited in, Kamauru (2012). Research on note taking indicates that taking notes in class and reviewing those notes (either in class or afterward) have a positive impact on student learning (Muraina, Nyorere, Emana and Olanrewaju, 2014).

Knowledge is not only created and stored; it is also shared. Knowledge cannot be shared in a vacuum rather, it requires a medium. This medium could be physical or it can be a virtual space, shared mindset, or environment that allows for the knowledge to be shared. This aligns with the idea of the ***ba*** (Nonaka and Takeuchi, 1995). Oftentimes, the group of people who meet to share knowledge is termed as a community. Thus, the terms, 'learning communities' and 'communities of practice' could be used. A learning community is defined here as an environment where learners are brought together to share information, to learn from each other, and to create new knowledge. The individual student develops his/her own learning by building on what is learnt from others (Kemp, 2010). The learning community is broken down into groups called communities of practice. A Community of Practice (CoP) is a group of people, along with their shared resources and dynamic resources, who assemble to make use of shared knowledge, in order to enhance learning and create a shared value for the group (Seufert, Von Krogh and Bach, 1999; Adams and Freeman, 2000), cited in, Dalkir (2011). A CoP is a group of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis (Wenger, McDermott and Snyder, 2002). This is a common feature in business and organisational management. However, its close semblance in ODL can be found in tutorial classes as provided in facilities made available by the institution's study centre. Knowledge sharing in tutorial classes fosters social presence. The level of social presence in a distance education setting significantly affects the degree of learning interaction and achievement (Kim, 2011; Wei, Chen and Kinshuk, 2012), cited in, Irani, Wilson, Slough and Rieger (2014). The concepts of equity and social exchange are also vital in understanding knowledge sharing.

Learning is a relatively permanent change in an organism's behaviour due to experience, interaction or exposure to new information or ideas (Afianmagbon and Nwokocha, 2011; Osokoya, 2011). The question as to the duration of time that must elapse before this relatively permanent change can be measure remains unanswered. Thus, this study shall view the completion of four semesters as a fairly long time for change to have taken place in the learner. Consequently, this study shall cover 300 and 400 level undergraduate students of the

NOUN, Benin Study Centre, Edo State, which is an ODL institution, as it seeks to ascertain the contribution of their knowledge management practices to their learning outcomes.

Statement of the Problem

The lingering perception of the learning outcomes of students of ODL institutions as being poor is an issue of concern to stakeholders including the government, school administrators, parents/guardians and employers of labour. With respect to learning outcome, more attention is focused on the academic performance of students. This concern is justified considering the potency of ODL to serve as a veritable means of attaining tertiary education in a country like Nigeria where the carrying capacity of tertiary institutions to absorb all qualified applicants is very low. If this perception persists and aspersions are cast as regards the quality of student learning outcomes of ODL then, the argument for the continued existence of distance learning institutions would become unsustainable. In the light of the above, this study took a look at entire knowledge management process on the part of the students in relation to their learning outcomes in distance education particularly the variant called ODL as exemplified in the NOUN, Benin Study Centre, Edo State solely in its own rights and without any comparative leanings.

Research Questions

In line with the purpose or objectives of this study, the following research questions are set to guide the study.

1. To what extent do students of the National Open University of Nigeria, Benin Study Centre, Edo State:
    (a) create knowledge
    (b) store knowledge
    (c) share knowledge?
2. What is the composite contribution of the knowledge management elements (knowledge creation, knowledge storage and knowledge sharing) to student learning outcomes in the National Open University of Nigeria, Benin Study Centre, Edo State?
3. What is the relative contribution of each of the knowledge management elements (knowledge creation, knowledge

storage and knowledge sharing) to student learning outcomes in the National Open University of Nigeria, Benin Study Centre, Edo State?

4. Which among the knowledge management elements (knowledge creation, knowledge storage and knowledge sharing) is the most potent or influential in predicting the student learning outcomes in the National Open University of Nigeria, Benin Study Centre, Edo?

Methodology

This study adopted the descriptive research design of *ex-post facto* type. The study covered 300 and 400 level students of the five schools as far as undergraduate studies are concerned in the National Open University of Nigeria, Benin Study Centre, Edo State. The total size of the population for the study was 1452 students. This study made use of multi-stage sampling procedure in obtaining its sample. A total of 270 participants were involved in this study and this represented 18.6% of the study population. A questionnaire, titled, 'Knowledge Management and Student Learning Outcomes Questionnaire' (KMSLOQ) was designed to collect information on the student's knowledge management practices as well as their attitudes towards their course of study and ODL as a whole. It is divided into three sections namely, Section A, Section B and Section C. Section A of the questionnaire contained items on students' demographic information. Section B captured the results of the students in their last semester examinations while Section C consisted of 34 items which are subdivided into 7 statements based on the variables being measured. The items were drawn on a four-point Likert rating scale with a response mode of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) carrying the weights of 4, 3, 2 and 1 respectively. Using Cronbach alpha, the reliability coefficient of the instrument was 0.81. In addition, the researcher obtained the results of the last examinations written by the students who fall within the sample to be studied. Out of the 270 questionnaires administered, 265 were returned. The data collected was analysed through correlation statistical analysis using multiple regression analysis. Research question one was answered by computing frequency tables depicting simple percentages. The remaining research

questions were answered using multiple regression analysis and ANOVA. The level of significance for this study is 0.05.

Results and Discussion

Research Question 1

To what extent do students of the National Open University of Nigeria, Benin Study Centre, Edo State:

(i) create knowledge
(ii) store knowledge
(iii) share knowledge?

In answering this question, frequency tables depicting simple percentages were obtained. The results are shown as follows:

S/N	Statements	Frequency (F) and Percentage (%)		Total
	In my academic endeavours:	**Agree**	**Disagree**	
1	I am exposed to new phenomena	255 (96.2%)	10 (3.8%)	265
2	I easily gain understanding by putting together the different things I learn	182 (68.7%)	83 (31.3%)	265
3	I easily develop new ideas in my field of study	195 (73.6%)	70 (26.4%)	265
4	I modify misconceived ideas during my interactions with coursemates	219 (82.6%)	46 (17.4%)	265
5	I am able to build on what I've learnt previously	245 (92.5%)	20 (7.5%)	265
6	I can explain, in my own words, what I've studied.	186 (70.2%)	79 (29.8%)	265
	Average	80.6%	19.4%	

Table 1.1 indicates that the weighted average of the level of participation of the respondents in knowledge creation activities is 80.6%. Specifically, 96.2% of the respondents are exposed to new phenomena in their academic endeavours while 68.7% easily gain understanding by putting together the different things they have learnt. Also, 73.6% of the respondents easily develop new ideas in their

different fields of study while 82.6% modify previously misconceived ideas as they interact with their coursemates. Lastly, 92.5% of the respondents are able to build on what they have previously learnt while 70.2% can explain, in their own words, what they have studied. These findings show that, to a large extent, the students of the National Open University of Nigeria, Benin Study Centre, Edo State create knowledge.

Table 1.2: The extent to which students store knowledge

S/N	Statements	Frequency (F) and Percentage (%)		Total
	In the course of my studies:	**Agree**	**Disagree**	
1	I easily assimilate what I learn	238 (89.8%)	27 (10.2%)	265
2	I remember most of what I learn	245 (92.5%)	20 (7.5%)	265
3	I take notes while studying on my own	241 (90.9%)	24 (9.1%)	265
4	I take notes while I am in tutorial classes	255 (96.2%)	10 (3.8%)	265
5	I enjoy note-taking	222 (83.8%)	43 (16.2%)	265
6	I later review the notes I have taken	230 (86.8%)	35 (13.2%)	265
7	I keep my notes properly	200 (75.5%)	65 (24.5%)	265
8	I have easy access to my notes.	245 (92.5%)	20 (7.5%)	265
	Average	88.5%	11.5%	

The findings in Table 1.2 show that 89.8% of the respondents assimilate what they learn while 92.5% remember most of what they learn. Also, 90.9% and 96.2% of the respondents take notes during independent study and during tutorial classes respectively. In addition, 83.8% of the respondents enjoy note-taking while 86.8% review the notes they have taken, and 75.5% keep their notes properly. Lastly, 92.5% of the respondents have easy access to their notes. The weighted average of the level of participation of the students in knowledge storage activities was 88.5%. This shows that, to a large extent, the students of the National Open University of Nigeria, Benin Study Centre, Edo State store the knowledge they have created.

Table 1.3: The extent to which students share knowledge

S/N	Statements	Frequency (F) and Percentage (%)		Total
	During tutorial classes organised for my class:	**Agree**	**Disagree**	
1	I am often present	191 (72.1%)	74 (27.9%)	265
2	I am with my course materials	241 (90.9%)	24 (9.1%)	265
3	I am with my writing materials	251 (94.7%)	14 (5.3%)	265
4	I ask questions	230 (86.8%)	35 (13.2%)	265
5	I answer questions	236 (89.1%)	29 (10.9%)	265
6	I make contributions	240 (90.6%)	25 (9.4%)	265
7	I learn a lot.	246 (92.8%)	19 (7.2%)	265
	Average	88.1%	11.9%	

Table 1.3 reveals that the weighted average of the level of participation of respondents in knowledge sharing activities was 88.1%. The breakdown shows that 72.1% of the respondents are often present in tutorial classes; 90.9% and 94.7% of the respondents attend their tutorial classes with their course materials and writing materials respectively. Furthermore, 86.8% and 89.1% of the respondents ask and answer questions during the tutorial classes respectively. Also, 90.6% of the respondents make contributions during tutorial classes and 92.8% learn a lot by virtue of the tutorial classes organised for them. Consequently, it can be argued that, to a large extent, the students of the National Open University of Nigeria, Benin Study Centre, Edo State share knowledge among themselves.

Research Question 2

What is the composite contribution of the knowledge management elements (knowledge creation, knowledge storage and knowledge sharing) to student learning outcomes in the National Open University of Nigeria, Benin Study Centre, Edo State?

To provide an answer to this question, multiple regression analysis of student learning outcome of distance learners on knowledge

management elements was carried out, and the result is shown in Table 1.4.

Table 1.4: Summary of regression of student learning outcomes on knowledge management elements

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.456	0.208	0.199	3.221

Table 1.4 shows that the three knowledge management elements have a joint multiple correlation which is positive with student learning outcomes (R=0.456). The implication of this is that the three knowledge management elements are quite relevant in determining the student learning outcomes in the National Open University of Nigeria, Benin Study Centre, Edo State. Furthermore, the table reveals that the three elements explained about 20.8% of the total variance in the student learning outcomes in the National Open University of Nigeria, Benin Study Centre, Edo State (R Square = 0.208). The remaining 79.2% is due to other factors (excluded from the elements of the independent variable in the present study) and residuals.

However, in a bid to determine whether or not the R Square value of 0.208 obtained is significant, the Analysis of Variance (ANOVA) was performed. The result of this is shown in Table 1.5.

Table 1.5: Analysis of Variance of the Regression Analysis

Source of Variance	Sum of Squares	Df	Mean Square	F	Sig.
Regression	712.127	3	237.376	22.878	0.000
Residual	2708.009	261	10.376		
Total	3420.136	264			

Table 1.5 shows that the R Square value obtained from the regression analysis is significant ($F=22.878$; $p<0.05$). This means that the R Square value of 0.208 is not due to chance.

Research Question 3

What is the relative contribution of each of the knowledge management elements (knowledge creation, knowledge storage and

knowledge sharing) to student learning outcomes in the National Open University of Nigeria, Benin Study Centre, Edo State?

The parameter estimate of the relative contributions of the knowledge management elements to student learning outcomes in the National Open University of Nigeria, Benin Study Centre, Edo State was shown in Table 1.6

Table 1.6: Relative contributions of the knowledge management elements to student learning outcomes

S/N	Knowledge Management Elements	Unstandardised Coefficients		Standardised Coefficients		
		B	Std. Error	Beta (β)	t-value	Sig
	(Constant)	16.081	2.545		6.318	0.000
1	Knowledge creation	0.282	0.094	0.173	3.017	0.003
2	Knowledge storage	0.245	0.077	0.188	3.165	0.002
3	Knowledge sharing	0.366	0.08	0.271	4.591	0.000

*Sig. ($p<0.05$)

Table 1.6 reveals that the beta (β) weights of the knowledge management elements give the estimates of the strengths of the contributions of each of them. The entire knowledge management elements were found to contribute differentially to the student learning outcomes in the National Open University of Nigeria, Benin Study Centre, Edo State. In ascending order of the magnitude of contribution to the student learning outcomes shows that knowledge creation ($\beta=0.173$; $p<0.05$) is followed by knowledge storage ($\beta=0.188$; $p<0.05$) and knowledge sharing ($\beta=0.271$; $p<0.05$). The standardized coefficient values indicate that knowledge creation had a contribution of 17.3% to the student learning outcomes while knowledge storage had a contribution of 18.8% to the student learning outcomes and knowledge sharing had a contribution of 27.8% to the student learning outcomes.

Furthermore, a unit change in the student learning outcomes leads to a 0.282 (unstandardized B) change in knowledge creation element keeping other variables constant. In the same vein, a unit change in the student learning outcomes leads to a 0.245

(unstandardized B) change in knowledge storage element keeping other variables constant while a unit change in the student learning outcomes leads to a 0.366 (unstandardized B) change in knowledge sharing element keeping other variables constant.

Research Question 4

Which among the three knowledge management elements is the most potent or influential in predicting the student learning outcomes in the National Open University of Nigeria, Benin Study Centre, Edo State?

Table 1.7 presents the answer to this question.

Table 1.7: **Most potent knowledge management element contributing to student learning outcomes**

S/N	Knowledge Management Elements	Unstandardised Coefficients		Standardised Coefficients			
		B	Std. Error	Beta (β)	t-value	Sig	Rank
	(Constant)	16.081	2.545		6.318	0.000	
1	Knowledge creation	0.282	0.094	0.173	3.017	0.003	3rd
2	Knowledge storage	0.245	0.077	0.188	3.165	0.002	2nd
3	Knowledge sharing	0.366	0.08	0.271	4.591	0.000	1st

*Sig. ($p<0.05$)

Table 1.7 reveals that knowledge sharing ($\beta=0.271$; $p<0.05$) is the most potent knowledge management element in predicting the student learning outcomes in the National Open University of Nigeria, Benin Study Centre, Edo State.

Discussion of Findings

The findings of the present study revealed that the weighted average of the levels of participation of the students (in the National Open University of Nigeria, Benin Study Centre, Edo State) in knowledge creation, knowledge storage and knowledge sharing were 80.6%, 88.5% and 88.1% respectively. This shows that these students, to a large extent, participate in knowledge creation, knowledge storage and

knowledge. Likewise, the three knowledge management elements namely knowledge creation, knowledge storage and knowledge sharing, when taken together, accounted for 20.8% of the variance in the student learning outcomes in the National Open University of Nigeria, Benin Study Centre, Edo State. This underscores the importance of the explanatory variable to the criterion variable.

With regard to the relative contribution of each of the elements of the explanatory variable to criterion variable, the findings from the present study indicated that knowledge sharing made the highest contribution to the student learning outcomes in the National Open University of Nigeria, Benin Study Centre, Edo State ($\beta=0.271$; $p<0.05$). This is in line with the work of Irani *et al.,* 2014 who cited Kim (2011) and Wei, Chen and Kinshuk (2012) and asserted that the level of social presence in a distance education setting significantly affects the degree of learning interaction and achievement. In descending order of magnitude the next ranking knowledge management element is knowledge storage ($\beta=0.188$; $p<0.05$). The findings of this study corroborates the reports of previous studies which revealed that note-taking strategy instruction (Haghverdi, Biria and Karimi, 2010), taking and reviewing lecture notes (Vekaria, 2011; Muraina, *et al.*, 2014) had significant positive impacts on student achievement. Knowledge creation was found to have the least contribution to the student learning outcomes in the National Open University of Nigeria, Benin Study Centre, Edo State ($\beta=0.173$; $p<0.05$). The indication that knowledge creation has the least contribution to student learning outcomes is a curious one. This however, could be a pointer to the need for subsequent studies to assess the relevance, appropriateness, recency, language, interactiveness, availability and access of the course materials provided by the institution.

Consequently, knowledge sharing was found to be the most potent knowledge management element in predicting student learning outcomes. This accentuates the assertion that learning is enhanced by social interaction as it is essential for knowledge construction and also allows students to verify their understanding (Cooperstein and Kocevar-Weidinger, 2004). The importance of the CoP (Babalola, 2011) and the ***ba*** (Nonaka and Toyama, 2003) emphasises the viewpoint that knowledge is not shared in a vacuum, rather it has to be shared in space. It must be noted that there is a high possibility that knowledge

sharing would have had a better contribution to student learning outcomes in the National Open University of Nigeria, Benin Study Centre, Edo State if the facilitators were well trained and if the environment for tutorial classes were more conducive. It was observed during the administration of the research instrument for this study that tutorials were not held online, and so, was fully based on physical presence. The effects of noise pollution and the absence of conducive learning environment could have inhibited the contribution of knowledge sharing to the student learning outcomes in the National Open University of Nigeria, Benin Study Centre, Edo State. The absence of a conducive learning environment is predicated on assessment criteria like inadequate seats and inadequate lecture rooms as tutorial classes were taking place in corridors and under staircases as the lecture rooms were insufficient to accommodate all the available students.

Conclusion

The three knowledge management elements investigated in this study contributed considerably to the student learning outcomes in the National Open University of Nigeria, Benin Study Centre, Edo State. The contribution of the knowledge management elements to student learning outcomes is not accidental. However, the elements were found to have varying strengths of contribution to student learning outcomes. For instance, knowledge sharing made the strongest contribution to student learning outcomes. This is not unrelated with the postulation that learning is enhanced by social interaction.

Recommendations

Based on the findings and the conclusions reached, some recommendations were made with a view to improving the student learning outcomes in the National Open University of Nigeria, Benin Study Centre, Edo State. The recommendations are:

- Students should be encouraged to pay attention to the knowledge management elements viz., knowledge creation, knowledge storage and knowledge sharing. They should be intimated with the importance of knowledge sharing as it affords them the opportunity to clarify misconceived ideas, and also gain a better understanding of what is being studied.

- Facilitators should always exhibit a positive attitude towards distance leaners as this in turn will boost their attitudinal dispositions towards they programme being undertaken. In addition, they should be conscious of their roles as 'facilitators' and not 'teachers' so to speak as this will engender active participation of distance learners and bring out the best in them.
- Regular seminars, workshops and interactive sessions should be organised for the distance learners so as to help the distance learners better manage the knowledge at their disposal so as to enhance their learning outcomes. This will make students better appreciate the relevance of knowledge management practices. Also, regular trainings and workshops should be organised for the facilitators to help them improve on their skills as they relate to helping the students manage knowledge.

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