

Innovation for Transformation in Nigeria University Education: Implications for the Production of Critical and Creative Thinkers

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This descriptive survey research studied innovation for transformation in Nigeria university education: implications for the production of critical and creative thinkers. Thus, students' perception of knowledge generation and dissemination by university lecturers were elicited. From a population of registered students in a Nigerian university, 200 third-year students were selected from five departments of the institution using simple random sampling techniques. Two research questions were posed, while three hypotheses formulated to guide the study. QACU (Questionnaire for Assessing Creative Teaching in Universities) was constructed, validated and used for data collection. The collated data were analyzed using percentage, mean and *t*-test statistic. The results showed that most of the teachings currently going on in Nigerian universities are left brained, rely more on written and oral modes of testing than on projects and use more lecture method of delivery than technology-assisted means. It was recommended that there is the urgent need to review both the curriculum of the tertiary institutions, retrain the teaching staff to use both brains and technology in teaching and train the students to do the same.

Keywords: education, psychology, sociology

Introduction

Knowledge is said to be the best possible basis for managing the human intellectual processes and resources for development. Knowledge, which is the ability to know, recall, be aware of experience and understand, ensures that human abilities, composed of many logical interrelationships, are organized in a single comprehensive system. Hence, Guilford (1977) in his structure of the intellect model reflected principles that help to show the roles ability play in controlling mental operations for increased balance functioning. Furthermore, the utilization of abilities, critical and creative thinking have been said to lead to their development. Subsequently, skills are learnt and improved upon in problem-solving situations. All these are possible, however, via the utilization of a well developed educational system and process.

Education is a system deliberately designed to equip individuals with the desired knowledge, skills and attitudes, which will help them, live worthy and happy lives in the society (Nwafor, 2007). Education then is

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saddled with the responsibility to ensure that people do not just pass through its walls, but that they also acquired the ability to analyze, see relationships, make accurate judgment, learn to lead and follow, think critically and creatively, use scientific methods and be involved in problem-solving (Onu, 2008).

The role of the educational system in training its citizens would also include the use of educational innovations to develop skills, gifts, abilities and capabilities of citizens, so they can function and ensure innovation and transformation of the world in which they live. Innovation, which is the generation, acceptance and implementation of new ideas, processes, methods and changes, most often leads to the introduction of transformation. Innovation also leads to persistent changes in the patterns of behavior of members of an identified social system. It equally leads to such departure from the normal cultural practices that a sustained reform or transformation is noticed (Nwafor, 2007).

Transformation is a process of transmutation from one state to another. It can apply to an individual or organization, or the product or service supplied by an organization. Harvey and Green (1993) opined that it is the process of changing from one qualitative state to another. It defines quality, focuses on process, the enhancement and empowerment of the learner, especially when transformation is related to higher education. The learners are said to be better positioned to provide transformative outcome that is transformative learning and research.

Higher institutions otherwise referred to universities that has its major function, which is the obligation to empower students with specific skills, knowledge and attitudes that will enable them live and work in the knowledge society (Campbell & Rozenyai, 2002). Furthermore, quality delivery of a transformational quality approach has been said to involve key elements, according to Harvey and Knight (1996), which can be summarized, thus:

- (1) Envisioning quality as a transformational process designed to enhance experience of students;
- (2) A bottom-up approach to continuous improvement;
- (3) Responsiveness and openness as the means of gaining greater trust;
- (4) Emphasizing effective action;
- (5) External monitoring which is sensitive to internal procedures and values.

The challenge, however, remains how to measure the quality of transformation in terms of intellectual capital (Lomas, 2002; Harvey, 2004). Furthermore, every university has the obligation to provide transforming experiences for their students so that they can take themselves as a leading role in transforming their society. The question, however, is how organized and prepared are the teachers who are supposed to be the initial agent of transformation?

In a research conducted by Eze (2005) on the knowledge update of Nigerian Academics: A case study of Enugu State University of Science and Technology, it was reported that out of the 145 lecturers from 33 academic department studied, a low grand mean of 2.64 as against the accepted minimum of 3.0 was reported to indicate that lecturers do not have access to current journals and textbooks, thereby, making it difficult for them to update their knowledge. Furthermore, though it was found out that a good number of them do attend conferences, they do not necessarily embark on academic researches as a means of updating their knowledge in their areas of specialization. The use of these facilities of information and communication technology to maintain awareness and remain current in their field of specialization was equally found to be low making the reliance on the lecturers as effective agents of transformation a mere dream. Simply stated, if teachers who are to be the pivot of educational process are less informed, how can the blind lead the blind?

The demand for skillful, critical and creative thinker is on the increase in various fields of human endeavors. Critical thinking, which is one of the bedrocks of academic achievement not only aid in the manipulation of information to form concepts, it also helps in problem set-up and decision-making (Onu, 2001; Lahay, 2003; Ogbe, 2008). These higher order processes enable the user to compare, categorize, decode, identify and analyze. Information given in the classes is utilized in assessing the authenticity, accuracy and worth of knowledge claims and beliefs. The individual learner then does not just absorb all, but reflect, assess and judge in order to know what to accept and believe. This purposeful self-regulatory judgment makes clear allowance for the learner to interpret, analyze, evaluate and make inference. Judgment is equally taken through thorough explanation of the evidential, conceptual, methodological, criteriological or contextual considerations (Facione, 1990).

The current tradition of teaching and learning in Nigerian universities does not involve the production of student with such reflective style of thinking. The system, while stressing teaching, has an underling philosophy of producing rote learners with narrow loci and mere conformists who rarely are inclined to be exposed to the type of education that will help them develop awareness of development related issues and the savior-faire in terms of knowledge, values, attitudes, skills and behaviors that ensures sustainable development. Yet, the target of every university skill remains the production of individuals who have the ability to create products characterized by originality of thought, show imagination or the ability to stimulate the imagination.

The strongest asset a nation has is in the thinking and inventiveness of the people with the ideas gotten. Creativity forms the bases of knowledge capital, which in turn feeds the growth of industry and commerce. Hence, the importance of teaching creativity, which is the practical utilization of the brain in thought and activities.

Research Questions

Two research questions guided the study:

- (1) To what extent do lecturers utilize technology and other relevant materials in their delivery of lectures?
- (2) What is the extent to which students' assessment modalities encourage the production of creative products?

Hypotheses

Three hypotheses posed for the study were tested at the significant level of 0.05.

- (1) There is no significant difference in university lecturers' utilization of technology and other relevant materials in delivery of lectures;
- (2) There is no significant difference in students' production of creative products, due to the assessment modalities;
- (3) There is no significant difference in the lecturers' use of creative, analytical skills or both in lecture delivery.

Method

Descriptive survey, the research design for this study, was employed in eliciting students' opinion of knowledge generation and lecture delivery and its implication for innovating a transformation in Nigeria university education.

Participants

The population for the study consisted of all the registered students in the University of Nigeria, Nsukka, a first generation university located at Nsukka, one of the 17 local government areas in Enugu State. Nsukka is home to many other institutions of higher learning, such as Federal College of Education Eha-Amufu, the College of Education, Nsukka, Garnet Polytechnic Nsukka, Enugu State University of Science and Technology (Mature programme) and National Teacher Institute (Nsukka study center), among other distance learning institutions. The sample size of 200 third-year students was constituted for the study by randomly selecting five departments, and then students from the departments (Mass communication, educational foundations, English, biological science and public administration) using simple random sampling technique of simple toss of the coin.

Instrument

QACU (Questionnaire for Assessing Creative Teaching in Universities) used for data collection was constructed by the researchers to elicit responses on the lecturers' method of teaching, their quality and type of assessment given to students, and the lecturers' utilization of the right brain in creative teaching. Thus, the questionnaire has three sub-sections of A, B and C for method of teaching, type of assessment and creative teaching style respectively. The instrument was face validated by experts in science education and measurement and evaluation, whereas 0.71 reliability index was obtained using Cronbach procedure.

Procedure

The researchers administered QACU to students in the sample departments, who filled and submitted the instrument in the range of two to five days. Although some questionnaires were lost, yet the time span offered them sufficient time to obtain some of the required data, such as number of tests (tests here also include examination) written per course in 2009/2010 academic year. The responses were measured using a four point Likert scale of: Very often (4), Often (3), Sometimes (2) and Never (1). The decision rule was determined at 2.50 by obtaining the mean score of the scoring values. Thus, each item mean less than, or above 2.50 decision rule was either rejected or accepted.

Statistics

Percentage and mean statistics were used to answer the research questions, while *t*-test statistic was employed in hypothesis testing.

Results

The results of the study are presented in tables according to the research questions and hypotheses.

Research Question 1: To What Extent, Do Lecturers Utilize Technology and Other Relevant Materials in Their Delivery of Lectures?

Data displayed in Table 1 show that university students in the five sample departments obtained highest percentile scores (71.2, 70.9, 90.6, 70.8 and 80.5) in the use of lecture style for lecture delivery only (without technology), while 28.8, 29.1, 9.4, 29.2 and 19.5 percents were obtained on utility of technology during lectures. In addition to the high mean scores (4.1, 3.8, 5.2, 4.9 and 5.0) obtained on lecture method, these data seems to suggest that university lecturers relied more on lecture method of delivery than on innovative use of information and communication technologies.

Table 1
Mean and Percentage Ratings of Lecture Delivery in Departments

Department	Mass communication			Educational foundations			English			Science			Public administration		
	<i>N</i>	%	<i>M</i>	<i>N</i>	%	<i>M</i>	<i>N</i>	%	<i>M</i>	<i>N</i>	%	<i>M</i>	<i>N</i>	%	<i>M</i>
Tech	57	28.8	2.0	45	29.1	1.2	32	9.4	1.9	40	29.2	1.6	26	19.5	0.07
Lect.		71.2	4.1		70.9	3.8		90.6	5.2		70.8	4.9		80.5	5.0

Notes. *N* = number of students; *M* = mean score; % = percentage score.

Research Question 2: What Is the Extent to Which Students' Assessment Modalities Encourage the Production of Creative Products?

Figures displayed in Table 2 indicate that 54%, 66%, 56%, 74.5% and 75% of 49, 46, 39, 52 and 47 total tests given to students in the sample departments were in written form. While 31%, 23%, 32%, 25% and 20% were oral tests, 15%, 11%, 12%, 0.5% and 5% were in project forms. In addition to the high mean scores, this result seems to suggest that Nigerian university students do more of written based tests and less of project based assessment.

Table 2
Mean and Percentage Ratings of Students' Assessments and Creative Products

Department	Mass communication			Educational foundations			English			Science			Public administration		
	<i>N</i>	%	<i>M</i>	<i>N</i>	%	<i>M</i>	<i>N</i>	%	<i>M</i>	<i>N</i>	%	<i>M</i>	<i>N</i>	%	<i>M</i>
Written		54	4.2		66	4.6		56	3.0		74.5	5		75	4.8
Oral	49	31	2.9	46	23	3	39	32	2.4	52	25	3.1	47	20	2.6
Project		15	1.7		11	1.8		12	0.09		0.5	1.2		5	1.0

Notes. *N* = number of tests; *M* = mean score; % = percentage score.

Hypothesis 1: There Is No Significant Difference in University Lecturers' Utilization of Technology and Other Relevant Materials in Delivery of Lectures

Data presented in Table 3 indicate that there is a significant difference in university lecturers' utilization of technology and other relevant materials in their delivery of lectures. This is because the *t*-computed value of 6.296 is greater than the *t*-critical of 0.013 at the significance level of 0.05. Thus, the null hypothesis of no significant difference in university lecturers' utilization of technology and other relevant materials in delivery of lectures is rejected difference.

Table 3
Test Scores on Method of Lecture Delivery

	Mean	Standard deviation	<i>t</i> -value	Differences	Sig. (two-tailed)
Delivery method (Use of ICT—Lecture)	2.300	6.296	2.583	49	0.013

Hypothesis 2: There Is No Significant Difference in Students' Production of Creative Products Due to Their Assessment Modalities

Inferring from data shown in Table 4, there is a significant difference in students' production of creative products due to their assessment modalities. This is because of the *t*-computed score of 14.25, which is apparently higher than the *t* critical value of 0.000 obtained at the significant level of 0.05. Thus, the null

hypothesis of no significant difference in students' production of creative products, due to their assessment modalities, is rejected.

Table 4

Scores on Students' Assessment Modalities in Five Departments

	Mean	Standard deviation	<i>t</i> -value	Differences	Sig. (two-tailed)
Assessment modalities (Oral and written—Project)	14.694	6.187	14.251	35	0.000

Hypothesis 3: There Is No Significant Difference in the Lecturers' Use of Creative, Analytical Skills or Both in Lecture Delivery

Inferring from presented data in Table 5, there is a significant difference in lecturers' use of creative, analytical skills or both in lecture delivery. This is due to the *t*-computed value of 5.16 obtained at the significant level of 0.05, which is greater than the *t*-critical value of 0.000. Thus, the null hypothesis of no significant difference in the lecturers' use of creative skills in lecture delivery is rejected.

Table 5

Scores on Teaching Styles in Five Departments

	Mean	Standard deviation	<i>t</i> -value	Differences	Sig. (two-tailed)
Teaching styles (Creative—Analytical)	0.941	1.302	5.160	50	0.000

Discussion

The findings of this study indicate that there is a significant difference in lecturers' use of creative skill, analytical skill or both in lecture delivery. This research has confirmed that more of educational activities that are currently going on in tertiary institutions are convergent, intellectual, logical, temporal, analytical, directed, sequential, objective and fixed. This finding is in line with Onu (2008), Nwafor (2007), Campbell and Rozenyai (2002), Harvey and Knight (1996) and Guilford (1977). Guilford, just like the others, agreed that ability play roles in controlling mental operations for increased balance functioning. When trained in these higher order processes, the users are enabled to compare, categorize, decode, identify and analyze. Information given in the classes is utilized in assessing the authenticity, accuracy and worth of knowledge claims and beliefs. The lecturers rarely lend themselves to some of the activities that are non-verbal, divergent, spatial, imaginative, multiple, gestalt and divergent.

Therefore, the educational systems as they are presently constituted are accused of emphasizing left-brain thinking to the neglect of the right brain. The consequence being the development of half-mental capacity of students, teaching of unconnected fragments, results in an individual's inability to deal with simultaneous problems associated with human lives (Onu, 2005). While the left-brain, which is needed for critical thinking, may be emphasized, creative and intuitive insights that will help students search for new patterns, create new things and invent, were grossly ignored. The tertiary institutions, which should be about knowledge generation and dissimulation, innovation and transformation, are, therefore, described as sterile and doomed.

The results have equally shown that there is a significant difference in students' production of creative products due to their assessment modalities. The students opined that they hardly had time to interact with other Nigerian universities academically, hardly used current information and are not vast in the use of information

technology (like the internet for research). Nigeria students like other students in the world need tools that will make them effective problem solvers. In agreement with this statement, Onu (2001), Lahay (2003), Ogbe (2008) and Gibbons (1998) posited that globalization has made it essential that individuals is trained to be effective problem solvers, generators and configuration of knowledge that will lead to human resource development and capacity building. Hence, the role of tertiary institutors is considered to be critical to social progress and economic growth. These are the key factors in national development.

This study also found that there is a significant difference in university lecturers' utilization of technology and other relevant materials in their delivery of lectures. This finding is in line with Eze (2005) who researched on the knowledge update of Nigerian academics: A case study of Enugu State University of Science and Technology, who observed that lecturers do not necessarily embark on academic researches as a means of updating their knowledge in areas of specialization. The use of these facilities of ICT (information and communication technology) to maintain awareness and remain current in their field of specialization was equally found to be low, making the reliance on lecturers as effective agents of transformation a mere dream.

Higher institutors are places marked for high intellectual functioning, divergent and convergent thinking, elaboration, transformation and evaluation of knowledge, and traits said to be trainable (Johnson, 1986). The lecturers who are expected to be professional teachers are considered as the pivot of educational processes and the strategic position that they occupy in the education process is very critical. Their actions or inaction, lack of relevant skills (such as ICT skill), therefore, can make irreparable loss or gain (Ukeje, 1991). In agreement with the above statement, Anikweze (1995) affirmed that the difference between talking and chalking lies on the teachers' dedication, determination and discipline.

The implication of the above includes the need to ensure that the knowledge components and professional skills and practices are included in school to ensure that student demonstrate new knowledge, innovation and subsequently are set to transformations. They are also expected to interact with their environment, using original notions, ideas, skills and subsequent experiences to explore experiment and construct new knowledge, which are activities in both art and sciences. The perceptual and cognitive skills culminate in mind mapping that assist the brain to generate new ideas, organize and remember later. The visual and verbal methods that are currently being utilized to plan project, brainstorm and write letters in tertiary institutions in developed countries are the main functions of left and right hemisphere of the brain. Hence, the need to train lecturers is to utilize then effectively.

Conclusions

The role of the tertiary institutions in teaching, carrying out research and other services to the community and ensure development is currently lacking in most developing nations. This paper has, therefore, highlighted the need for continued high intellectual functioning, divergent (right-brain) and convergent (left-brain) activities, elaboration, transformation and evaluation of knowledge as very important activities students must undergo during their periods of training. The lecturers who are pivots of such activities are, therefore, expected to include innovative teaching research and survey of information processing and transformation in the tertiary institution. Retraining of lecturers in the Nigeria universities to acquire these skills has become imperative from the results of this study.

Recommendations

The researchers, therefore, make the following recommendation:

(1) There is the need to extend the results of quantity and quality of research carried out within the universities to obstacles and constraints of funding, and participation/dissemination of implications of findings to the entire populace. The results can aid in policy decisions for national development;

(2) Lecturers must contribute to the development of the nations. They are expected to exhibit their worth base on contribution they make to the private sectors, the government and their nation. As learned fellows, they are expected to be articulate, enough to aid in perceiving, identifying and expressing the needs of their environs;

(3) Lecturers must generate knowledge, and apply strategies for restoration of normalcy and eradication of chaotic and unscientific situations in the nations through research and extension services;

(4) There is the urgent need to review both the curriculum of the tertiary institutions, plan to retrain the teaching staff to use both brains in teaching and train the students to do the same.

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