Assessing Students' Competency And Practical Learning Ability In A Distance Learning Environment*

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Abstract

The National Open University of Nigeria (NOUN) operates an exclusively open and distance learning (ODL) mode of education whereby students study mostly by reading printed course materials. Practical activities including tasks, exercises, experiments and other activities that involve doing things practically are integrated in the course materials to support student learning. Because distance learners are physically separated from their tutors, we do not know whether or not they actually carry out these practical activities they are expected to complete. This study was conducted to ascertain the competency level of NOUN students in terms of the extent to which they have attained mastery of practical activities embedded in their course modules. We adopted descriptive survey design and employed multi-stage stratified sampling technique to select 283 third-year undergraduate students to perform practical tasks. In addition, 43 copies of printed course materials in which the practical tasks were extracted, together with 43 subject specialists who assessed students' performance, formed sample for the study. Students' performance was assessed against a set of 9 pre-determined criteria all of which were rated on a 4-point scale (1=poor to 4= excellent). Data collected were analyzed using basic descriptive statistics. Findings revealed that students generally demonstrated low level of competency in the performance of their tasks. However, of the 9 criteria, students demonstrated highest mastery in accuracy and logical reasoning followed by clarity, application and sequence of ideas in that order. The least attained competency was self-learning followed by coverage and problem solving. Further findings revealed that 84 (29.7%) of sampled students appeared not to have mastered the practical skills prescribed in their course modules as opposed to 199 (70.3%) who appeared to have acquired some level of practical skills. The findings of the study suggest the need to focus support services aimed at helping learners to engage actively in the learning process.

Background To The Study

Open and distance learning (ODL) has developed over the years from a modest and inconsequential beginning to become a veritable medium for widening access to learning. The 21st century has been widely described as the 'knowledge era', as information technology exerts a profound influence on human interaction so much that the world is transformed into a global village. Nigeria, as one of the world's developing nations has embraced ODL as an emerging mode of educational delivery. With the recognition given to ODL and subsequent establishment of the National Open University of Nigeria (NOUN), there is a new approach to teaching and learning as substantial population of the students are known to be working and learning in accordance with the motto of the institution "work and learn". By this form of learning, Jegede (2005) observed that students would enjoy the opportunity of working and learning at the same time without one activity negatively affecting the other. Programmes that are built on skills and knowledge are thus the main focus in ODL. Generally, the learners' concern is to acquire skills from their studies, which they can subsequently apply in their places of work and businesses. This made NOUN to introduce courses that are relevant to market needs thereby creating access for worker-students of different categories to enhance movement towards professional growth.

Olakulehin (2009) citing Manjulika & Reddy (2002) observed that nations that do not inherit skilled human resources and technological infrastructures are unable to develop knowledge industries and cannot participate in the global knowledge economy. Such nations stagger under the strain of widespread poverty, unemployment, increased social hardship as well as public unrest. In addition, the economy suffers continuous decline and basic human needs are increasingly unmet at both local and national levels. Thus, the need to produce graduates to meet the requirements of employers has been highly recognized (Lim et al, 2011).

In the developing world, there is an undeniable dependence on the print for course material delivery. This is the case for NOUN. The technology resources needed for implementation of the latest forms of hi-tech learning environments are still rare in most parts of Africa, particularly Nigeria where the ICT infrastructure is often fragile, and the availability of electrical power cannot always be relied upon. NOUN operates an exclusively ODL mode of education and employs a range of course delivery methods, including audio visual tapes, CD-ROMs, and radio broadcasts, but most of the course materials are for the time being distributed and used in the form of printed modules as the principal medium of instruction in addition to face-to-face tutorial sessions. Since the learner is at a distance, the course materials serve as the teacher for the learner. Thus, course materials are the vital tools used in instructional delivery. These materials are based on the principles of learning theories with the aim to create desirable conditions that will facilitate effective self-learning (Rahman, 2006). This means that students are notified of the skills they are expected to have by the end of a unit, and then the course content is created in a way that ensures learners will acquire the skills and competencies necessary to compete in the 21st century knowledge economy which will prepare such learners to respond to increasing demands of the working life.

NOUN currently offers over 50 programmes of study composed of over 1,000 courses. There is a course description for each course within the programme. Each course has a study material written specifically for that course, which students are expected to study. The university has its own instructional design process, which is incorporated in the design and development of course materials. Course writers are selected from both in-house academics and other academics from conventional universities and trained to develop course materials. The course writers are expected to: analyze the course description, break it into appropriate unit topics, write appropriate learning objectives for each unit topic, select relevant content to attain these objectives, break down the content in small chunks and design relevant assignments/ activities to assess learners' attainment of stated objectives. Because of the physical separation of learners from their tutors, the learning materials are designed to be self-instructional.

As an essential component of ODL programme, practical activities including, tasks, exercises, experiments and other activities that involve doing things practically are integrated in the course materials to support student learning. Because of the unique nature of distance learners, we do not know whether or not students actually carry out practical activities they are expected to complete. This study was conducted to ascertain the extent to which NOUN students have attained mastery of practical activities embedded in their course modules. Understanding student learning outcome in this regard is essential because learners are the direct beneficiaries of the system and their competencies would be used in the overall functional assessment of the entire system as well as their workplace performances. Again, attention is drawn to the fact that much of the research investigating student learning outcome has focused primarily on academic performance, which is generally related to cognitive domain (e.g. Daymount and Blau, 2008; Oladejo, Ige, Fagunwa, and Arewa, 2010; Bowa, 2011). However, little research has been devoted to exploring student learning outcome at the psychomotor domain. Part of the aim of this study is to contribute to addressing this gap. For the purposes of this study, psychomotor skills/activities refer to learning that involves practical work and learning by doing.

Importance of practical knowledge

Important developments in society in the past decades have led to a different view of knowledge, accompanied by an increased attention for the acquisition of competencies and competence-based education and training (Kearns, 2001). Kouwenhoven (2003) notes that the major aim of education and training has shifted from only the acquisition of knowledge to acquisition and application of the right knowledge. He further notes that the

development of knowledge is taking place in more diverse contexts with emphasis on production of knowledge in the context of application.

The 21st century knowledge economy demands that learners acquire skills and competences to be able to function in their day-to-day lives. In developing countries, specifically in the context of Nigeria, the need for practical skills development has been gaining importance. Distance teaching texts, through the use of activities, can actively promote learning (Lal, 1979). Such activities include all the exercises, assignments, and practical work the distance learners are asked to complete. Practical activities involve doing things practically such as skills performed by hand (as in separating the white and yolk of an egg). Millar (2004) defined practical work as any teaching and learning activity, which involves at some point the students in observing or manipulating real objects and materials. In face-to-face teaching, active learning takes place quite easily because the teacher is physically present to guide, assist, motivate, and stimulate the students to think and make responses (Lal, 1979). In distance education, on the other hand, students do not have regular access to a teacher but have to study mostly by reading printed materials. They may be tempted to respond passively to such materials without carrying out practical activities they are expected to complete (Lal, 1979). Such a passive response can in turn militate against active learning and consequently reduction in acquisition of practical skills/knowledge.

Practical activities in distance teaching materials are considered important because they serve a number of useful purposes that help in promoting active learning. According to Lal (1979), engaging in practical activities enables learners to:

1. Reinforce the information learned
2. Monitor their progress by finding out their weaknesses and by identifying the areas they need to revise further
3. Identify the important facts to be learnt, since activities normally centre on the important aspects of the content
4. Increase their motivation from the satisfaction they derive from completed work.

Elsewhere, it was reported that practical knowledge can often lead to a deeper understanding of concepts through the act of doing and personal experience. The importance and significance of practical knowledge have already been pointed out in the literature (Reckwitz, 2002; Dosi, Nelson and Winter, 2002; Schatzki, Knorr-Cetina and Von Savigny, 2001). As earlier commented, one of the characteristics of distance education is the physical separation between teacher and students. This condition according to Pepi and Malati (2012) requires distance education institutions to have learning strategies that can support learning competency in terms of knowledge and practical skills.

Theoretical and Conceptual Framework

The theoretical framework for this study is based on constructivist learning theory. The theory maintains that learning is an active process in which learners actively construct new ideas or concepts based upon their current or past knowledge. The learner selects and transforms information, constructs hypotheses, and makes decisions, relying on a cognitive structure to do so. One feature of the constructivist paradigm explains that individuals construct their own meaning and knowledge by actively engaging in the learning process. Constructivist theory acknowledges the learner's active role in the personal creation of knowledge and the importance of experience in this knowledge creation process. It is known that the quality of the acquired knowledge through active construction is better than passively gained knowledge. The constructivist perspective was advanced by theorists such as Piaget (1973) and Vygotsky (1978). Although their works vary greatly, each articulates a similar context of learning and development. The theory is relevant to the study in the extent that it considers students learning by doing as key to construction of knowledge.

The conceptual framework of the study shows the symbiotic relationship between the various constructs of the study (course material content, the learner, learning process) and how these impact on learning output. It depicts the relationship between course content, the learner who constructs knowledge by working and

transforming information passed to them based on the learning material content and the manner in which the learner interacts with the content presented in the course materials, and the end result of such interaction. Learner-content interaction is considered an important component of the learning process (Vrasidas, 2000). The best education is said to be a combination of two things – the mastery of the basic theories and principles in one's chosen path, and the skilful application of the former. As active participants in the learning process, students affect the manner in which they deal with the course material to be learned and which in turn affect output. Students who fail to carry out practical activities, which they are expected to complete, will lack the requisite practical skills/knowledge needed to empower themselves. On the other hand, students who actively engage in the learning process by carrying out practical activities will acquire practical skills/knowledge to enable them function effectively in their day-to-day lives. The conceptual framework is represented in figure 1 below:

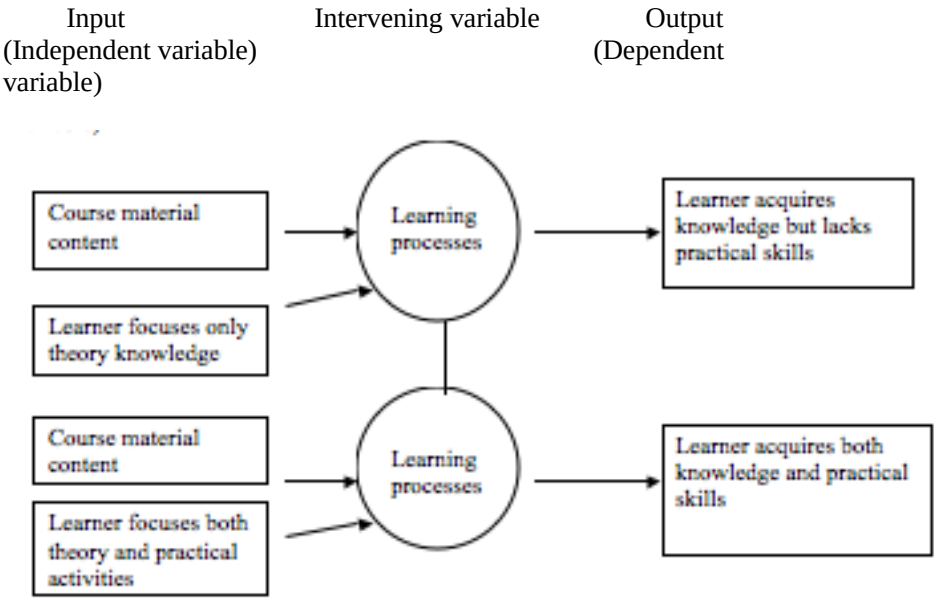

Figure 1: Conceptual model showing the interaction between the various constructs of the study
Source: Author's conceptualization

Purpose of the Study

The overall aim of the study was to ascertain the extent to which NOUN students have attained mastery of practical activities embedded in their course modules. The specific objectives were to:

1. Determine how well students have attained mastery of practical activities embedded in course modules.
2. Find out proportion of students who have yet to acquire practical skills/knowledge embedded in course modules

Research Questions

1. To what extent have students mastered the practical activities embedded in course modules?
2. What proportion of students have yet to acquire practical skills /knowledge prescribed in course modules?

Methodology

Research Design

Descriptive survey research design was adopted to ascertain students' current level of competency in relation to practical skill learning.

Sample and sampling technique

The sample for the study was made up of students, course materials, and subject experts. NOUN operates through a network of 49 study centers spread across the length and breadth of Nigeria. From these, 12 study centres were selected covering six geopolitical zones of the country (i.e. 2 study centres per zone). Student-sample comprised 283 third year students selected from various undergraduate course programmes across five academic Schools. The study adopted multi-stage stratified random sampling procedure in order to have a good representation of the geographical spread. This enabled the researchers to control internal validity in terms of selection factor thereby ensuring representative-ness of the population. The study considered only students in 300 level because they were presumed to have studied first year through third year course materials which formed the scope of this study. The course materials consisted of 43 core courses selected from various programmes from the five academic Schools. Core courses were considered because they were compulsory courses taken by all students in respective programme of study. Stratified random sampling was employed to select the course materials. Likewise, 43 subject experts who were well versed in the selected courses and in ODL system of the rank of lecturer 1 and above formed part of the sample. For the sake of clarity, Table 2 summarizes the sampling composition by geopolitical zone, study center and academic school.

Table 1: Sampling composition by geopolitical zone, study center and school

Geopolitical zone	**No. of study centers per zone**	**No. of respondents per School**					**Total**
		SASS	SE	SL	SMS	SST	
North East	2	7	10	5	10	10	**42**
North West	2	10	10	9	10	10	**49**
North Central	2	10	10	10	10	10	**50**
South East	2	8	10	10	10	10	**48**
South West	2	10	10	9	10	10	**49**
South South	2	5	10	10	10	10	**45**
Total	**12**	**50**	**60**	**53**	**60**	**60**	**283**
No. of course materials		10	10	6	10	7	43
No. of subject experts		10	10	6	10	**7**	43

Key: SASS - School of Arts and Social Studies
SE - School of Education
SL - School of Law
SMS - School of Management Sciences
SST - School of Science and Technology

Instrumentation

Three instruments were developed and used for data collection. These include:

- Practical Performance Checklist (PPC)
- Practical Performance Test (PPT)
- Students' Performance Assessment Measure (SPAM)

PPC contained list of practical skills which students should be competent in. The checklist provided the criterion measure for the study. They were derived after a thorough analysis of 43 sampled copies of course materials. Ideally, the learning objectives in each course module should describe what every student who completes a study unit should be able to do to demonstrate learning. It is these objectives that constituted the checklist. For purpose of this study, only performance-based learning objectives were selected. That is, objectives that require the use of performance assessment. However, the infinite form of the verbs used to frame the learning objectives of the course modules was culled into present continuous tense form. For instance, a statement of objective having "at the end of the unit, students should be able to operate a sewing machine" becomes "operating a sewing machine" as a checklist. From an initial checklists so generated, 50 were selected 10 per School. For reference purposes, the PPC contained the course code and course title in which the learning objectives-turned-checklists were extracted.

Practical Performance Test (PPT) contained list of practical tasks that students were required to perform to demonstrate acquired skills based on the selected 43 courses that formed the scope of the study. In designing the items, the researcher together with subject experts took appropriate steps to convert the generated checklists (PPC) into question format all of which were clearly defined to reflect performance skills demonstration. The test items were distributed programme by programme across five academic Schools. The questions came in different formats - case studies, role-plays, problem scenarios and simulations. Students were requested to attempt two question items. Blank sheets of paper were attached to the instrument for response feedback. The tests were performed simultaneously across selected study centers. Sample items are highlighted in the box below:

"You are to direct a Nollywood play titled, 'The Good Old Days'. Write out a draft showing the summary of the play, the characters, venues, administrative staff, costumes, and budget of the play". (School of Arts and Social Sciences)

"Prepare a comprehensive lesson plan for a specific topic in a senior secondary school class" (School of Education)

"Mr. Bada enters into a supermarket to purchase items. He picked a pair of shoes with a price tag of five thousand naira on it. At the point of payment the shopkeeper told him that the price was actually five thousand US dollars. Mr. Bada is insisting that the shopkeeper is bound to collect five thousand naira from him. Identify the issue and advice the parties". (School of Law)

"Explain the steps you take in preparing Russian lemon tea". (School of Management Sciences)

"State steps you require to perform the experiment to show how Louis Pasteur defeated the theory of spontaneous generation". (School of Science and Technology) (SST)

"Write out the steps for the collection of urine sample for a diabetic patient" (SST)

Student Performance Assessment Measure (SPAM) was designed to assess students' performance on the practical task. It measured the extent to which students had mastered the practical competencies prescribed in

course modules. The subject experts (assessors) carried out the assessment against a set of pre-determined criteria. Students were assessed on the following criteria: accuracy, application, attention to detail, clarity, coverage, logical reasoning, problem solving, and sequence of ideas and self-learning. The criteria cut across all course programmes allowing for more objectivity. All items were placed on a 4-point Likert-type scale of excellent, Good, Fair, and poor with corresponding values of 4,3,2, and 1, respectively.

The instruments (PPT and SPAM) were reviewed for content validity by professionals including the team of 43 subject specialists, two experts in the field of measurement and evaluation as well as one renowned expert in instructional systems design. Their suggestions and recommendations were affected to produce a final draft. The instruments were then pilot-tested on 25 students of equivalent category as participants, to check for internal consistency as well as for clarity and ambiguity. No ambiguity was detected in the instruments. The reliability of PPT was ascertained by test-retest method with one-week interval between first and second administration. The correlation of scores using Pearson product moment correlation analysis gave a measure of the reliability values of 0.78. That of SPAM was ascertained by Cronbach alpha reliability method to test internal consistency with a coefficient value of 0.82 obtained.

Procedure for data collection
The process of data collection involved the following steps:

- Recruitment of 43 subject experts and 12 research assistants and subsequent training on the overall goal of the research, the work plan, logistics, administration and assessment of instruments. Student Counselors in selected study centers served as research assistants and were trained on the administration of instruments while subject experts received training on assessment and scoring processes.
- Preliminary content analysis on selected course materials for identification of performance-based learning objectives (skills)
- Check listing of the skills to be assessed course by course
- Designing appropriate tasks that students will perform to demonstrate the skills, knowledge and attitude acquired
- Specifying the criteria for evaluating students' performances as well as developing a reliable process for assessing performance

The study was conducted between the months of May and June 2012. In each study centre, the practical skills test was administered to students with the help of research assistants under the watch of Study Centre Directors to ensure quality control. Students were made to answer and return both the demographic questionnaire and answer scripts on the spot. Subsequently, subject experts proceeded to assess students' performance against set criteria.

Method of data analysis

Data collected were subjected to appropriate quantitative analyses using basic descriptive statistics such as frequency counts, percentages, mean, and standard deviation. The results obtained from these analyses are presented in the next section.

RESULTS
The research findings are presented in accordance with the two research questions that guided the study.

Extent to which NOUN students have attained mastery of practical activities embedded in their course modules

The responses on the Students' Performance Assessment Measure (SPAM) were analyzed with the use of frequencies and weighted mean scores. The mean scores were computed by multiplying the frequencies of

response with respective scale values (4, 3, 2, 1). The obtained value was then divided by total number of respondents. The cut-off point for judging the significance /non-significance of scores was set at 2.5. This we obtained by adding the scale values and dividing by 4 (i.e. 4+3+ 2+ 1= 10/4=2.5). Hence, any item with a mean rating of 2.5 and above was considered high while any item with a mean rating below 2.5 was regarded low. Result of the analysis is presented in Table 2.

Table 2: Descriptive analysis of NOUN students' mastery of course competencies

Competency	Excellent (%	Good (%)	Fair (%)	Poor (%)	Mean	SD	Student Error
Accuracy	23 (8.1)	139 (49.1)	72 (25.4)	49 (17.3)	2.48	.872	.052
Application	25 (8.8)	130 (45.9)	68 (24.0)	60 (21.2)	2.42	.921	.055
Attention to detail	34 (12.0)	101 (35.7)	91 (32.2)	57 (20.1)	2.40	.941	.056
Clarity	23 (8.1)	128 (45.2)	83 (29.3)	49 (17.3)	2.44	.871	.052
Coverage	24 (8.5)	93 (32.9)	102 (36.0)	64 (22.6)	2.28	.933	.055
Logical Reasoning	25 (8.8)	131 (46.3)	81 (28.6)	46 (16.3)	2.48	.868	.052
Problem Solving	24 (8.5)	106 (37.5)	101 (35.7)	52 (18.4)	2.36	.878	.052
Sequence of Ideas	19 (6.7)	119 (42.0)	98 (34.6)	47 (16.6)	2.39	.841	.050
Self Learning	13 (4.6)	111 (39.2)	99 (35.0)	60 (21.2)	2.27	.846	.050

Table 2 reveals that 23 (8.1 %) of the NOUN students used for the study performed excellently in accuracy, 139 (49.1%) scored good grade, 75 (25.4%) and 49 (17.3%) had fair and poor grades respectively. On application, 25(8.8%) were excellent, 130 (45.9%) were good, 68 (24.0%) were fair while 60 (21.2%) were poor. Thirty-four (12.0%) of the students were excellent in attention to details, 101 (35.7%) were good, 91 (32.2%) were fair as 57 (20.1%) performed poorly. In clarity indicator, 23 (8.1%) of the students performed excellently well, 128 (45.2%) were good, 83(29.3%) performed fairly while 49 (17.3%) were poor. Twenty-four (8.5%) excellently covered the content of their programmes, 93(23.9%) were good in coverage, 102 (36.0%) were fair while 64 (22.6%) were poor. Twenty-five (8.8%) were excellent in logical reasoning, 131 (46.3%) were good, 81 (28.6%) were fair while 46(16.3%) performed poorly. Problem solving of 24 (8.5%) of the students were excellent, 106(37.5%) were good, 101 (35.7%) were fair as 52 (18.4%) were considered poor. Nineteen (6.7%) of the students were excellent in sequences of ideas, 119 (42.0%) were good, 98 (34.6%) were fair while 47 (16.6%) performed poorly. Students' self-learning was considered excellent for 13(14.6%) of the students, good for 111 (39.2%) fair for 99 (35.0%) and poor for 60 (21. 2%). The mean cut-off of competency rating was fixed at 2.50.

From Table 2 therefore it could be deduced that NOUN students generally had low level of competency in practical learning activities as the mean competency values were below the cut-off which is 2.50. However, of the 9 assessment criteria, student demonstrated highest competencies in accuracy and logical reasoning followed by clarity, application and sequence of ideas in that order. The least attained competency was self-learning followed by coverage and problem solving.

Proportion of students who has yet to acquire practical skills/knowledge embedded in course modules

Table 3: Descriptive analysis of student with difficulties acquiring prescribed practical skills

	Frequency	%	Mean	SD	Standard

Competence category					Error
Low	84	29.7	12.55	3.175	.346
High	199	70.3	25.31	3.912	.277

In order to answer research question 2, the students rated competence performance were grouped into two. Since the maximum rated competence score for each student was 36, any student that scored average of 18 and above was considered having high competence while those that scored below 18 were considered having low competence. The students under low competence category were considered to have not acquired competencies prescribed in their course programmes. The mean score for the low competency group was 12.55 (*SD* = 3.175). For the high competency group, the mean score was 25.31 (*SD* = 3.912). Table 3 therefore reveals that 84 (29.7%) of NOUN students sampled appeared not to have mastered the practical skills embedded in their course modules while 199 (70.3%) appeared to have acquired some level of practical skills.

DISCUSSION

The National Open University of Nigeria (NOUN) as a distance education institution implements course programmes using self-instructional printed materials as the primary tool for students' learning. One of the objectives of the undergraduate studies programme is to provide students with the knowledge, skills and attitudes to be able to function in their day-to-day lives. Pepti and Malati (2012) stated it is through study materials that students can learn about the concepts, principles, and procedures, related to cognitive, affective and psychomotor learning abilities.

The result of the study showed that NOUN students generally demonstrated low level of competency in the performance of their tasks. However, students demonstrated highest competencies in accuracy and logical reasoning followed by clarity, application and sequence of ideas in that order. The least attained competency was in self-learning followed by coverage and problem solving in the performance of their tasks. These tasks were the competencies prescribed in their course programmes and extracted from their course materials. The findings of this study show that many students could not attain the required competencies. Perhaps this could be attributed to the emphasis being placed on theoretical knowledge rather than practical knowledge as several authors have indicated that the formal system produces people with facts and theoretical knowledge but limited practical skills. Students should be made to realize that knowledge is being developed and applied in new ways. The global knowledge economy is transforming the demands of the labor market in economies throughout the world. It is also placing new demands on citizens, who need more skills and knowledge to be able to function in their day-to-day lives. Learning entails not only what students know but what they can do with what they know According to Bradley (2012), you won't survive in any career unless you can bring results and to do that you need practical knowledge. It is a fact that every employment opportunity today requires people to use both head and hand skills. If learners focus on theoretical knowledge of their degree courses, this leaves a high percentage of graduates without any form of employability skills to meet the demands of the job market.

Another reason many students could not attain the required competencies could be students' inability to construct knowledge. Constructivism emphasizes the importance of the learner being actively involved in the learning process which should be reflected in the mastery of both theoretical and practical knowledge. Bloom (1956) developed a classification of levels of intellectual behaviour important in learning stating that learning process should be able to reflect the cognitive, affective, and psychomotor aspects of the learners. Good learning according to Pepti and Malati (2012) is learning that is able to hone into these three aspects of human capabilities in right proportion.

CONCLUSION AND FUTURE RESEARCH DIRECTION

The current trend in education has been the move towards practical skill development. In spite of the provision

of course materials to support students' learning, many students failed to demonstrate the desired level of competencies in the performance of their tasks. The world is changing and so is university education as access to learning opportunities has been widened with ODL so it is important that the students get the best out of their courses by actively engaging in learning process and completing all the practical activities they are required to complete. It is then that they will be seen to have successfully passed through ODL programme.

Directions for further studies would include an examination of generic and/or domain specific competencies for the overall programme of study. The current study focused on course-specific competencies. A further study is recommended which should be conducted by means of tracer method, focusing on NOUN graduates in their places of work to assess how they would apply acquired knowledge into practice in real world situation. This is considered necessary as NOUN had produced its first set of bachelor degree graduates.

Limitation of Study

A major limitation of the study was the inability of the researchers to assess respondents on real life conditions. Due to certain constraints, the study adopted what it termed 'alternative to practical' method as a means to simulate real life situations. This involved the actual process of the application of knowledge or sequence of steps whereby students were required to demonstrate competency by showing the steps and processes used to produce a product, service or activity. The assumption was made that a student who could solve the artificial problem could also solve the actual performance problem. More so, studies have shown that where competence cannot be directly observed indirect evidence is used to infer competence. In spite of this limitation, the researchers were of the opinion that the study provides useful insight on the competency level of NOUN students in relation to learning of practical skill.

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