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An Assessment of Practical Skill Learning Activities in Study Materials Developed by the National Open University of Nigeria

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Abstract

Tertiary institutions across the globe are created with the goal to equip learners with both theoretical and practical knowledge to enable them function in their day-to-day lives. Programmes that are built on skills and knowledge are equally the main focus in the National Open University of Nigeria (NOUN). Research suggests that Nigerian educational system tends to prepare students only with theoretical knowledge. How this reflects in open and distance learning (ODL) is not yet known. Since study materials are the vital tools used in instructional delivery, this study assessed the level of practical skill learning elements embedded in the design and development of course materials used by NOUN students. This was with a view to determining whether or not they were tailored to equip learners with practical skills. The descriptive **survey design was adopted for the study. From the** University's archives, 43 copies of printed course materials were randomly selected from variety of courses under various programmes from the five schools to form the sample for the study. The selected course materials were critically examined by 43 subject experts to obtain data on the following: (i)total number of learning objectives in each course module (ii) number of objectives that were stated in measurable behavioural terms presumed to test knowledge (iii) number of objectives that were stated in performance/practical terms presumed to test skills and application of

knowledge. **Data collected were analyzed using frequency counts, percentages, and ratios. Results revealed** that a significant proportion of sampled course materials contained adequate number of learning objectives that were stated in measurable behavioural terms (knowledge level), but found deficient in performance-based objectives (practical skills). From these findings, it was concluded that NOUN should adopt practical skill-based education approach in the design and development of course materials while course modules should contain as much practical knowledge as with theoretical knowledge. Also, all course materials that are deficient in practical skill activities should be reviewed and updated in line with current realities. *In the study the two terms 'practical skills learning' and 'competency-based learning' mean the same and were used interchangeably throughout the study.*

Keywords: Practical knowledge, theoretical knowledge, competency-based course content, study materials, open and distance learning

Introduction

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. 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 NOUN. 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.

There are a growing number of studies asserting the value of practical skills learning. Olakulehin (2009) citing Manjulika and 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 recognised.

The National Open University of Nigeria (NOUN) therefore dedicates itself to preparing professionals in various disciplines through the ODL mode. In the developing world, there is an undeniable dependence on the print for course material delivery. This is the case for NOUN. 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 and their design is of primary importance to the success of distance education programmes. 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 presumably created in a way that ensures learners will acquire the skills and competencies specified in the learning objectives.

From the foregoing reasoning, it is considered important to ascertain the extent to which practical skill learning is being addressed in course materials used by NOUN learners. This is 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. For the purpose of this study, practical learning activity refers to skills performed by hand. These are often reflected in the outcome statement of learning objectives. Theoretical knowledge refers to learning of concepts, principles and information regarding a particular subject. According to Ochiagha (1995) practical knowledge is learning without which mastery of an area of knowledge may be too difficult to achieve.

Importance of Practical Skill Learning in ODL

The importance of practical knowledge in ODL was emphasised by Reckwitz (2002). Dosi, Nelson and Winter (2002), Schatzki, Knorr-Cetina and Von Savigny (2001). One of the characteristics of distance education is the physical separation between teachers and students, hence the use of latest technology to bridge the gap. This condition requires distance education institutions to have learning strategies that can support learning competency in terms of knowledge and practical skills (Pepi and Malati, 2012). The National Open University of Nigeria (NOUN) as a distance education institution implements programmes using self-instructional printed materials as the primary tool for students' learning. As observed by Pepti and Malati (2012). it is through study materials that students can learn about the concepts, principles, and procedures that are related to cognitive, affective and psychomotor learning abilities. Bloom (1956) developed a classification of levels of intellectual behaviour which are important in learning and emphasised 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 proportion.

Research carried out by Lal (1979) shows that practical knowledge can often lead to a deeper understanding of concepts through the act of doing and personal experience. However, Hampton (2002) noted that in the ODL environment the teaching of practical skills poses considerably more difficulties than the teaching of knowledge and theory and pointed out that teaching practical skills requires using very precise instructions to enable the learner to follow the process and repeat the skill. She further stated that the most frequently used method for teaching practical skills is using print-based illustrations of step-by-step procedures. Thus, course modules are required to provide activities and learning strategies that are designed to motivate and engage the learners into performance tasks.

Conceptual Framework

The conceptual framework of the study, which sought to assess the practical skill learning activities in NOUN study materials, shows the symbiotic

relationship between the various constructs of the study and how these impact on learning output. It explains the process of how the quality of course material can shape the learning output and type of products that emerge from such process. Consequently, course content that is purely knowledge-based will produce students that lack practical skills. On the other hand, practice-oriented course content will produce students that are highly skilled to meet the demands of the job market. The conceptual mapping of the interaction between the various constructs of the study is represented in figure 1 below:

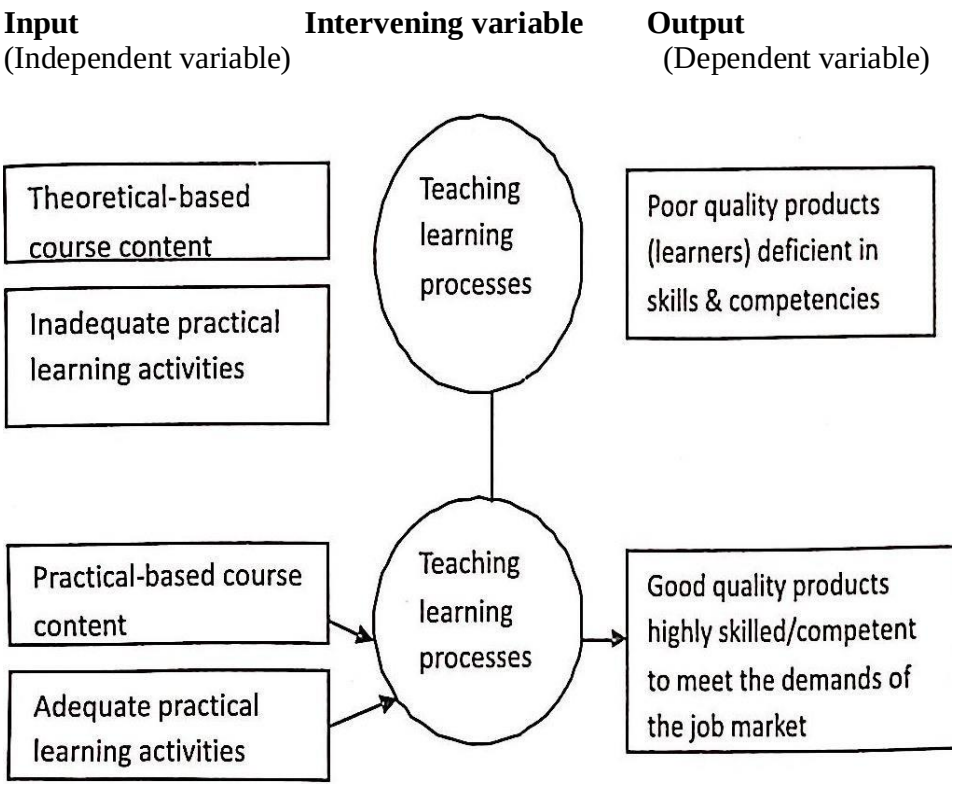

Fig.1: Conceptual Model Showing the Interaction between the various Constructs of the Study
Source: Authors'conceptualisation

Statement of the Problem

This study has been inspired by concern on the general belief of most employers of labour that university graduates in Nigeria lack sufficient practical potentials and capabilities required to contend with the demand of

the labour force (Uwaifo, 2012). According to them less emphasis is placed on practical skills development compared to theoretical knowledge. Essentially, core component of learning competency include knowledge, attitudes, and skills, all these fit into the cognitive, affective and psychomotor domains crucial when designing instruction for distance education, and more importantly during assessment of learning outcome. However, it appears attention is often focused on the cognitive domain. Other aspects, particularly the psychomotor domain considerations, appear less utilized in the design process. In view of the importance attached to skill development in the current dispensation, this phenomenon has serious implications in higher education delivery system more so in distance education programmes where students learn on their own separated from their tutors much of the time. Eight years into NOUN's Existence, there appears to be no research yet carried out to assess the adequacy of practical skill learning elements embedded in course materials. The present study is design to contribute to knowledge while at the same time attempting to fill the identified gap in literature.

Objectives of the study

The main objectives of the study was to assess the level (adequacy) of practical skill learning activities embedded in the design and development of course materials used by students of the National Open University of Nigeria (NOUN). This is with a view to determining whether or not they are tailored to equip learners with practical skills in their various course programmes.

Research question

What is the level of practical skill learning activities embedded in NOUN Course modules?

Methodology

The descriptive survey research design was adopted for the study. The sample for the study was made up of printed course materials as well as subjected expert. The course materials consisted of 43 core courses selected

from various undergraduate programmes from the five existing schools in NOUN. Core Courses were considered because they were compulsory time of this study, NOUN had a total of 1,370 print course materials in the five schools http://www. Nou.edu.ng/Noun/NOUN-OCL/courses material. Likewise, 43 subject specialists who were well versed in the selected courses and in ODL system of the rank of lecturer II and above formed part of the sample. Purposive sampling was applied. The sampling distribution by school, course material and subject expert were follows:

School	**Number of course materials**	**Subject experts**
School of Art and Social Science	10	10
School of Education	10	10
School of Law	0	6
School of Management Sciences	10	10
School of Science and Technology	7	7
Total	**43**	**43**

The main instrument for data collection was the Course Material Analysis Format((CMAF)developed by the researchers to assess **the level of practical learning activities embedded in course modules.** The subject experts (respondents) were requested to critically examine selected course materials (one per respondent) and enter data obtained on the following:(i) total number of learning objectives in each course module; (ii) number of objectives that are stated in measurable behavioral terms presumed to test knowledge (as a guide respondents were asked to check out such words as define, mention, discuss, classify, describe, explain, identify, indicate, outline, etc.: (iii) number of objectives that are stated in measurable behavioral terms presumed to test skills and application of knowledge (as a guide respondents were asked out such as requested to check out such words as construct, compose, create, design, plan, draw, apply, produce, operate,

perform, prepare, use, solve, dramatize, demonstrate, Illustrate, build, assemble. Manipulate, repair, etc.

The face and content validity of CMAF was ascertained through expert judgement involving a team of two experts in measurement and evaluate as well as one renowned expert in instructional systems design. The reliability was ascertained by Cronbach-alpha reliability method to test its internal consistency with a coefficient value of 0.87 obtained.

Data collected were subjected to basic descriptive statistical analysis such as frequency counts, percentages, and ratios.

Results

To answer the research question on the level of practical learning activities embedded in NOUN course modules, the analysis is presented on a school by-school basis. The statements of learning objectives were used as basis for determining the level of practical learning activities embedded in course modules. The cut-on point for judging the adequacy of practical learning in a selected course material is for it to have one-third of the total behavioural objectives stated in performance/practical terms or ratio 1:3. Therefore, any course material having less than one-third or more than ratio 1:3 was considered low in practical skill learning.

School of Aris and Social Sciences

Table 1: Analysis of Course Learning Objectives

S/N	Courses	Total number of learning objectives (a)	Number of objectives stated in measurable terms(test knowledge) (b)	Number of objectives stated in performance terms(test practical skills) (C)	Percent% ratio of (c)to(b)
1	ENG 161	86	83(96.5)	3(3.5)	1:28
2	ENG 212	82	76(92.7)	6(7.3)	1:13
3	INR 142	60	60(100)	-	-
4	INR 231	58	58(100)	-	-

5	PCR 362	84	74(88.1)	10(11.9)	
6	PCR 211	57	57(100)	-	
7	CTH 231	59	59(700)	-	-
8	CT107	67	67(100)	-	
9	CSS 131	38	37(97.4)	1(26	1:37
10	CS5 352	80	71（88.8)	5(11.2)	
		671	642(86.35%)	25(3.65%4)	

Figures in parenthesis denote percentage

Key:

1. ENG 161 Theatre Workshop
2. ENG212 Creative Writing
3. INR 142 Introduction to Public Administration
4. INR 231 South South Cooperation
5. PCR 362 Urban Violence and Security
6. PCR 211 Education for Peace II
7. CTH231 Christian Ethics
8. CTH 107 Old Testament Survey
9. CSS 131 Introduction to Political Science
10. CSS 352 Theory of Crime and Crime Control

Table I reveals that almost all (86.35%) the learning objectives in the ten (10) course materials sampled from the School of Arts and Social Sciences were stated in measurable behavioural terms (knowledge level). However, a negligible percentage (3.65%) was stated in performance/practical terms. Specifically, five of the ten courses' materials had no performance-based objectives. A closer look at the table shows that the number of performance objectives in the course materials ranged from 1 to 10 compared to that of behavioural objectives ranging from 37 to 83. As Table 3 indicates, the ratio values of performance stated objectives compared to behavioural objectives in the course materials ranged from 1:7 to 1:37, which did not meet the cut-off point. It is evident from Table 3 that practical learning elements were inadequate in the sampled course materials.

Table 2: Analysis of Course Learning Objectives

S/N	Courses	Total number of learning objectives	Number of objectives stated in measurable terms (test knowledge) (b) P	Number of objectives stated in performance terms (test practical skills)	Percent % ratio of (c) to (b)
1	BED 111	36	35(97.2)	1 (2.8)	1:35
2	BED 211	37	34 (91.9)	3 (8.1)	1.11
3	EDU 323	103	84 (81.6)	19 (18.4)	1:4
4	EDU 110	32	23(71.9)	-	-
5	EDU 212	49	40 (81.6)	-	-
6	EDU 321	41	41(100)		
7	EDU 332	59	26(44.1)	30 (50.8)	1:1*
8	EDU 233	75	46 (61.3)	4 (5:3)	1:11
9	EDU 114	57	54 (94.7)	17 (29.8)	1:3*
10	EDU 214	69	68 (98.6)	1 (1.4)	1:68
		558	451(82.3%)	75 (11.6)	

Figures in parenthesis denote percentages.
***Significant**

Key:

1. BED 111 Introduction to Keyboard and Word Processing
2. BED211 Microsoft Office
3. EDU323 Basic Research Methods in Education
4. EDU110 Professionalism in Teaching
5. EDU212 Sociology of Education
6. EDU321 Psychology of Learning
7. EDU332 Introduction to Educational Technology
8. EDU233 General Teaching Methods
9. EDU 114History of Education
10. EDU214 Philosophy of Education

The 10 courses analysed in the School of Education are compulsory courses for the 12 undergraduate programmes run by the school. Table 2 reveals that most (82.3%) of the stated learning objectives in all the course materials analysed were stated in behavioural terms (knowledge level), very few (11.6%) were stated in performance/practical terms. Specifically, three of the

ten courses materials had no performance-based objectives. A closer look at the table shows the number of performance objectives in the course materials ranged from l to 30 compared to that of behavioural objectives ranging from 23 to S4. As Table 5 indicates, the ratio values of performance stated objectives compared to behavioural objectives in the course materials ranged from 1:1 to 1:68. Except fortwo courses, all other courses in the school have performance objectives that did not meet the cut-off point. It was also observed from Table 5 that figures in columns 3 and 4 when summed up could not give the figure in column 2 - an indication that some learning objectives were worded in form that cannot be measured. Also, from the table, EDU 332 has more of its objectives stated in practical terms. It is evident from Table 2 that competency-based learning elements in the course materials were inadequate for nine of the sampled courses.

School flaw

Table 3: Analysis of Course Learning Objectives

S/N	Courses	Total number of learning objectives (a)	Number of objectives stated in measurable terms(test knowledge) (b)	Number of objectives stated in performance terms (test practical skills) (c)	Percent% ratio of (c)to(b)
1.	LAH'233	30	22(73.3)	8(26.7)	1:3*
2.	LAI 244	29	27(93.1)	2(6.9)	1:13
3.	LAW343	50	44(SS)	6(12)	1:7
4.	LAW324	50	40)(9S)	1(2)	1:49
5.	LAW341	S5	05(76.5)	20(23.5)	1:3*
6.	LAW234	17	15(SS.2)	2(11.S)	1:7
		265	222(86.1)	39(13.8)	

Figures in parenthesis denote percentages
***Significant**

Key:

1. LAW233 Law of contract
2. LAW 244 Constitutional Law II
3. LAW323 Law of Tort l
4. LAW 324 Law of Tort ll

5. LAW 341 Criminal LawI
6. LAW 234 Law of Contract II

Six (6) course materials were analysed from the School of Law. The results of the analysis of data in Table 3 reveal that overall 86.1% of the stated learning objectives were stated in behavioural terms (knowledge level) while 13.8%were stated in performance/practical terms. Specifically, two of the courses have adequate number of learning objectives that are stated in performance terms as they met the cut-off point of ratio 1:3 or one-third of behavioural objectives. It is evident from Table 3 that competency-based learning elements were found deficient in four of the courses sampled.

School of Management Sciences

Table 4: Analysis of Course Learning Objectives

S/N	Courses	Total number of learning objectives (a)	Number of objectives stated in measurable terms(test knowledge) (b)	Number of objectives stated in performance terms (test practical skills) (c)	Percent% ratio of (c)to(b)
1.	COP 101	55	30(54.5)	25(45.5)	1:2*
2.	COP 311	53	33(62.3)	20(37.7)	1:2*
3.	ENT 323	28	26(92.9)	2(7.1)	1:13
4.	ENT 321	62	42(67.7)	20(32.3)	1:2*
5.	HCM 313	33	27(81.8)	6(18.2)	1:4
6.	HCM 238	49	36(73.5)	13(26.5)	1: 2*
7.	TSM 142	31	27(87.1)	4(12.9)	1:6
8.	TSM 241	16	4(25)	12(75)	3: 1 **
9.	TSM 347	30	19(63.3)	21(36.7)	1:1
10.	HCM 333	26	26(100)	-	1:26
		383	270(70.8)	123(29.2)	

Figures in parenthesis denote percentages.
***Significant**
*** * highly significant**

Key:
1. COP101 Introduction to Cooperatives

2. COP 311 Principles and Practice of Cooperatives
3. ENT323Entrepreneurial Development and Small Business Management
4. ENT 321 Quantitative Methods for Business Decisions
5. HCM 313 Restaurant Entrepreneurship
6. HCM238 Food and Beverage Production II
7. TSM 142 Tourism in Industry
8. TSM241 Understanding Tourist and Hosts
9. TSM 347 Commercial Recreation Management
10. HCM333 Food and Beverage Services III

As presented in Table 4, ten (10) course materials were sampled from the School of Management Sciences. The analysis presented in the table reveals that five of the courses met the cut-off point as they have adequate number of learning objectives stated in performance terms. As observed in Table 9, TSM 241 had more of its objectives stated in performance/practical terms. Overall, 70.8% of the total learning objectives were stated in behavioural terms (knowledge level) while 29.25% were stated in performance/practical terms. This implies that less than one-third of behavioural learning objectives were stated in performance terms. It is evident from Table 4 that competency-based learning elements were inadequate in the sampled course materials.

School of Science and Technology

Table5: Analysis of Course Learning Objectives

S/N	Courses	Total number of learning objectives (a)	Number of objectives stated in measurable terms(test knowledge)(b)	Number of objectives stated in performance terms (test practical skills) (c)	Percent% ratio of (c)to(b)
1.	BIO 217	64	52(81.3)	12(18.7)	1:4
2.	CHM 204	65	55(84.6)	10(15.4)	1:5
3.	BIO 201	67	58(86.6)	2(3.0)	1:29
4.	NSS 322	18	18(100)	-	1:100
5.	NSS 201	83	79(95.2)	4(4.8)	1:19
6.	CIT 215	59	40(67.8)	19(32.2)	1:2*
7.	PHY 191	27	15(55.6)	12(44.4)	1:2*
		383	317(81.5)	59(16.9)	

Figures in parenthesis denote percentages
***Significant**

Key:

1. BIO 217 Introduction to Microbiology
2. CHM207 Structure and Bonding
3. BIO201 Genetics
4. NSS 322 Medical Surgical Nursing
5. NSS 201 Foundation of Nursing
6. CIT 215 Introduction to Programming
7. PHY 191 Introduction to Practical Physics 1

As presented in Table 5, seven (7) course materials were analysed from the School of Science and Technology. The analysis presented in Table 5 reveals that 81.5% of the stated learning objectives in all the sampled course materials were stated in behavioral terms (knowledge level), 16.9% were stated in performance/practical terms. Specifically, CIT 215 and PHY 191have number of performance objectives that met the cut-off point. It is evident that practical learning elements in the course materials were inadequate for five of the sampled courses.

Discussion

The analysis of result from the study indicates that although considerable percentage of the sampled course materials had sufficient number of learning objectives that were stated in measurable terms, many of those course materials did not present adequate number of performance-based objectives. This means that the statement of learning objectives in NOUN course materials concentrated on knowledge level. Consequently, competencies, which are descriptions of student's ability to apply basic and other skills in situations that are commonly encountered in everyday life is lacking. This means that the course materials are not geared towards the set of outcomes that are derived from an analysis of distinctive tasks expected of learners in real life situations. The resultant effect therefore is producing learners who are only grounded in the theoretical aspect of these course modules but not in practical terms. It is a fact that every employment opportunity today requires people to use both head and hand skills. If learners are only exposed to 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. According to Obanya (2007), such education is part of integral development of the 'three Hs' - the head, the heart, and the hands which must not be neglected, as doing that will amount to a denial of an individual's integrated personality development. Therefore, the course modules should be designed to equip learners with skills that will make them self-reliant and also prepare them to enter into jobs and progress in them. 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 ensuring that the course materials adhere to the tenets of quality assurance through the production of competency-based learning for the benefit of the learners and the world of work. The global knowledge economy is transforming the demands of the labour 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. Equipping people to deal with these demands requires a new model of education and training. Countries need to respond to these needs by creating education and training systems that equip people with the appropriate skills.

Conclusion

In ODL, course materials are at the centre of learning. Therefore, their design is of primary importance to the success of distance education programmes. As such, practical activities must be implemented for courses, it is important for NOUN to imbue practical learning elements in the design and development of course materials to ensure that they are tailored to equip students with practical skills in order to meet the demands of the 21st century knowledge society. Theory and practical experience are just complementary means to that end.

Recommendations

The following recommendations are made towards improving the quality of NOUN course materials to reflect competency-based learning

that would translate to learning efficiency and skill acquisition on the **part of students:**

1. NOUN should adopt competency-based education approach in the design and development of course materials. Course materials should contain as much practical knowledge as with theoretical knowledge because theory and practical experience are just complementary means to that end
2. There is a need for proper training of course material developers in order to orient them and instill the necessity of embedding competency-based elements in the materials and to ensure emphasis on performance-based objectives to be able to deliver the educational services which students need and desire. Without training, the writer cannot adequately develop instructional course materials for distance education. The training should be carried out through workshops. To achieve optimum result, the training should involve course team approach whereby course writers rather than write in isolation will have to work together with editors, graphic artists, and instructional designers to produce performance-based course materials. Evidence attests to the fact that development of the best quality of instructional text requires input from a number of contributors.
3. All course materials that fall short of expectation in terms of deficiency in performance-based objectives should be reviewed and updated in line with current realities.

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