

Original Research Article

Competency improvement needs of lecturers in colleges of agriculture in developing psycho-productive multiple choice test items in crop science in North Central Zone, Nigeria

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Abstract

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The study was carried out to determine the Competency Improvement Needs of Lecturers in Colleges of Agriculture in developing Psycho-productive Multiple Choice Test Items in North Central Zone, Nigeria. One research question guided the study. The Experimentation research design was adopted. The population was 38 lecturers of Colleges of Agriculture in North Central Zone, Nigeria. A 30 multiple choice test items using Simpson's taxonomy of the Psycho-motor domain was used for data collection. Kuder-Richardson (K-R20) was used to determine the internal consistency of the instrument which yielded a coefficient of 0.88. The data were analyzed using Mean and Quality Assurance Gap (QAG) index to determine the competency needs of the Lecturers. It was found out that Lecturers in Colleges of Agriculture lack competencies in developing Psycho-productive multiple choice items for measuring students' performance in activity-based components of the crop science curriculum. Based on the findings of the study, it was recommended that Lecturers be retrained through workshops and seminars.

Keywords: Competency, Crop science, Curriculum, Improvement, Nigeria, Psycho-productive

INTRODUCTION

One of the major duties of the teacher in any instructional setting is to determine the extent to which the objectives of the curriculum is been achieved. In order to do this, he needs to measure the learners' degree of performance. In the context of this study, measurement is viewed as the extent to which all the activity-based components of crop science curriculum in colleges of Agriculture in North Central Zone of Nigeria could be achieved using valid measuring instruments. The three major educational domains are contained in any institutional curricula objectives (cognitive, affective and the psycho-motor). The Bloom's taxonomy approach has always been utilized in the measurement of the cognitive and affective components. The taxonomy has the following levels

(knowledge, comprehension, Application, Analysis, Synthesis and Evaluation). The psycho-motor objectives of the curriculum cannot be measured with Bloom because the taxonomy emphasized the measurement of product, while in activity-based curriculum, emphasis is placed on the measurement of process. It is the realization of the shortcomings of using Bloom taxonomy to measure the activity-based component of any instructional objectives that Simpson (1972) developed psycho-motor domain taxonomy with the following levels-perception, set, guided response, mechanism, complex overt response, adaptation and origination. The researcher's analysis of the measurement instruments used in these colleges of Education revealed that the

lecturers dwelt mostly on the measurement of product (Bloom's) instead of the measurement of process (Simpson's). These points to the fact that the lecturers lack the competencies required to develop psycho-productive multiple choice test items using Simpson's taxonomy. This in effect made the achievement of the activity-based components of the crop science curriculum of Colleges of Agriculture in North Central Zone, Nigeria very elusive. To be able to develop an instrument to measure the psycho-motor objectives require some competencies on the part of the lecturers. Competence in the submission of Encarta (2014) is the ability to do something well, measured against a standard, especially ability acquired through training or experience. Also International Labour Organization report (2003) posited competency as the knowledge, capabilities and behaviour which someone exhibits in doing his job and which are factors in achieving the objectives pertinent to the teaching strategies. Competence in the context of this study is the acquisition of knowledge, skills and attitudes which the lecturers in Colleges of Agriculture require to develop psycho-productive (activity-based) test items to achieve activity-based objectives of the crop science curriculum. The level of competence or excellence in performance is measured by establishing acceptable criteria and standards. Where the lecturers lack the ability to develop the measurement criteria and standards has a great consequence. The implication of these practices in the view of Olaitan and Mama (2001) is that students graduate from the programme without acquiring the basic competencies that will enable them to fix themselves into the world of work.

Problem statement

The success of Educational institution is the achievement of its set goals of changing the behaviour of learners. The major goal of colleges of Agriculture among others is to provide middle level manpower in the area of animal and crop production. The researchers' observation revealed that the measurement instruments used in these Colleges to assess the Psycho-motor domain objectives of their curriculum are Bloom based. This is because the lecturers are more conversant with the use of Bloom's taxonomy whose measurement is product oriented while measurement of Psycho-motor objectives ought to be process oriented which is the emphasis of Simpson. It is the realization of this emphasis that the researcher carried out this study to ascertain the competency improvement needs of lecturers in developing valid measuring instrument to assess the achievement of activity-based objectives of the Colleges of Agriculture crop science curriculum in North Central Zone of Nigeria.

The purpose of this study therefore is to identify areas where Lecturers in Colleges of Agriculture require

competences in developing psycho-productive test items that will be quality assuring in measuring students performance in activity-based components of the crop science curriculum.

Research Questions

The research question that guided the study is; What are the competency improvement needs of lecturers in developing psycho-productive multiple choice items in the seven levels of Simpson's Psycho-motor domain viz: (perception, set, guided response, mechanism, complex overt response, adaptation and origination) to measure the students' performance in activity-based crop science curriculum of colleges of Agriculture?

METHODOLOGY

One research question guided this study. Survey research design was adopted for this study. (Olaitan et al., 2000) stated that survey research design is the plan, structure and strategy that the investigator wants to adopt in order to obtain solution to reach problems using questionnaire in collecting, analyzing and interpreting the data. A 36 item multiple choice questions whose item difficulty indices ranged between 0.31 and 0.68 and discrimination indices ranged between 0.20 and 0.64 was utilized to collect data from the Lecturers in the two Colleges of Education.

The study was carried out in Cross River State with a population of 47 lecturers comprising of all the 19 lecturers in Akamkpa and 28 in Obudu in the Department of Vocational and Technical Education of the two Colleges of Education in the state. The population was small and therefore the entire population constituted the sample for the study.

A 36 item multiple choice questions were developed by the researchers using the Simpson Psycho-motor Domain Taxonomy with the seven levels of Perception (5 questions) Set (5 questions) Guided response (6 questions) Mechanism (6 questions) Complex over response (6 questions) Adaption (4 questions) and Origination (4 questions). The instrument was validated by three experts in the Department of Vocational Teacher Education, University of Nigeria, Nsukka. Kuder-Richardson (K-R20) was used to determine the internal consistence of the instrument with a coefficient of 0.91. The items were thoroughly mixed together and the 47 lecturers were asked to separate the items into the correct levels in the Simpson taxonomy. At the end of the exercise, the lecturers were graded. Where the Observed Mean score of the respondents is equal or higher than the Expected Mean on an item implies that no quality assurance required but where the Observed

Table 1. Quality assurance Gap analysis of responses of lecturers in developing psycho-productive multiple choice items in Perception level of Simpson's Psycho-motor taxonomy

Item Number	Number that Identified Item Correctly	Expected Mean	Observed Mean	Remarks
1	11	0.5	0.23	QAN
2	15	0.5	0.32	"
3	18	0.5	0.38	"
4	12	0.5	0.26	"
5	14	0.5	0.30	"

QAN= Quality Assurance Needed
N=47

Table 2. Quality assurance Gap analysis of responses of lecturers in developing psycho-productive multiple choice items in Set level of Simpson's Psycho-motor taxonomy

Item Number	Number that Identified Item Correctly	Expected Mean	Observed Mean	Remarks
1	21	0.5	0.45	QAN
2	17	0.5	0.36	"
3	22	0.5	0.47	"
4	11	0.5	0.23	"
5	14	0.5	0.30	"

QAN= Quality Assurance Needed
N=47

Mean is lower than the Expected Mean implies that quality assurance is required. In this study, the Expected Mean score is 0.5 (0 + 1 /2)

RESULT

The result of the study was obtained from the research questions answered.

Research question 1

What are the competencies required by lecturers in developing psycho-productive multiple choice items in the Perception level of Simpson's Psycho-motor domain?

The data for answering this research question were presented in table 1. The data in table 1 revealed that the means score of the lecturers in the five (5) items at the Perception levels of the domain ranged between 0.23 and 0.38 and were less than 0.5. Therefore they require competence in developing psycho-productive multiple choice items in the Perception level of the domain for measuring students' performance in activity-based components of the Colleges of Education curricula.

Research question 2

What are the competencies required by lecturers in developing psycho-productive multiple choice items in the Set level of Simpson's Psycho-motor domain?

The data for answering this research question were presented in table 2. The data in table 2 revealed that the means score of the lecturers in the five (5) items at the Perception levels of the domain ranged between 0.23 and 0.47 and were less than 0.5. Therefore they require competence in developing psycho-productive multiple choice items in the Set level of the domain for measuring students' performance in activity-based components of the Colleges of Education curricula.

Research question 3

What are the competencies required by lecturers in developing psycho-productive multiple choice items in the Guided Response level of Simpson's Psycho-motor domain?

The data for answering this research question were presented in table 3. The data in table 3 revealed that the means score of the lecturers in the six (6) items at the Perception levels of the domain ranged between 0.26 and 0.45 and were less than 0.5. Therefore they require

Table 3. Quality assurance Gap analysis of responses of lecturers in developing psycho-productive multiple choice items in Guided response level of Simpson's Psycho-motor taxonomy

Item Number	Number that Identified Item Correctly	Expected Mean	Observed Mean	Remarks
1	12	0.5	0.26	QAN
2	20	0.5	0.43	"
3	15	0.5	0.32	"
4	17	0.5	0.36	"
5	21	0.5	0.45	"
6	19	0.5	0.40	"

QAN= Quality Assurance Needed
N=47

Table 4. Quality assurance Gap analysis of responses of lecturers in developing psycho-productive multiple choice items in Mechanism level of Simpson's Psycho-motor taxonomy

Item Number	Number that Identified Item Correctly	Expected Mean	Observed Mean	Remarks
1	21	0.5	0.45	QAN
2	17	0.5	0.36	"
3	22	0.5	0.47	"
4	11	0.5	0.23	"
5	14	0.5	0.30	"
6	16	0.5	0.34	"

QAN= Quality Assurance Needed
N=47

Table 5. Quality assurance Gap analysis of responses of lecturers in developing psycho-productive multiple choice items in Complex overt response level of Simpson's Psycho-motor taxonomy

Item Number	Number that Identified Item Correctly	Expected Mean	Observed Mean	Remarks
1	12	0.5	0.26	QAN
2	18	0.5	0.38	"
3	11	0.5	0.23	"
4	14	0.5	0.30	"
5	13	0.5	0.28	"
6	17	0.5	0.36	"

QAN= Quality Assurance Needed
N=47

competence in developing psycho-productive multiple choice items in the Guided response level of the domain for measuring students' performance in activity-based components of the Colleges of Education curricula.

Research question 4

What are the competencies required by lecturers in deve-

loping psycho-productive multiple choice items in the Mechanism level of Simpson's Psycho-motor domain?

The data for answering this research question were presented in table 4. The data in table 4 revealed that the means score of the lecturers in the six (6) items at the Perception levels of the domain ranged between 0.23 and 0.47 and were less than 0.5. Therefore they require competence in developing psycho-productive multiple choice items in the Set level of the domain for measuring

Table 6. Quality assurance Gap analysis of responses of lecturers in developing psycho-productive multiple choice items in Adaptation level of Simpson's Psycho-motor taxonomy

Item Number	Number that Identified Item Correctly	Expected Mean	Observed Mean	Remarks
1	22	0.5	0.47	QAN
2	18	0.5	0.38	"
3	21	0.5	0.45	"
4	17	0.5	0.36	"

QAN= Quality Assurance Needed
N=47

Table 7. Quality assurance Gap analysis of responses of lecturers in developing psycho-productive multiple choice items in Origination level of Simpson's Psycho-motor taxonomy

Item Number	Number that Identified Item Correctly	Expected Mean	Observed Mean	Remarks
1	12	0.5	0.26	QAN
2	14	0.5	0.30	"
3	13	0.5	0.28	"
4	16	0.5	0.34	"

QAN= Quality Assurance Needed
N=47

students' performance in activity-based components of the Colleges of Education curricula.

Research question 5

What are the competencies required by lecturers in developing psycho-productive multiple choice items in the Complex Overt Response level of Simpson's Psycho-motor domain?

The data for answering this research question were presented in table 5. The data in table 5 revealed that the means score of the lecturers in the six (6) items at the Perception levels of the domain ranged between 0.23 and 0.38 and were less than 0.5. Therefore they require competence in developing psycho-productive multiple choice items in the Complex overt response level of the domain for measuring students' performance in activity-based components of the Colleges of Education curricula.

Research question

What are the competencies required by lecturers in developing psycho-productive multiple choice items in the Adaptation level of Simpson's Psycho-motor domain?

The data for answering this research question were presented in table 6. The data in table 6 revealed that the means score of the lecturers in the four (4) items at the

Perception levels of the domain ranged between 0.36 and 0.47 and were less than 0.5. Therefore they require competence in developing psycho-productive multiple choice items in the Adaptation level of the domain for measuring students' performance in activity-based components of the Colleges of Education curricula.

Research question 7

What are the competencies required by lecturers in developing psycho-productive multiple choice items in the Origination level of Simpson's Psycho-motor domain?

The data for answering this research question were presented in table 7. The data in table 7 revealed that the means score of the lecturers in the four (4) items at the Perception levels of the domain ranged between 0.26 and 0.34 and were less than 0.5. Therefore they require competence in developing psycho-productive multiple choice items in the Origination level of the domain for measuring students' performance in activity-based components of the Colleges of Education curricula.

DISCUSSION OF RESULT

The result of this study on Quality- Assurance Ability of Lecturers in developing psycho-productive multiple choice items in Colleges of Education in Cross River State is in conformity with the statement in the National

Policy on Education (FGN 2004), that all teachers in educational institutions shall be professionally trained and that Teacher Education Programmes shall be structured to equip teachers for effective performance of their duties. The result of the study is in consonance with Aguolu (2004) in his study on competency - improvement needs of supervisors of teachers of agriculture in primary and post primary schools in federal capital territory, Abuja where the researcher found out that supervisors of teachers of agriculture needed improvement in 8 modules with their 97 corresponding supervisors competencies in which supervisors of teachers of agriculture required improvement. The findings of this study also agreed with Sowande (2002), in a study on technical competency improvement needs of metal work teachers in Nigeria Colleges of Education. The author found out that metal work teachers needed improvement in 80 (eighty) competency items for better performance on the field.

The above finding is in agreement with the opinion of Olaitan (2004) who stated that the teachers of Agricultural Education are expected to be technicians in Agriculture dealing effectively with the cognitive, psycho-motor and affective outcomes and, therefore, they are expected to be knowledgeable, skillful and competent in Agricultural Education. This study is also in conformity with Ukonze and Olaitan (2009) in a study on capacity building need of teachers for effective teaching of agriculture science in Anambra state. It was found out in the above study that teachers in Anambra state needed capacity building for effective teaching of agriculture in the areas of planning instruction, implementing instruction, evaluating instruction and helping students manage practical in the farm for their professional growth.

CONCLUSION

From the result of this study it was discovered by the researchers that lecturers in Colleges of Education in Cross River State needed capacity building for effective development of psycho-productive skill test items to measure the performance of students to determine the achievement of the psycho-motor objectives of the curricula. If the findings of this study is developed into a competency building programmes for lecturers, it will help them to overcome some inadequacies as outlined in the introduction of this study.

RECOMMENDATION

The recommendation arising from this study is that identified competencies where lecturers of Colleges of Education need capacity building for effective development of psycho-productive skill multiple choice test items for measuring the achievement of psycho-motor objectives of Colleges of Education curricula in Cross River State be packaged into a training programme to be utilized in retraining the lecturers through workshops and seminars.

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