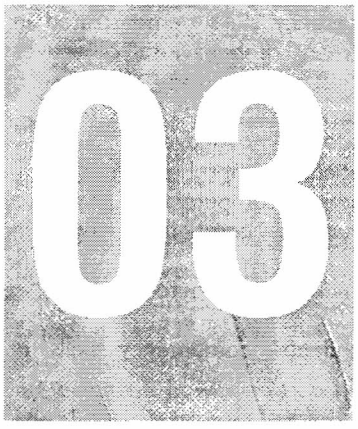

Analysis of Questioning Pattern and Validity of Secondary School Geography Teachers in Mangu Local Government Area of Plateau State

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ABSTRACT

The purpose of the paper was to analyse the evaluation questions of geography teachers as contained in their lesson plans, in terms of how well they cover the objectives of the lesson and the types and forms of the question with respect to Blooms (1964) and Franenkel (1973) classifications. The simple random sampling was employed to select the lesson plans of twenty-one geography teachers of the study area from a sample frame of thirty-eight teachers, which served as the sole instrument used for data collection for the study. The statistical techniques of proportion, chi-square and Pearson product moment correlation coefficient were used for the analysis of the data. The result of the analysis revealed that while a large number of the teachers asked appropriate and adequate questions, majority of them could not ask diverse questions. Moreso, those who asked appropriate questions, such questions were not necessarily adequate. Thus, no significant relationship existed between the appropriateness and adequacy of the evaluation questions of the teachers. Most of them were able to ask both low and high level questions with a slight difference between qualification groups. Appropriate recommendations were therefore made based on these findings.

Background of the Study:

Effective teachers, who are determined to accomplish quality instruction in their classrooms, are in constant state of planning. Of all the instructional planning stages, the lesson plan is the pivotal aspect of the entire process (Callaham & Clerk, 1997). The lesson plan provide evidence of the teacher's preparation in terms of materials, methodology and activities to be carried out in a particular lesson.

The validity of the lesson plan as an instrument for effective teaching is measured by the balance that is achieved between its component parts. Thus, there is the need for balance between the content and objective, objective and methodology, content and evaluation and objective and evaluation. These are basic ingredients that are crucial to quality instruction. The instructional objective is a statement of what students are expected to know at the end of some periods of instruction. Typically, an instructional objective as described by Ekoja and Ejoja (2006) is a statement of effect that results from a planned instruction, which also clarifies how the objective will be measured as a basis for evaluating learning outcome. This suggests that there is a strong relationship between evaluation and the objective of a lesson. By implication therefore, an effective teacher, who is an advocate and practitioner of quality classroom instruction does not take evaluation for granted.

The purpose of evaluation, according to Ekoja and Ekoja (2006) is two fold: first is to help the teacher determine the degree to which educational objectives have been achieved and secondly to help the teacher know his students. The second is considered subsidiary to the first. The task of the classroom teacher therefore is to assist his students in reaching these objectives

which guide every step of the teaching process. The teachers' professional roles thus have meaning in so far as they are oriented towards the educational objectives (Ekoja & Ekoja, 2006).

The basic characteristics of evaluation as maintained by Okam (2002) is goal oriented. Thus, the need to clarify and determine what is to be evaluated, always has priority in the evaluation process. He stresses that evaluation is so intrinsic to the teaching – learning system in that there is vital need for its systematic planning because it can be channeled into helping the teacher understand the learners, plan learning experiences for them and determine the extent to which instructional objectives are being achieved. Okam (2002) maintained that it is only when data from evaluation is derived from information that is accurate, relevant and comprehensive that instructional decisions and judgements are made in a sound manner. The function of evaluation, he pointed out, includes guidance towards achievement of instructional objectives, determining students readiness for new learning experience, diagnosing their learning difficulties, placing them in a classroom groups for special activities and assisting them in their problem of adjustment.

The geography teacher, like every other teachers usually evaluates his lessons through the use of performance assessment which consists of series of questions that seek to find out the extent to which the testees have learnt the content of learning experience vis-à-vis the set objectives. The questions are therefore, substantially valid on the basis of the degree or extent to which they are addressed to probing the objectives of the lesson. Thus, the objective – reference thrust of evaluation questions define their validity index. This means that the standard for any evaluation is the predetermined objectives which constituted the target of the questions. This also implies that the criteria for the evaluation is the performance of the students which is the result of their responses to the questions. If the students answer most or all of the questions correctly it is taken that the lesson has been successful. If on the other hand the students fail to answer most or all of the questions correctly, it is taken that the lesson has not been successful. Another aspect of evaluation questions is the kind of knowledge they probe from learners. This defines the level of abstraction of the questions as categorized by Bloom (1964) cited in Chollom (2005). Bloom fashioned the following categories of competency skills demonstrated in testing the achievement of behavioral objectives that commonly occurs in educational setting such as:

- Testing students' knowledge
- Testing students' comprehension
- Testing students' competency in analysis
- Testing students' competency skills in synthesis
- Testing students' competency skills in application
- Testing students' competency skills in evaluation.

Callahan and Clark (1977) classified questions into convergent, cognitive memory, evaluative and divergent questions, covergent questions are narrow questions which require quite a lot of thinking but, once though out, there is only one correct answer. Thus, such questions require one to come out with a specific correct answer even though he may have to do some thinking. Divergent questions are wide open questions that no one can predict exactly what the answer will, or should be. Divergent questions do not have one correct answer, as such the open students up and set them into thinking and imagination. Divergent questions, because of their broadening effects, are also referred to as open – ended or productive questions. Cognitive memory questions are those that test one's memory, which is similar to bloom's test of knowledge. They are narrow rather than broad and require little or no thinking. Evaluative questions are a special case of divergent questions that ask students to put value on something, which are very subjective.

Franenkel (1973) suggested a classification of questions in terms of the purposes which teachers might have, the response or actions requires of students and the types (of questions), which he would accordingly ask. This classification is rendered thus:

- Recall questions
- Descriptive questions
- Explanatory questions
- Synthesizing questions
- Judgmental questions

- Open ended questions

As noted by Oguniyi (1986), there are generally more than one questioning technique. Notwithstanding, he says the questions should reflect the objective of the lesson. While some researchers, for instance Mahlios and Angelo (1983) have reported that higher cognitive level questions elicit higher-level cognitive response and better achievement of students. Others, for instance, Smith (1985), Gall (1970) and Swift and Gooding (1983) found that the higher cognitive level questions had no effect on students' achievement. Lower cognitive level questions seek specific recall answers, while higher cognitive level questions set the students into thinking.

The thrust of this study is to analyse the evaluation questions of geography teachers in the study area, in terms of how well they cover the objectives as were stated in their lesson plans. More so, the study seeks to analyse the types and forms of questions that are asked by the teachers in terms of their cognitive involvement of the students, especially as described by Bloom (1964), Callahan and Clerk (1977), and Franenkel (1973), and to offer useful suggestions based on its findings for better instructions of geography in our secondary schools.

Problem of the Study

Classroom instruction in geography requires that the teacher makes sound evaluation of his effort. This is contingent on the fact that the teacher, as he carries out his instructional activities, is faced with vital decisions relating to what material to use, methods of teaching that are appropriate, and what activities on the part of the students are likely to help them attain the desired objectives. Evaluation is thus they critical to the teachers decision on these important variables which are basic to the teaching-learning process. If the geography teacher must be well positioned to provide the right leadership for his class that would afford him the opportunity to pilot them to the attainment of the educational objective, he must be seen to be employing effective evaluation techniques and procedures.

This may not be the case with all teachers and most likely constitute a source of obstruction to effective teaching and the attainment of educational goal. For instance, Joel (2002) investigated constraints to students' effective learning of map reading in Adamawa and found that teachers' method of teaching and evaluation was a key factor. This is most likely related to the questioning style of the teachers. Personal experience of the researcher during his teaching practice supervision of undergraduate students of the University of Jos in February 2007 is quite revealing. It was discovered that strong discrepancies existed between evaluation questions and the objectives stated in their lesson plans. The fundamental question involves the pattern and types of questions geography teachers in our secondary schools used in evaluating their lessons. The appropriateness (validity), adequacy and diversity of the questions form the central focus of this study. Whether or not their questions meet common norms with regards to stated objectives and domains of learning experiences formed the guiding framework for the analysis.

Purpose of the Study

The purpose of the study was to analyse the pattern and types of questions that geography teachers in the study area ask to evaluate their lessons as embodied in their lesson plans. This is to be accomplished through the following specific objectives:

1. To determine the appropriateness of the evaluation questions
2. To determine the adequacy of the questions.
3. To determine the diversity of the questions.
4. To determine the type and form of the questions
5. To find out the relationship between qualification of teachers and the types, appropriateness, adequacy and diversity of the questions they asked.

Research Questions

The basic research questions that guided the study include the followings:

1. Do geography teachers ask appropriate (valid), adequate and diverse evaluation questions in their lesson?
2. What are the types of questions asked by the geography teachers in evaluating their lessons?
3. Do teachers differ in the types of questions they asked with qualification?

Hypotheses of the Study:

HO_1: The appropriateness and adequacy of questions asked by geography teachers is independent of their qualification

HO_2: There is no significant relationship between the adequacy and appropriateness of evaluation questions of geography teachers in the study area.

HO_3: The cognitive exploit of evaluation questions of geography teachers is independent of their qualification.

Theoretical Basis:

The criterion – reference or objective – based test propounded by Glasser (1963) cited in Popham (1990) and Bloom (1964) taxonomy for categorizing levels of abstraction of questions formed the theoretical basis of the study. The criterion – referenced test references an examinees performance to defined set of criterion behaviours or assessment domain which might be a specific type of skills, ability and knowledge. Objective based or objective-referenced test refers to items constructed to measure an instructional objective (Popham, 1990). Such objectives are usually formulated behaviourally, describing the type of post instructional behaviour being sought of learners. The tests are teacher made test or evaluation. The objective or criterion – reference test is relevant to this study in that it performs similar function with evaluation questions of a lesson. In both cases questions are directed towards probing a predetermined standard or objectives with aim of ascertaining whether or not such objectives have been achieved. Thus, evaluation questions are linked to objectives as criterion. They are in fact functionally the same types of test. Evaluation usually measures the degree to which students have learned the objectives set out for them. The greater the overlap between what is intended to be learnt and what is tested, the more appropriate are the evaluation questions. Conversely, the less or no overlap between what is intended to be learnt and what is tested, the less or non – appropriate are the questions.

Bloom (1964) categorized the questions that commonly occur in educational settings according to their levels of abstraction. His taxonomy provides a useful framework for analyzing questions to determine their levels in terms of the different behavioural change of the students they seek to probe.

The categories as stated in the proceeding discussion are:

1. Testing students' knowledge
2. Testing students' comprehension
3. Testing students' competency skills of applications
4. Testing students' competency skills of analysis
5. Testing students' competency skills of synthesis
6. Testing students' judgment.

Procedure and Methodology

a. **Sample frame**: The sample frame of the study consisted of all the geography teachers of senior secondary schools of the area. There was a total of thirty-eight geography teachers in the area. The thirty-eight teachers represented the sample frame and the accessible population of the study.

b. **Sampling procedure and sample size:** The simple random sampling method was used to select twenty one geography teachers of the study area. Each and every geography teacher of the area was provided an equal and independent chance of being selected. The list of geography teachers in the study area were obtained from the statistics unit of the Zonal Inspectorate of Education. Each teacher in the list was assigned a serial number, and the lottery method was used to select the individuals that constituted the sample of the study.

c. **Instrument and Procedure for Data Collection:** The lessons plans of the selected geography teachers were the basic instruments used for collecting the data for the study. The Director of the Zonal Inspectorate of Education, Mangu, provided the list of the teachers and subsequently collected the lesson plans of the selected teachers. This, he did through the assistance of the inspector of statistics and records of the Inspectorate. The collection of the lesson plans was done during the routine inspection visit to curtail any form of suspicion of the teachers that would have affected the validity of the instrument.

d. **Method of data analysis:** The data collected for the study from the lesson plans of the geography teachers were analysed using

proportion, chi-square and Pearson product moment correlation coefficient. The appropriateness of the questions was interpreted by the proportion of the questions that tested at least one objectives of the lesson plan relative to all the questions. Adequacy of the question was determined by the proportion of the objectives tested by at least one question, relative to all the objectives in the lesson plan. The diversity of questions was computed in terms of the proportion of the domains of knowledge (cognitive, psycho-motive and affective) tested by at least one question relative to the three domains. For instances if only one of these domains was tested, the fraction is 1/3 with 0.33 as the proportion. The types and forms of questions were analysed using the criteria of Bloom (1964) and Callaham and Clerk (1977). Questions that sought only recall of knowledge and comprehension were categorized as low-level cognitive questions. While divergent questions that tested application, analysis, synthesis and judgment were interpreted as high-level cognitive questions. 0.67 was taken as the minimum standard for significant proportion. This represents a fraction of 2/3 which is large enough to rely upon. The questions were considered appropriate, adequate and diverse on the basis of this norm. The analysis of proportion was used to answer question 1,2, and 3. Chi-square statistics was employed to test hypothesis 1 and 3, while the Pearson product moment correlation coefficient was used to test hypothesis 2.

Results:

Research question one:

The first research question sought to find out how appropriate, adequate and diverse were the evaluation questions asked by geography teachers in their lessons. Data from the lesson plans of the teachers as shown in table 1 reveal that, while 62% of the teachers asked appropriate and adequate questions, only 10% of them asked diverse questions.

Table 1: Appropriateness, adequacy and diversity of questions

	Extent of appropriateness		Extent of adequacy		Extent of diversity	
	Appropriate	Non-appropriate	Adequate	Non-adequate	Diverse	Non-devises
Frequencies	13	8	13	8	2	19
Percentage	62	38	62	38	10	90

Research question two:

The second research question sought to investigate the nature of questions asked by the geography teachers to evaluate their lessons. The data as contained in table 2 show that 48% of them asked low level questions while 52% asked high level questions.

Table 2: Questions types

	Types of questions	
	Low level	High level
Frequency	10	11
Percentage	48	52

Research question three:

Question 3 aimed at determining the relationship between the qualification of geography teachers and the types of questions they asked to evaluate their lessons. The data in the table indicate that 50% of NCE teachers asked low level questions as against 44% of graduate teachers. More so, 50% of the NCE holders asked both low and high level questions in comparison to 56% of degree holders.

Table 3: Questions type and teachers qualification.

	Types of questions			
	Low level		High and low level	
Qualifications	Frequencies	Percentage	Frequency	Percentages
NCE	6	50	6	50
B.Sc Ed	4	44	5	56

Hypothesis 1a

This hypothesis explored the influence of qualification on the appropriateness of questions asked by geography teachers in evaluating their lessons. To test the hypothesis, the teachers were grouped into NCE and B.Sc.Ed holders, while appropriateness of the questions was categorized into appropriate and non-appropriate. This gave rise to a 2 x 2 contingency table that was used for the testing of the hypothesis.

Table 4: Testing the influence of qualification on the appropriateness of evaluation questions.

N	α	df	X^2_{cal}	X^2_{tab}	Decision
21	0.05	1	0.14	3.84	Accept

Based on table 4, the calculated value was less than the corresponding table value. So, the hypothesis was accepted, leading to the conclusion that the appropriateness of the questions that geography teachers asked in evaluating their lessons was independent of their qualifications.

Hypothesis 1b

The hypothesis sought for the influence of qualification of geography teachers on the adequacy of questions they asked to evaluate their lessons. The teachers were sorted into NCE and B.Sc. Ed for the testing of the hypothesis, while adequacy was categories into adequate and non-adequate. This resulted to a 2 x 2 contingency table which was used for testing of the hypothesis.

Table 5: testing the influence of qualification on the adequacy of evaluation questions

N	α	df	X^2_{cal}	X^2_{tab}	Decision
21	0.05	1	0.14	3.84	Accept

Table 5: shows that the calculated value (0.14) was less than the able value (3.84). Hence, there was no basis for rejecting the hypothesis. The Ho was accepted, leading to the conclusion that the adequacy of evaluation questions which the geography teachers asked was not a function of their qualifications.

Hypothesis 2

This hypothesis strived to investigate whether or not, teachers who asked appropriate questions were also capable of asking adequate questions to evaluate their lessons. This was tested by correlating the scores of appropriateness and those of adequacy computed from the lesson plans of the geography teachers, both of which have been defined in the preceding discussions.

Table 6: Testing the relationship between appropriateness and adequacy of evaluation questions.

N	α	df	t_{cal}	t_{tab}	Decision
21	0.05	19	0.429	2.093	Accept

The table shows that the calculated value (0.429) was less than the corresponding critical value (2.093). so, there was no sufficient ground to reject the hypothesis, the null hypothesis was accepted, and logically led to the conclusion that teachers who asked appropriate questions did not ask adequate questions and vice – visa.

Hypothesis 3

The hypothesis was aimed at determining the effect of geography teachers' qualification on the level of the questions they asked to evaluate the extent to which their students have learnt what they taught them as contained in their lesson plans.

To test the hypothesis, the teachers were grouped into NCE and B.Sc. Ed, while the cognitive exploit of evaluations was categorized into those that had low cognitive questions and those that had both low and high cognitive questions. This gave rise to a 2 x 2 contingency table.

Table 7: Testing the effect of qualification on the cognitive exploit of evaluation questions

N	α	X^2_{cal}	X^2_{tab}	Decision
21	0.05	0.308	3.83	Accept

The data in table 7 reveal that the calculated value of X^2 (0.308) is less than the corresponding critical value (3.83), confirming its significance. There was therefore no basis for rejecting the hypothesis; the null hypothesis was accepted, resulting to the conclusion that teachers did not differ in the level of questions they asked on the basis of their qualifications.

Summary and Recommendations

The major findings arising from the analysis of the data collected in the course of this study are summarized below:

a. Geography teachers were able to ask appropriate and adequate questions, but some could not ask diverse questions. Moreso, those who asked appropriate question could not necessarily asked adequate questions. Thus, there was no significant relationship between the appropriateness and adequacy of the evaluation questions of the teachers
b. Only a slight difference was found to exist between the number of those teachers who asked only low level and those who asked both low and high level questions, which were not significantly influence by their qualifications.

From these findings, there is the need for more efforts to improve the quality and diversity of teacher's evaluation questions in order to enhance effective classroom instructions in geography. The researcher therefore recommended as follows:

1. Geography teachers should avail themselves to opportunities of workshops, seminars and conferences on improved methods of teaching.
2. Geography teacher should imbibe the culture of reading current teaching, manuals, handbooks and textbooks to update their knowledge and skills in questioning techniques.
3. School administrators on their parts should closely supervise the teaching – learning activities in schools to guide teachers on how to evaluate lessons.

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