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Teachers' Questioning Techniques in Advanced Level Chemistry Lessons: A Tanzanian Perspective

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Abstract: This study investigated the extent to which teachers' questioning techniques and the way teachers handled students' responses facilitated students' learning and promoted their thinking skills. The study focused on three secondary schools in Dar es Salaam. The data collection process involved classroom observations during chemistry lessons and interviews of 10 chemistry teachers. The findings showed that 80% of the observed teachers had a moderate ability in using questioning techniques to measure students' understanding. The interesting observation in all schools was that teachers interacted frequently with active students and bothered less to involve the least active ones. Moreover, above 80% of all teachers had problems of promoting students' thinking by maintaining a balance between the open-ended and close-ended questions or between convergent and divergent questions. Also, the teachers indicated severe weaknesses in guiding classroom discussions through effective questioning as their abilities in probing were low. Thus, in-service program for these teachers may improve their classroom questioning behaviour.

Introduction

As in other science subjects, the teaching of chemistry involves classroom activities, laboratory and project work. In all these categories of learning, questioning approaches form the framework for students' learning experiences (Chin, 2007; Villanueva-Hay & Webb, 2007; Wu & Hsieh, 2006). This is because, in most cases, questions are used to introduce, develop or conclude lessons and to evaluate students' learning through tests and examinations.

Although research shows that teachers' questioning skills can make students participate productively in scientific practices and discourse (Duschl, Schweingruber, & Shouse 2007, 2), they depend on the teachers' effectiveness for example, it has been observed that many of the practical activities carried out by learners are merely a confirmation or illustration of theory and when the findings disagree with the theory described in the textbooks, learners often fabricate their data in order to obtain the expected results (Viechnicki & Kuipers, 2006, 115). For instance, in South Africa, studies have highlighted the lack of learner autonomy in science practical work, as this is still dominated by teacher demonstrations and 'cookbook' approaches whereby learners merely follow the teacher's directions (Rogan & Aldous, 2005; Seopa, Laugksch, Aldridge & Fraser, 2003).

In Tanzania, the increased enrolment of students in primary schools has led to significant growth in secondary numbers. For instance, according to the Ministry of Education and Vocational Training (MOEVT) (2010); the net enrolment ratio in Form 5-6 increased from one per cent in 2006 to 4.9 per cent in 2010. This situation created a strong demand for teachers in secondary schools and the duration of secondary teaching degree programs was cut from four years to three. However, although the number of teachers in secondary schools grew from 23,905 in 2006 to 40,517 in 2010, the increase did not improve the teacher-student ratio, which rose from 1:29 to 1:40 over the period (MOEVT, 2010).

Both the reduced time for teacher training and the increased teacher-student ratio have implications for the effectiveness of the teachers' classroom practice. However, classroom experience shows that a smaller number of learners in a class does not necessarily mean that the teaching is of high quality, as it depends on how the teacher handles the class (Schulten, 2011). Conversely, a larger number does not necessarily mean that the teaching is ineffective. This is because the effect of class size can be influenced by a number of factors, such as the quality of teacher training, the availability of resources, the extent to which students are motivated and the appropriateness of curriculum (Schulten, 2011). Thus, teachers' classroom practice needs to be examined carefully.

Theoretical Considerations

Questions that guide learning may be classified according to different perspectives. The most common classification is that of Bloom (1956), who suggested that students might be asked to recall facts, to analyse facts, to synthesise or discover new information based on given facts or to evaluate knowledge. Wilson (2002) categorised questioning approaches on the basis of the pattern of thinking they promoted in the learners. He classified questions as being convergent, divergent, evaluative and Socratic, the final three being considered the best for promoting critical thinking, since they highlighted the need for clarity and logical consistencies (Wilson, 2002). However, it should be noted that there are times when one type of question will be more appropriate than another. To determine whether a teacher is using these questions effectively, one should follow the learning cycle which involves: engage, explore, explain, elaborate, and evaluate (Bybee, 1997); and include both divergent and convergent questions in each of the different phases of the cycle (Lewis, 2010). This illustrates the significance of the two types of questions, because there is a need to check for knowledge of some basic facts. However, the memorisation of everything involving science eliminates the innate curiosity students have about the natural world (Wetzel, 2008).

Perkins (1992) is of the view that if we are to instil thinking dispositions in our learners, we have to focus on the way we ask questions to determine whether they promote the ability to make deductions, inductions, adductions, refutations or reflections and encourage creativity. Furthermore, the literature indicates that developing from concrete to abstract thinking; that is, cognitive acceleration among learners in a classroom is possible only if teachers can cause and then maintain cognitive conflict for at least some of the time through close questioning reinforced by apparatus manipulation (Corry, 2005). This may be done by making students manipulate variables while fostering interaction between the teacher and his or her students (Chin, 2003).

Therefore one can conclude that good questions, accompanied by teachers' effective questioning behaviour, foster students' understanding. The questioning behaviour has to be typical of student-teacher interactions that aim to promote students' achievement according to the objectives of the intended curriculum. Establishing such a behaviour needs preparation and usually the first class session should be used to establish guidelines for class participation and discussion and to ask for students' cooperation in implementing these guidelines (Souza, Dallimore, & Pilling, 2010).

It should be noted that students' manipulation of variables in a scientific inquiry requires the use of probing questions by the teacher to enable them to think critically about the relationship between the variables under investigation (Ramnashern, 2011). For probing to be fruitful in the classroom, the teacher should be able to paraphrase his or her questions from time to time because not all students get the key points of the questions asked all the time. The paraphrased question should have a similar meaning or the same thought as the original question; it must elicit the same answer as the original question and show alternative wordings and orders of some words (Exforsys, 2009).

Since a typical classroom is composed of students with diverse cognitive abilities and attitudes, the same style of questioning should be used to draw the attention of the class so that a teacher can continue to reinforce a point, since redirecting a disorganised classroom scene is vital to teaching effectively and having the students learn the required skills (Johnson, 2012). This means, in a class of mixed abilities, teachers should not rely on the same volunteers to answer every question. They should respond to frequent volunteers in a way that indicates they appreciate the students' responses, but want to hear from others as well. In addition, the teachers should reduce students' anxieties by creating an atmosphere in which the students feel comfortable about 'thinking out loud', taking intellectual risks, asking questions, and admitting when they do not know something. One of the best ways to do this is for teachers to model these behaviours themselves.

In science, investigations and laboratory experiments are carried out and much information is collected and processed. When students are asked a question, they need to look back at all the information they have collected to come up with a knowledgeable response (Lewis, 2010). If they are given time, they can go through their data, think about the steps they followed, and formulate an answer they are willing to share in the class. If teachers wait a few seconds to react, as opposed to giving an immediate response, students will feel that their answers are valued and considered (Lewis, 2010).

From these theoretical viewpoints, it seems that it is difficult for a new college graduate to be equipped with all the questioning skills needed for effective teaching in a science classroom. However, the developments in metastrategic knowledge; that is, knowledge which involves activated professional learning that combines personal styles and dominant pedagogical processes (Morgan, 2008), highlight the fact that a teacher who has initially lacked the ability to teach higher-order thinking skills can make considerable progress in terms of applying metastrategic knowledge in the classroom (Zohar & Dori, 2011).

This paper is based on a study that sought to explore teachers' questioning approaches to teaching and learning in chemistry at advanced secondary school level in Dar es salaam city of Tanzania, with a view to identifying strengths, weaknesses, and challenges. Specifically, the study sought to achieve the following objectives:

i. To examine the extent to which teachers' questioning approaches assisted the learners' mastery of the key concepts of the subject matter.
ii. To examine the extent to which teachers' questioning approaches promoted students' thinking skills; and
iii. To examine the extent to which teachers' responses facilitated students' learning.

Methodology

The research design chosen for this study employed a qualitative approach. This design was used because the researchers sought to gain an in-depth understanding of the teachers' questioning behaviours and the types of questions they asked by considering that qualitative approach is an empirical inquiry that investigates a contemporary phenomenon within its real life context (Miner-Romanoff, 2012). The study was conducted in Dar es Salaam city, which has a large number of graduate teachers. It also has among the greatest number of schools in Tanzania (MOEVT, 2010), so it was possible to find teachers of all categories, such as experienced and non-experienced, foreigners and native born, who were needed to obtain the multiple responses for the study.

Only those schools with advanced level classes and subject combinations that included Chemistry were included in the sample. Three schools (one government and two private), labeled 'A', 'B', and 'C' were chosen on the basis of the availability of teaching and learning resources. This is by considering that availability of resources such as textual and non-textual materials or teaching media determines the teaching approach; hence classroom questioning techniques. One private school (C) followed the International General Certificate of Secondary English syllabus (IGCSE) and had more teaching and learning materials than the other schools and the smallest class size (7-25 students): the others ranged from 45 to 65 students. All the advanced level Chemistry teachers in the chosen schools were included in the study sample because they were few in number (three in School A, five in School B and two in School C). For both Forms 5 and 6 classes, each class in Schools A and B had two streams of students studying Chemistry while in School C each class had a single stream (see Table 1 below). Streaming of students in schools A and B depended on the two subject combinations; that is, students who studied Chemistry, Physics and Mathematics and stream of students who studied Chemistry, Physics and Biology.

School	Number of streams	Type of school	Number of students	Observed teachers
A	4	Co-educational	150	3
B	4	Girls	105	5
C	2	Co-educational	9	2
Totals	**10**		**264**	**10**

Table 1: Sample composition

The data collection process involved non-participant classroom observations and unstructured interviews with teachers and students. The researchers also had mobile phones with voice recorder devices; hence the researchers could retrieve both students and teachers' voices after classroom observation whenever required. The four researchers agreed upon the entire procedure for observing and recording the responses before starting the observation including also the focus of the unstructured interview with teachers and students.

Since classroom observation was performed by four different researchers validity and inter-rater reliability of the observation items (appendix I) was determined by doing a pilot study in a school different from the sampled ones. Then, based on the pilot data; intra-class correlation coefficient (ICC) was determined using the SPSSX programme and it was found to be 0.84. Since this value was above the minimum acceptable value of 0.80, it means the researchers (raters) considerably shared understanding of the performance and the rating scale (Gwet, 2010).

However, the researchers still refined the instrument, discussed and further agreed on the other details of the rating pattern such that ICC value calculated after the study increased to 0.87.

Procedures for Observation

The observations for each lesson were undertaken by each of the four researchers independently. Thus, the computed percentages represent the average values from the four researchers. The observations focused on teachers' questioning approaches when introducing, developing and concluding the lessons. The researchers positioned themselves at different places in the classroom to watch both the teachers' and students' practices, which were recorded in a specially designed data entry sheets. The procedure for the observations and the way the percentages were computed including the estimations made for all the 22 items specified in appendix 1 was elaborated in appendix II

The interviews were mainly carried out after the lesson and they were unstructured. The researchers interviewed both teachers and students independent of one another when seeking clarification for issues that arose during the process of teaching and learning. The collected data were summarised and analysed according to thematic areas as presented in the findings section below. Thus, the findings present the merged observations from the four researchers. It means tabulated figures are the average values from the four categories of observations.

Findings

The Extent to Which Teachers' Questioning Behaviour Assisted Students' Mastery of the Key Concepts of the Subject Matter

This section is based on determining the teachers' knowledge on the role of questions when presenting a new concept and assessment of learning. The two Chemistry teachers at School *C* asked more questions per lesson than the teachers in Schools A and B. This indicated that such teachers were more able to allow their students to reflect on the taught concepts than those in Schools A and B (see Table 2 below).

Teachers' ability in:	SCHOOL A				SCHOOL B				SCHOOL C			
	H	M	R	NO	H	M	R	NO	H	M	R	NO
Measuring students understanding	0	2	1	0	0	3	2	0	2	0	0	0
Giving students opportunity for self expression	0	2	1	0	0	4	1	0	2	0	0	0
Making the questions understood by all students	0	2	0	1	0	5	0	0	1	1	0	0
Framing and sequencing questions	0	1	1	1	0	1	4	0	0	1	1	0
Formulating clear questions	0	1	1	1	0	4	1	0	0	1	1	0
Asking for questions from students	0	0	2	2	0	2	3	0	1	0	1	0
Identifying gaps in students' knowledge	0	0	2	1	0	2	3	0	0	2	0	0
Checking for students Reponses and calling for non volunteers	0	0	2	1	0	1	4	0	0	0	2	0

Key: H = High ability, M = Moderate ability, R = Rarely observed and NO = Not observed

Table 2: Observation on teachers' ability to use questioning to assist learners in mastering the key concepts of the subject matter

However, like the teachers in Schools A and B, School C teachers demonstrated low frequency in checking students' responses and promoting non-volunteers. This is by considering data in Table 2 which show that, except for few cases; the ability of the teachers to ask for questions from students or checking for students' responses and calling for non volunteers was either rare or not observed at all.

Also, since few students responded voluntarily to questions asked by the teachers; it seemed that few students benefited from the teachers' questions; for example, when 10 students from each school selected randomly were asked whether they remembered any concept that they learnt simply by asking or answering teachers' oral questions, only 3 students in school A and 2 students in school B could really give any evidence of the concepts learned by asking and answering questions whereas 7 students in school C were able to give evidence. The difference between School C and the other two schools could be attributed to the greater ability of the Chemistry teachers at School C to ask for questions from students compared with the teachers at Schools A and B.

The Extent to Which Teachers' Questioning Techniques Promoted Students' Thinking Skills

This section targets not only the number and level of questions but also teachers' questioning skills. School C teachers asked more questions than those at Schools A and B. The questions were generally of higher levels and they could ask such questions using various techniques (see Table 3 below).

Teachers' ability in:	SCHOOL A				SCHOOL B				SCHOOL C			
	H	M	R	NO	H	M	R	NO	H	M	R	NO
Making constructive ideas from students known to all	0	2	0	1	0	1	4	0	2	0	0	0
Balancing between open and closed ended questions	0	0	2	1	0	0	5	0	0	0	2	0
Balancing between convergent and divergent questions	0	0	2	1	0	0	5	0	0	0	2	0
Questioning using various techniques	0	0	2	1	0	2	3	0	1	1	0	0
Accommodating students intellectual diversity	0	0	2	1	0	1	4	0	0	0	2	0
Allowing for reasonable wait time	0	0	2	1	0	2	3	0	0	2	0	0
Motivating learners through questioning	0	0	1	2	0	2	3	0	1	0	1	0
Asking probing questions	0	0	2	1	0	2	3	0	0	1	1	0
Constructing enough mind stretching questions	0	0	1	2	0	0	4	1	0	2	0	0

Key: H = High ability, M = Moderate ability, R = Rarely observe and NO = Not observed

Table 3: Observation of teachers' ability to use questioning to promote students' thinking skills

The fact that teachers in Schools A and B did not ask challenging questions could be attributed to the nature of the local syllabus which had fewer activities for students, students' low levels of understanding or poor communication skills among both teachers and students. It was also observed that the teachers in these schools could rarely develop students' higher-order thinking skills, except for one in School C and the most experienced teacher in School B, who indicated the ability to do so to some extent. For instance, the teachers' ability to balance between convergent and divergent thinking and open-ended and closed-ended questions was observed to be rare (table 3); instead, the lessons were dominated by the low cognitive skills questions.

The Extent to Which Teachers' Responses Facilitated Learning

This section focuses on the ability of teachers to provide opportunities for students to learn from their own responses. Teachers in School A did not provide opportunities for students to comment on the responses given by others during the lessons except for one teacher, who indicated moderate ability to do so (see Table 4 below).

Teachers' ability in:	SCHOOL A				SCHOOL B				SCHOOL C			
	H	M	R	NO	H	M	R	NO	H	M	R	NO
Promoting discussion from students responses	0	0	2	1	0	0	3	2	0	0	2	0
Using students' responses to change the pace of instruction	0	1	1	1	0	1	4	0	0	2	0	0
Asking students to comment on one another' responses	0	1	1	1	0	0	4	1	0	0	2	0
Responding to students questions adequately	0	3	0	0	0	3	0	2	0	2	0	0
Moderating students' behaviour	0	0	1	2	0	1	4	0	0	2	0	0

Key: H = High ability, M = Moderate ability, R = Rarely observed and NO = Not observed

Table 4: Observation on teachers' ability to deal with students' responses

Regardless of the teachers' teaching experience, none of them could transform students' responses into meaningful classroom discussions using participatory approaches. This observation is partly attributable to teachers' lack of creativity in planning for challenging tasks before and during the lessons. It should also be noted that when students failed to provide correct responses to the questions asked, the questions were then made the subject of students' homework but there were no mechanisms to monitor the students' practices in doing the homework. Moreover, four teachers from the three schools demonstrated a low ability in handling students' responses in a positive way, regardless of their teaching experience.

Discussions and Implications

The ability of teachers to monitor the students' responses and involve non-volunteer students was not observed, except for one teacher in School B, who demonstrated this to some degree. This is an indication that teachers were only evaluating small groups of students who could confidently raise their hands and be identified by the teachers. These were active students who were attentive during the lessons. Responses from these active students made most teachers believe that the same responses would be given by the rest of the students if they were given opportunities to do so. However, this was impractical because the researchers observed that students were not fully involved in the classroom activities.

A study by Sekwao (1991) revealed the negative consequences of teachers' habits of considering the responses of few students in the classroom and recommended that teachers should not be biased toward the more active students. Furthermore, the researchers noted that there were some students who did not grasp the key concepts of the questions asked by their teachers. This does not necessarily mean that the teachers were using language that could not be understood by the students but could probably be attributed to their inability to attract the attention of the less active students and their lack of clarity in questioning. For instance, a teacher in School *B* asked: *'What can we say about Mg considering its position in the periodic table?'*

The teacher wanted the students to explain the reactivity properties of Mg by considering its position on the periodic table of elements, but students responded with multiple answers to the question. The teacher seemed not to appreciate the students' responses as the expected answer was not given; for example, one of the students said: *'Mg has mass number 24 and atomic number 12.'*

Another replied: *'Mg is found with Ca in the same group.'*

Another teacher in the same school asked:
'How is the boiling points composition diagram for a mixture of two miscible liquids obtained?' It seems that this teacher wanted the students to describe briefly the nature of the boiling points composition diagram for a two-component liquid mixture but the expected responses were not given. For example, one of the students answered: '*By carrying out fractional distillation of the two liquid:* 'The students felt that they were always wrong during the lessons and most of them did not volunteer to answer questions; as one of them stated: '*I am afraid maybe my answer is wrong*.'

According to Chuska (1995), the content of questions and the manner in which teachers ask them have implications for the students' responses. In the same vein, it was also noted that much time was wasted and the period ended before most of the students had attained the lesson objectives. This was evident as one of the students commented: '*Chemistry is very difficult*.' Unfortunately the situation makes teachers have low expectations for their students. For instance, one of the reasons given by the teachers in Schools A and B as to why they preferred lecturing without asking questions or asking very few questions was the students' inactivity and lack of a reading culture. The teachers were of the view that effective questioning is possible only if students are active.

Nevertheless, the teachers seemed to overlook the fact that types of questions and the way in which they are asked determine students' responses. Research shows that cognitive acceleration among learners in the classroom is possible only if teachers can challenge learners' minds through close questioning (Corry, 2005). This depends on the techniques used in asking open-and closed-ended questions. Most of the teachers observed in the present study rarely showed any ability to balance between open-ended and closed-ended questions or convergent and divergent questions. Most asked closed-ended or convergent questions that required students to give brief explanations or recall factual knowledge.

Wait time may be significant only when the questions demand that students' think (Jokolo, 2004). It should also be noted that the ability to engage students' thinking relies mostly in the teacher's ability to maintain cognitive conflict by probing. This makes students explore a diverse range of issues, especially during the laboratory work which is very significant in the science curriculum (Gott & Duggan, 2007). This is mainly because the scenario provides suitable opportunities for students to clear out their misconceptions.

Conclusions

This study found out that the extent to which students learn and think in the classroom is determined by not only the teachers' questions or questioning behavior, but also by the way the teachers' handle students' responses. Since ability of the teachers to ask for questions from students or checking for students responses and calling for non-volunteers was either rare or not observed at all, it means most teachers interacted frequently with the active students and bother less with the inactive ones. Moreover, the teachers' ability to balance between convergent and divergent thinking and open-ended and closed-ended questions was observed to be rare. Accordingly, the thinking abilities of the learners were not promoted fully. Also, the teachers could not use the students' responses in encouraging classroom discussions. This observation was attributed to low skills among the teachers, large class size, lack of teaching and learning resources, the nature of the Chemistry syllabus, and low teacher motivation.

Teachers should plan their lessons well in advance, with well-prepared questions for introducing, developing and concluding their lessons. They should use their questioning approaches to engage the least active students in order to improve their learning behaviour. As suggested by the teachers we interviewed, responsible authorities should organise in-service training from time to time to train teachers in effective classroom questioning techniques. Thus, another study on how classroom questioning techniques can be merged appropriately with other classroom practices should be conducted so that teachers can be equipped with up-to-date questioning skills.

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Appendix One
Teachers' Observation Schedule

TEACHER'S SKILL TO BE OBSERVED		H	M	R	NO
1	Ability to use questioning to measure students' understanding of the lesson under study				
2	Ability to provide opportunity for students to express their ideas				
3	Ability to make constructive responses from students to be known to the rest of the class.				
4	Ability to make the questions clear to the entire class				
5	Ability to frame and sequence questions				
6	Ability to formulate clear questions				
7	Ability to promote discussion from students' responses				
8	Ability to balance between open-ended and closed-ended questions				
9	Ability to balance between convergent and divergent questions				
10	Ability to question students using various techniques				
11	Ability to ask for questions from students				
12	Ability to develop students' higher order thinking skills				
13	Ability to use questioning to accommodate students' intellectual diversity				
14	Ability to wait for some time for students to respond especially when high level questions are asked				
15	Ability to motivate learners through questioning				
16	Ability to respond to students questions adequately				
17	Ability to ask probing questions				
18	Ability to use questioning to moderate students behaviours				
19	Ability to conduct periodic reviews with students to identify gaps in their knowledge and understanding				
20	Ability to use information on students' levels of understanding to change the pace of instruction whenever appropriate				
21	Ability to ask students to comment or elaborate on one another's responses				
22	Ability to pay close attention to who is answering questions during class discussion and calling upon non volunteers				

Key: H = High ability, M = Moderate ability, R = Rarely observed and NO = Not observed

Appendix Two
Procedure for Recording the Observations

1) Determining teachers' ability to use questioning to measure students understanding of the lesson under study. If the teacher's questioning approach could address more than 80 percent of the key concepts of the lesson as stated in the lesson objectives (according to the syllabus), the teacher was rated as "High" and "Moderate" if it was below 80 percent to 60 percent, "Rare" if it was below 60 percent and marked as "not observed" if the teacher did not ask any question that assisted the learner in attaining the lesson objectives. The same words were used to label the same categories of percentages for the rest of the 22 features shown in the observation schedule, though measuring different skills. The key feature that the researcher assessed was specified for each skill. The researchers observed 10 lessons for every chemistry teacher sampled, Every time the

teacher showed certain behaviour outlined in the observation schedule, the researchers tallied in the appropriate box. A new observation form was used every time the same teacher had another lesson. Thus, it was an average value of the tallies for a particular teachers' questioning behaviour for the 10 lessons that determined the percentage of the skill assessed and in turn used to rank the teachers questioning skill as high, moderate, rare, or not observed. The rest of the observed skills involved:

2) Percentage of students who could be given opportunities by the teacher to give their views when they demanded so.
3) Percentage of ideas from students that the teacher could communicate to the whole class.
4) Percentage of teacher's questions that he/she could ensure that they were clearly understood to all students in the class.
5) Percentage of questions the teacher could ask in an orderly fashion.
6) Percentage of questions that the teacher could ask using correct and simple language that all students could understand.
7) Percentage of the issues, challenges or questions from students that the teacher could transform into meaningful classroom discussion when there was a need for doing so.
8) Percentage of the lessons that the teacher could ask both closed-ended and open-ended question in a ratio of 1:1.
9) Percentage of the lessons that the teacher could ask both convergent and divergent questions in a ratio of 1: 1.
10) Percentage of the lessons that the teacher could ask questions using various techniques, example, using teaching aids, using various terms and reinforcement techniques.
11) Percentage of the lessons that the teacher could motivate students so that they asked questions.
12) Percentage of the lessons that the teacher was able to ask a question which required every student to think critically for solution and give the necessary guidance.
13) Percentage of cases the teacher received students' responses by considering non-active ones.
14) Percentage of cases the teacher was able to pose for a while after asking a question so that students could think for the answer and continues on the will of students.
15) Percentage of the lessons where all students were motivated to answer teachers' questions voluntarily.
16) Percentage of cases where the teacher was able to respond satisfactorily to students questions.
17) Percentage of the lessons where the teacher could pose a problem to students and then formulate a series of small questions that could guide the students in solving the problem on their own.
18) Percentage of cases where the teacher could modify students' undesirable behaviour using questioning techniques when there was a need to do so.
19) Percentage of cases where the teacher could use questioning to review what students knew before introducing any new concept whenever necessary.
20) Percentage of cases where the teacher could change the style of teaching following students responses
21) Percentage of cases where the teacher could ask one student to comment on one another's responses whenever a need arose, example when the teacher was supposed to know if other students knew the concept given by one student to the same extent.
22) Percentage of classroom discussion sessions where the teacher was able to call upon less active students using questioning.