

## **Questioning strategies used by student-teachers during rural teaching practice**

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### **Abstract**

This research study explored the effectiveness of questioning strategies beginning with, 'what, why and how' as used during teaching practice by student-teachers from Madang Teachers College. A questionnaire with open-ended items was used to obtain the data. Data were analyzed using comparative content analysis with themes drawn from emerged patterns. The study revealed that the student-teachers regularly used questions with 'what, why and how' in the introduction, the body and the conclusion of the lessons they taught, to get feedback, to encourage the children's participation and concentration, and to stimulate critical thinking to attain the intended understanding of the topics. The study also revealed that lack of adequate planning and preparation was often the reason why some student-teachers demonstrated poor questioning skills.

### **Introduction**

Questioning by both teachers and students contributes significantly to effective teaching and learning processes. Teachers are encouraged to use hierarchically classified questions (Bloom et al. 1956) to stimulate different levels of thinking. Bloom's taxonomy has six levels which from lowest to highest are: knowledge, comprehension, application, analysis, synthesis and evaluation. Teachers use low, intermediate and high questions in the introduction, body and the conclusion of the lessons. Students also ask low, intermediate and high questions to the teachers to get clarification better understanding of the topics. Teacher educators encourage pre-service student-teachers to use the different questioning strategies during teaching practice.

First year student-teachers at Madang Primary Teachers College undertake a unit on 'teaching skills'. This unit includes different questioning strategies that enhance the student's confidence in teaching and promote interactive teaching and learning. Furthermore, the lecturers encourage student-teachers to use questions beginning with 'what, why and how' more than the types of questions that require a 'yes' or 'no' answer. Questions beginning with 'what, why and how' encourage or stimulate respondents to express views, opinions and information about topics.

**Research problem, questions and purpose**

The problem investigated in this research study was whether or not first year student-teachers could effectively use questions beginning with ‘what, why and how’ in their teaching practice.

Three research questions guided this study:

- How often do student-teachers ask ‘what, why and how’ questions?
- How do children respond to ‘why, what and how’ questions?
- What were the barriers that prevented student-teachers from asking questions beginning with ‘why, what and how’?

The purpose of the study was to explore particular questioning strategies of student-teachers during teaching practice with an expectation that the findings would assist planners and implementers to improve the current teacher education program. The research project was conducted during six weeks of rural teaching practice.

**Literature review**

Research studies have found that the use of questioning is integral to effective teaching and the learning processes. Some studies, for example, Painter (1996), Marsh (2000), Barry and King (1989) focussed on the use of questioning in teaching to test the students’ understanding of the topics and in turn for the students to clarify meaning.

Painter’s study with five teachers found that all used varied questioning strategies to extend knowledge and to develop new ideas. Similarly, McKenzie (2002) derived from a study of nine teachers in an elementary school that the use of questions beginning with ‘what, why and how’ developed higher thinking skills and creative thinking abilities.

Other studies by McKenzie (2004), Good & Brophy (2000), Marsh (2000) and Painter (1996) supported the findings. Marsh stressed the importance of teacher use of ‘why, what and how’ probing questions to clarify meaning and understanding and to get feedback from students in the teaching and learning process.

According to Good and Brophy (2000), teachers should ask students questions beginning with ‘what, why and how’ to build higher reasoning and complex-problem solving skills. Other studies have attributed the use of questioning strategies by teachers as a positive influence on active student learning (McKenzie 2002, Pithers 1998, Barry & King 1989).

This study endeavours to build on the assertions by Painter (1996), Good & Brophy (2000) and McKenzie (2002) that teacher use of different question strategies enhances the effectiveness of the teaching and the learning process.

## Methodology

The case study approach (Hancock 1998, Punch 1998, Guthrie 1987, Gall & Borg 1999) was employed in this study to enable the researcher to focus on a small sample of participants in a particular location.

An open-ended questionnaire (Mathers et al 1989, Gall, Gall & Borg 1999, Guthrie 1987) containing twelve items was developed to collect the written responses from the participants. Data generated were qualitative in nature. The questions were as follows.

1. How often do you ask questions beginning with 'what' in teaching?
2. How often do you ask questions beginning with 'why' in teaching?
3. How often do you ask questions beginning with 'how' in teaching?
4. In which part/s of the lesson [introduction, body, conclusion] do you ask children questions beginning with 'what, why and how'? Why?
5. Why do you think questions beginning with 'why' could be asked in teaching?
6. Why do you think questions beginning with 'what' could be asked in teaching?
7. Why do you think questions beginning with 'how' could be asked in teaching?
8. List difficulties you encounter in asking children questions beginning with 'what' in teaching?
9. List difficulties you encounter in asking children questions beginning with 'why' in teaching?
10. List difficulties you encounter in asking children questions beginning with 'how' in teaching?
11. How do children respond to questions beginning with 'what, why and how' in teaching?
12. Offer other comments about questioning with 'what, why and how'.

The study involved two male and two female first-year student-teachers from Madang Teachers College. The four participants were engaged in their first experience of rural teaching practice, which lasted for six weeks. Two of the participants taught grade three classes and two taught grade four classes. All four participants had satisfactorily completed the teaching skills unit prior to teaching practice.

Prior to collecting the data, the purpose of the study was explained to the participants. Opportunity was provided for participants to raise questions. Each participant was given a questionnaire. When completed, the data were systematically analysed using comparative content analysis (Lankshear & Knobel 2004). Patterns emerged which formed themes (Kvale 1996) that narrowed the focus of the discussions to enable conclusions to be drawn and answer the research questions.

## Results

The results are presented in the following section. The code FST3 is for a female student-teacher with a grade three class, MST3 is a male student-teacher with a grade three class, FST4 is a female student-teacher with a grade four class, and MST4 is a male student-teacher with a grade four class.

### 1. How often do you ask questions beginning with ‘what’ in teaching?

FST3: In most of my teaching I ask ‘what’ questions. Questions beginning with ‘what’ are commonly used in my teaching because this helps the students to talk more and answer my questions.

MST3: I often ask questions begin with ‘what’ when I am beginning my lesson in the body part of the lesson and when I see a pupil not concentrating. During the lesson I ask questions beginning with ‘what’ eg, what did I say?

FST4: Often I ask questions beginning with ‘what’, when I feel that it is necessary to. Otherwise it is most used in my lessons especially in the body part of the lesson.

MST4: I often use ‘what’ during the introduction and the conclusion sessions so that the students can give straightforward answers, one answer.

### 2. How often do you ask questions beginning with ‘why’ in teaching?

FST3: I use ‘why’ questions during the main activity to find out if students are participating and understanding what is being taught to them. Students are given the chance to differentiate things on their own using their own words and ideas.

MST3: Not so often. This because I feel that I get them confused at times even they get me confused at times. To avoid such problems I don’t use ‘why’ questions often.

FST4: I ask the questions beginning with ‘why’ before I summarise my lessons and only sometimes when I am motivating the class before beginning my lesson.

MST4: Questions that begin with ‘why’ are not really used in my teaching because when I try to use them, students do not give me their answers in full. Also the students find it hard to put their ideas into words.

### 3. How often do you ask questions beginning with ‘how’ in teaching?

FST3: Not often. I ask about twice or once in my teaching generally. But mostly I ask the questions beginning with ‘how’ when teaching science or retelling a story in reading.

MST3: I often ask questions beginning with ‘how’ when I teach mathematics and science lessons to check their knowledge and understanding. With other subjects I do not really use ‘how’ questions, only when necessary.

FST4: Sometimes but not all the time: ‘How’ questions although very good questions to ask pupils, I don’t use them often.

MST4: I often use 'how' questions during maths and science lessons because they require one definite answer. Moreover, only a few times I use 'how' questions in the other subjects.

**4. In which part/s of the lesson [introduction, body, conclusion] do you ask children questions beginning with 'what, why and how'?**

FST3: 'What' questions should be used in the introduction and conclusion to identify what will/was taught in the lesson. 'How' questions should be used in the body with the 'why' questions and during the activity and demonstration part.

MST3: 'What' should be asked in the introduction and conclusion? 'Why' should be asked in the body and conclusion to find if the students have achieved the concept. 'How' should be asked in the body of the lesson.

FST4: They can be asked in the introduction, body and conclusion parts of the lesson.

MST4: Whenever I feel that the question is needed to be asked, either in the introduction, body or conclusion. However, I believe the questions are very suitable to ask especially in the conclusion part of the lesson.

**Why...?**

FST3: The reason is that students are already being taught and given activities therefore in order to find out how much they have absorbed in your teaching, questions such as these should be asked, particularly at the end of the lesson.

MST3: This is because questions with 'what' and 'how' give straightforward answers while questions with 'why' try to make the students think and give answers using their own words from their understanding. The answers should be in long full sentences or paragraphs.

FST4: Because these questions are asked to revise their understanding and knowledge. They are asked to find out if the students have understood the concepts taught.

MST4: Questions beginning with 'what, why and how' should be asked in the introduction part of the lesson because it helps to bring the thoughts of the children to the lesson to be covered; and for the body part because children might have already had some ideas of the lesson so they can express what they already know; while in the conclusion part they are very important to ask to check the understanding of the children and whether the objective has been achieved.

**5. Why do you think questions beginning with 'why' could be asked in teaching?**

FST3: Questions beginning with 'why' should be asked verbally in teaching in order to find out the understanding of the students on a particular lesson.

MST3: Questions that begin with 'why' should be asked verbally during teaching so that students will think critically on what has been taught.

For example, why do you think meteors burn in the atmosphere... or why did we have to wear oxygen gear under the sea... etc.

FST4: This is for the teacher to find out if the students are participating and understanding what is being said/taught. Students are given the chance to think and express their thoughts on what has been mentioned using their own words.

MST4: I think questions beginning with 'why' need to be asked verbally in teaching because the answers that are needed may take many words. When they are asked verbally students give a lot of sentences in their answers compared to writing.

**6. Why do you think questions beginning with 'what' could be asked in teaching?**

FST3: I think questions beginning with 'what' can be asked verbally because this is where the students express their understanding and their views. Also the students answer to the point.

MST3: Questions beginning with 'what' should be asked verbally in teaching in order to find out whether the children can recall what has been taught.

FST4: Questions beginning with 'what' should be asked verbally so that students know what things are, what was talked about in class etc. They broaden the minds of students.

MST4: This is to test the students' ability to think fast and answer questions in the given time allowed. A straightforward answer [short & brief] is required.

**7. Why do you think questions beginning with 'how' could be asked in teaching?**

FST3: This is to help students to give their opinion on a problem or what the question is. It is quite similar to 'what' questions where you ask students to give short or specific answers.

MST3: I think questions beginning with 'how' should be asked verbally in teaching because this will help the students to recall what they have learned.

FST4: Questions beginning with 'how' should be asked verbally in class so that students will have the time to give correct answers.

MST4: It will help students to think hard on 'how' certain things came about either a solution to a problem or anything else.

**8. List difficulties you encounter in asking children questions beginning with 'what' in teaching.**

FST3: I don't really face difficulties in asking questions beginning with 'what' because they are straightforward in teaching.

MST3: Some difficulties that I face in asking children questions that begin with 'what' are when children cannot answer when the question is very simple and clear, and when I cannot construct my questions clearly, which sometimes makes the students confused.

FST4: There is no problem that I face but at times the students get confused and give answers using 'because', which is not right. So I help them to differentiate when they should use 'because', otherwise there is no problem, students give straight answers in a short time.

MST4: Students sometimes don't respond, they sometimes call out answers and give answers with out raising their hands because the question is a redirected question.

**9. List difficulties you encounter in asking children questions beginning with 'why' in teaching.**

FST3: When the question is not understood and I try to explain I confuse myself some times.

MST3: Some difficulties I face in asking children questions that begin with 'why' are: when students know the concept but they cannot sequence their ideas and when I construct long questions.

FST4: Students sometimes find it hard to express their answers in full complete sentences; therefore they give straightforward answers. They do not give examples of their own or state answers using their own words or give reasons to answer a particular question.

MST4: They get me confused at times and I get them confused too. Sometimes students aren't able to answer such questions beginning with 'why'.

**10. List difficulties you encounter in asking children questions beginning with 'how' in teaching.**

FST3: The same difficulties that I face when asking 'how' questions applies; often students aren't able to give correct answers.

MST3: When I am not well prepared I sometimes find it hard to construct questions beginning with 'how'. Another difficulty I face is to construct a best question.

FST4: Some of the difficulties are when I have given them the concept and I want them to answer in their own words. When I tried, I also answered my own questions in my own words.

MST4: I don't see any problem in using 'how' questions when I am teaching because students give me the answers to these questions I give.

**11. How do children respond to questions beginning with 'what, why and how' in teaching?**

FST3: Students respond very quickly when 'what and how' questions are asked. They also respond fast when 'why' questions are asked but the problem is they do not give long full answers and use their own words. They just give short answers.

MST3: Quickly. This is because they are asked during the class. Children respond quickly because the work has either been covered in class or done together on the board.

FST4: When children concentrate on the lesson, they find it easy to respond. Sometimes their answers go in line with the questions when they do not really understand the questions.

MST4: Children respond to verbal questions by answering when they see that the questions that are structured are easy for them to understand. When the questions given are easy for them, they answer quickly.

## **12. Offer other comments about questions with ‘what, why and how’.**

FST3: In questioning strategies, I think the questions that begin with, ‘what, why and how’ should be asked more because this will help the teachers to find out if the students understand the concepts being taught and it will help the students to think more and be creative.

MST3: I think teachers should use a lot of ‘why’ questions so that the students should think hard and answer questions using their own words from their understanding.

FST4: I believe all teachers should use a lot of questions in teaching because it helps a lot for the students to remember what has been taught and for the teachers to know who is learning and who is not.

MST4: From my own opinion I see questioning strategies are helpful techniques because to me as a student, these questions have helped me to understand the content of what I have learnt and as a trainee teacher they help me to see whether the children understand or have concentrated while I taught a lesson and have achieved the lesson objective.

## **Findings and conclusions**

The findings of the study are concluded under the three themes, which also answer the study’s questions. The themes that emerged from the data and highlighted the findings of the study were the:

- regular use of questions that begin with ‘what, why and how’
- importance of using questions beginning with ‘what, why and how’
- challenges that were encountered by the student-teachers in the use of questions beginning with ‘what, why and how’.

### ***The regular use of questions begin with ‘what, why and how’ during teaching and learning process***

It was apparent from the results of the study that the four student-teachers were regularly using questions beginning with ‘what, why and how’ in the introduction, the body and the conclusion of the lessons they were teaching during their rural teaching practice experience.

The study also revealed that the regular use of the questions beginning with ‘what, why and how’ were executed mainly to evaluate the children’s understanding of the topics taught. This finding is somewhat consistent with Marsh (2000) that teachers often use the different questions beginning with



‘what, why and how’ in the teaching and the learning process to get feedback of the topics taught to the children. In particular, Marsh pointed out that ‘what’ questions elicit knowledge, recall of ideas (p.140).

The findings of this study coincided well with Marsh’s view on the questions beginning with ‘what’ but took a step further to discuss the importance of evaluating how children could comprehend concepts taught in the lessons in their thinking processes. This implies that the questions beginning with ‘what’ could be used not only to recall factual ideas of the lessons that were taught to the children but also to assess the children’s prior knowledge of general information about the topic.

Concurrently, the study revealed that the questions beginning with ‘why’ were used to measure the comprehension and the intellectual reasoning abilities of the children. This resonates with Marsh (2000:104) that ‘Why questions elicit reasons for particular actions or events’. Reis (2000:2) shared the same sentiments that the ‘teachers should get into the practice of asking probing questions as this causes the students to develop high order skills’.

The study discovered that the questions beginning with ‘why’ were used to develop the children’s critical thinking processes. This enables the children to analyse concepts and ideas in a more logical way. This means that the questions beginning with ‘why’ were used to develop problem-solving and analytical skills.

On the other hand, the use of questions beginning with ‘how’ according to the study’s findings revealed that the four student-teachers used ‘how’ questions regularly in Mathematics and Science subjects rather than during other nationally prescribed subjects such as Language, Arts, Community Living, Health and Physical Education. This encapsulates the views of Marsh (2000:14) that the ‘how questions elicit information about procedures’.

The study revealed that the questions beginning with ‘how’ were not regularly used in the teacher education program. This means that when ‘how’ questions were not used much in the teaching, a learning gap could have occurred. Thus, the use of questions beginning with ‘how’ is equally important to the questions beginning with ‘what and why’ in teaching as it also serves the purpose of achieving active teaching and learning.

### ***The importance of using ‘what, why and how’ questions in the teaching and learning process***

According to the study, the findings revealed that the four student-teachers were well aware of the importance of using questions beginning with ‘what, why and how’ to get feedback from the children about their learning. The questioning strategies were also used to simulate interest and to encourage greater participation and concentration. This finding relates to Pithers (1998:138) finding that ‘questions may also be used to introduce a topic or to summarise and review’. The four student-teachers mainly used the questions

beginning with 'what, why and how' to conclude and to introduce the lessons. Not only that but the study further revealed that the four student-teachers used 'what, why and how' questions to develop children's intellectual reasoning capacities. This study's finding and Pither's views on the use of questions during lessons was well summarised by Good & Brophy (2000) that the questions beginning with 'what, why and how' could be used to arouse interest and stimulate critical thinking to attain the intended understanding. The authors stressed that 'higher-level questions that admit to a range of possible answers are used to engage students in critical or creative thinking' (p.387).

The findings of the study concluded that the four student-teachers had a clear picture of evaluating the content knowledge of the lessons taught and to raise the children's intellectual reasoning abilities by using questions beginning with 'what, why and how'. The questions were used by the four student-teachers to evaluate the effectiveness of teaching and learning in varying situations and contexts. The four pre-service teachers' thoughts and practices in the use of questions indicated that they would want to be reflective teachers in the future. The importance placed on questioning by the four reflected their concern for the children's education.

***Challenges encountered by four student-teachers in the use of questions beginning with 'what, why and how' during the teaching and learning process***

The findings of the study clearly revealed that the four student-teachers encountered challenges in using the questions beginning with 'what, why and how' during their rural teaching practice experience. The challenges were encountered both by the student teachers and the children they were teaching, particularly in relation to 'why' questions.

In the use of 'what and why' questions, the findings indicate that the poor construction of questions frequently confused the children and resulted in poor responses. This answers the study's guiding question 'How do pupils respond to 'why, what and how questions?' According to Good & Brophy (2000) questions should be appropriately constructed for children to respond. The authors stressed that 'vague questions can be responded to in many ways and their ambiguous nature confuses students' (p.390).

The four student-teachers became mixed up in the use of 'what and why' questions with the classes they taught during the teaching practice program. The findings of this study are in line with Pithers' (1998) view that when analytical questions were not properly structured this may cause confusion in delivering the correct information to the children. Pither highlighted that 'if a question, after a pause and redirect still appears to be too hard to answer, it could be rephrased' (p.1430).

The student-teachers need to develop the skills to frame questions beginning with 'what and why' to facilitate the thinking skills students need to frame appropriate responses. There may be many factors that hindered the ability of

the student-teachers to frame questions appropriately. One could be that the student-teachers lack the background knowledge on questioning skills. Another factor could be that the student-teachers may not have been effectively engaged in wider use of questioning skills that could empower them in the first instance to develop self confidence in constructing and using questioning strategies prior to the teaching practice program. Training programs for student-teachers should provide them with the necessary grounding in questioning techniques so that they are empowered to translate them into practice when in the classroom.

Planning and preparation of questions is necessary for beginning teachers to perform effectively. The findings indicate that the student-teachers encountered difficulties in constructing questions because they were not well thought out beforehand. The findings of the study relate well to Good & Brophy (2000) claim that vague questions emerge from lack of planning proper questions. Lack of adequate planning also leads to questions not being well sequenced or varied in format and integrated into teaching and learning processes.

Therefore, there are a number of findings which could answer the study's question: 'what were the barriers that prevented student-teachers effectively using questions starting with 'what, why and how?'' One could be the training and preparation they received at college prior to going on teaching practice. Another could be the modelling of skills by teacher educators at the college. Another could be the literacy skills in English of the children or student-teachers themselves. Another could be the extent to which the student-teachers plan the questions for the learning they intend to occur.

The proper planning and preparing of varied questions is of paramount importance to enhance active teaching and learning. The questions beginning with 'what, why and how' need to be sequenced and planned from simple to complex for the children to be actively involved in the lessons. Such an approach would enable better teaching and learning from the introduction to the conclusion of lessons in all subjects.

### **Implications of the study**

On the basis of the findings, the following recommendations are made.

That the teacher educators engage the student-teachers more on the use of questions beginning with 'what, why and how' in school experience, micro teaching and peer teaching programs prior to teaching practice to enhance their confidence and competence.

That the teacher educators model different lessons more often using the questions beginning with 'what, why and how' for student-teachers to observe, imitate and to emulate in their own teaching practices.

That the teacher educators engage experienced field teachers to demonstrate lessons on the skilful use of questions beginning with 'what, why and how' for

student-teachers to observe and then to imitate and emulate in their own practices on how to use these questions.

That the student-teachers take time in planning and preparing questions with 'what, why and how' from lower to higher levels of thinking as appropriate for different stages of planned lessons.

That questions beginning with 'what, why and how' be integrated into programs by all strands (Mathematics & Science, Language, Social & Spiritual, Community Development and Professional Development) across the college.

That an elective or option course on different questioning strategies be developed and offered to the student-teachers wishing to enhance their knowledge and skills in this field.

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