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# Refining geography teaching : an error analysis.

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# CHAPTER 5

# CONCLUDING DISCUSSION WITH RECOMMENDATIONS

## 5.1 Overview

In the previous chapter I have shown that pass rates in Geography performed fairly well since 2001-2005 and by so doing they disconfirmed the perception that students' performance was declining since 2000. Nonetheless, there were frequent errors that students made in answering examination questions and this suggested a need to find ways in which errors could be corrected to enhance student performance. The key informants have suggested solutions to address these errors at different levels of cognition: Knowledge, Comprehension, Application and Analysis. In this chapter, I argue whether there is a decline in student performance in Geography, errors students made, their frequency as well as how these could be corrected.

## 5.2 Discussion of the research findings

Key findings from each of the research questions will be discussed.

The first research question concerning the decline of performance revealed that it was widely believed that there was a decline in Geography since 2000. In addressing this issue, findings revealed Geography pass rates not declining and showing great stability with very little variation. The analysis of all subjects and core subjects reveals that Geography locates within the third level (70%+ pass rates). Similarly, when benchmarked against the S.A Matric Geography, pass rates still performed more or less similar though with a 2.6% average lower. One study (Atetayo, 2005) that has not considered the decline of performance but achievement levels resulting from gender differences, reveals that boys performed better than girls in senior secondary school certificate in Financial Accounting between the years under consideration implying that the sexes of the students influence their performance at the subject. Similarly, another study (www.nagb.org, 15 November 2007) that viewed performance with respect to gender differences shows that males performed better than females at grade 12 in Geography. Males reached 73% at basic level while females reached 67%. Basic level requires among other things that students possess knowledge of concepts and terms commonly used in Physical and Human Geography. Despite the fact that students in Geography performed consistently well throughout the study period, the study has enough evidence that students made many errors while responding to the examination questions.

Secondly, with respect to the frequency of errors students made, findings show two categories: Geographical and Non-Geographical errors. Out of the seven error categories in the Geographical knowledge, 'Error in content knowledge' is the most frequent with a frequency of 480 which amounts to almost all the other errors together. This frequency is an indication that the major problem with errors has to do with retrieving the acquired knowledge which students did not do. Research (Chinodya, 1997: 73) confirms that students have a problem retrieving what they have been taught as reflected in this statement "students lose about 50% of the material they have learnt just one day after learning it and after five days their recall rate is down to 15%". If students lose so much within this short space of time, how much will they lose after a long time because normally it takes time before examinations are written? This implies that teachers also need to teach study skills for instance, teach students to always make sure they read and understand a topic thoroughly before they proceed onto the next. This will help in boosting their memory. However, there is also ample evidence that teachers as well can contribute to the errors students make as revealed in one study (Gess-Newsome & Lederman, 1999) that examined pedagogical content knowledge of pre service teachers which shows that teachers made errors with the content and were unable to provide answers to students' questions and their knowledge of geometry also had indirect consequences in their classroom practices. They often could not answer the questions about content from assigned homework problems. The pre-service teachers demonstrated a limited, ordered view of geometry.

With respect to the Non-Geographical errors, 'Error in interpreting examination questions' had the highest frequency of 88 which was almost the total of all the other Non-Geographical errors. This error also reflects in the Examiners' Report (2001) that "some students did not have sufficient command of English Language to understand some of the questions and to express themselves". Nonetheless, not only Basotho students are struggling to learn and understand the English linguistic structures, studies carried out with the native speakers of English show that, even first language English speakers are alienated by scientific discourse because it differs from English of everyday usage (Haliday & Martin, 1993 in Thamae, 2006: 10).

With respect to the common errors made in examination in Geography (Geographical and Non-Geographical knowledge) the majority of errors seem to be in Physical Geography more so than they were in Human Geography and Map Reading. Errors were made particularly in river processes especially in deltas, and in weather and climate especially in weather

instruments and in weathering. Clearly, students encountered more difficulties with Physical Geography than they did with Human Geography and Map Reading. The literature does not show errors in terms of frequency and those which are common in Geography but shows that performance declines because students did not do well in one aspect of Geography. Studies (www.cxc.org/SchoolsReports/June2004, accessed, 27 April 2006) confirm that, countries showed a similar decline in the Caribbean Advanced Proficiency Examinations in Geography (CAPEG) in May/June 2004. Results show that mean scores of the examination were reduced by the fact that the performance on the Physical Geography components was weak compared with the Human Geography. To account for the differences in performance between Physical and human Geography, the fact that Physical Geography involves scientific knowledge research shows that Science involves highly classified, specialized, pure and uncommon sense knowledges (Bernstein, 1976) and so it becomes difficult for students to understand that is why they do not do well in it as opposed to Human Geography which allows students to draw from their every day experiences because it allows common sense knowledge.

In response to the third Research Question which focuses on the correction of errors, key informants have argued for pedagogical strategies to correct errors, the most outstanding being: teaching aids, excursions, giving students practice with past examination papers and definition of concepts to correct errors within the four categories of cognitive behaviour: knowledge, comprehension, application and analysis. Although the corrective strategies are similar, the correction argued for differs: for knowledge it is meant to assist students to know the concepts, with comprehension to understand, in application to use the procedures and principles acquired in a practical situation to solve a problem and in analysis to be able to analyse geographic content. One study (Kali, 2006: 67) that focused specifically on the problems students have with regard to the interpretation and drawing of graphs, adopts similar strategies. Findings show that these can be corrected by paying more attention to teaching of interpretation and drawing of graphs by giving students enough practice such as paper-based exercises after a combination of a basic lecture where teachers take full responsibility to teach basic knowledge of graphs. However, with advancement of technology students could always use computers to do the work. On the contrary, the key informants have suggested that students should learn to draw diagrams on their own.

In another study (Thamae, 2006) that considered misconceptions that Basotho students had about earthquakes, (Sutton & Tse, 1997) show that a teacher centered approach is appropriate for teaching Geography in some developing countries including Lesotho. They argue that, the

learner centered methodologies encouraged by progressive science educators have little appeal to Basotho students because they have been brought up like Chinese to respect the wisdom and knowledge of their elders and so this attitude gets transferred to school where they have to respect the knowledge and expertise of their teachers. This methodology seems to put values and morals at the expense of the purpose of education. However, Brunner, Suchman, Austel in (Brown et al 1982) viewed this methodology as violating the principle of learning through active involvement and most importantly, it reduces students to passive recipients of ideas and does not encourage enquiry or creative mind. For teaching and learning to be effective both parties: the teacher and the learner need to be engaged, the teacher providing guidance and the learner constructing his own knowledge. Nonetheless learner centered teaching can still take place with learners respecting the knowledge of the teacher. Other studies have found completely different strategies for instance; principles such as integration, learner-centeredness, relevance, participation and ownership, and group-work to be considered during the teaching of percentages in OBE Mathematics (Mdaka, 2007: 61).

Key informants have argued for the pedagogical strategies as opposed to the design of the curriculum to refine and develop it. They have given a few teaching strategies which they feel are necessary and will do well in addressing the problems of errors in Geography in this study not only to maintain the performance but also to see to it that is improved. Key informants have argued for pedagogy to help students learn the basics, understand them, be able to apply and analyse them.

## 5.3 Recommendations

Some recommendations will address 3 issues: one, the perceived decline of Geography pass rates, two, error frequency and types and finally, what to do about the errors.

### 5.3.1 Recommendations on improving students' performance in Geography

#### 5.3.1.1 Thorough teaching of Geography

Teachers need to take the responsibility to giving more attention to teach the basic content thoroughly in the three broad categories: Physical Geography, Human Geography and Map Reading. They need to use appropriate teaching strategies to make learning more meaningful and to enable students to acquire content knowledge. Teachers also need to make sure that students' progress is assessed as this will give them a chance to identify areas where they have problems.

#### 5.3.1.2 The use of Language in teaching Geography

Language plays a very important role in transmitting Geography. It is important that teachers have an understanding of how they use language for conceptual development within the classroom. Like any other subject, Geography has its own discourse which when expressed in English can cause errors in the examination. It would be useful for teachers to use simple English so as to create an environment in which students can access the linguistic structures because it is only when they understand English that they will be able to understand the concepts.

#### 5.3.1.3 Instructional Materials

Instructional materials form an integral part of teaching Geography. Words alone cannot convey a message that would otherwise be conveyed with the use of instructional materials. Words are easily forgotten but visual materials will long be remembered and so they are an effective means of facilitating students' understanding of concepts. It would be necessary to use instructional materials to teach Geography to correct errors. It is also advisable that instructional materials are collected and kept safely in the school library so that they are accessible whenever a need arises.

#### 5.3.1.4 Teaching study skills

Seeing that errors were made in great frequencies especially 'error in content knowledge', there is a need for teachers to teach study skills. These are the skills that will help students retain acquired knowledge and be in a position to retrieve it whenever necessary to correct errors.

#### 5.3.1.5 Interpretational skills

Geography is a subject that involves a lot of pictures, diagrams, graphs and photographs that require interpretation. It is necessary for teachers to step out of content a bit to instill interpretational skills because students need them to interpret not only questions but also to be in a position to read information on diagrams, pictures, photographs or graphs.

### 5.3.2 Recommendations for Further Research

#### 5.3.2.1 What errors need attention most?

Findings revealed that students made many errors. It would be useful to find out which errors need attention most especially because there were many errors that students made in Geography knowledge.

#### 5.3.2.2 Why more errors in Physical Geography?

It would also be useful to find out why students made many errors in Physical Geography more so than they did in Human Geography and Map Reading.

#### 5.3.2.3 Do pedagogical strategies improve pass rates in Geography?

It would be useful to find out if the pedagogical strategies as suggested by the experts to Geography studies improve COSC examinations in greater numbers.

## 5.4 Concluding Remarks

This study analysed the patterns of students' performance in all COSC subjects, core subjects and benchmarked the Geography performance with that of S.A. Matric. The study also indentified errors that students made in answering examination questions and established corrective strategies in order to improve students' performance in Geography examinations. The major findings of the study suggest that pass rates are not declining in Geography and so there is a need for Geography teachers to integrate suggested pedagogical strategies into Geography teaching not only to maintain Geography pass rates but work towards improving them. Seeing that so many errors were made in Physical Geography more so than they were in Human Geography and Map Reading, there is a need for teachers to use suggested pedagogical strategies and pay more attention into teaching basic content so that students understand it, to help them apply the content learnt and also be in a position to analyse geography concepts. Key informants have argued for pedagogical strategies that teachers need to use not only to make sure pass remain the same in Geography but to make sure that they are improved. Teachers also need to pay attention to the instructional and assessment procedures they use as these are highly influenced by the need to ensure that errors are corrected and that students pass examinations at the end of COSC because eventually the

success of every education system is judged by the performance of students in the examinations which is taken as evidence that learning has occurred.