

Chapter 4: Methodology

The study was carried out in three state primary schools in a province in South Africa. Following Parlett and Hamilton (1976), methods used in this study include selecting samples by deliberate decision to ensure there is good reason for using the sample to establish worth. Naturalistic observations are used with follow-up interviews to describe what actually happens in lessons. What should be done is established through document analysis, especially from “On Track with Maths” by Barry and Dugmore as text of OBE Mathematics and of C2005. A questionnaire is used to elicit the informants’ perspectives and understanding about OBE approach to teaching as per C2005 (copy of Questionnaire attached at the appendix). Matches will be done between what actually happens and what should be done in order to adjudicate the curriculum.

Sampling

Four schools from Limpopo Department of Education were selected for the study. The schools selected were involved with the USAID [Fanang Diatla] project for improving Mathematics, Science and English teaching. The teachers are permanently employed, degreed and have experience in teaching mathematics. Only three teachers in the four schools were visited for data collection and one teacher of the remaining school was lost to the study. The loss of this educator was due to the fact that the window period of data collection coincided with the assessment period of the National Professional Diploma in Education (NPDE) programme. The Grade 7 Mathematics educator of this school was involved with the NPDE programme and had received a notification letter that tutors of the programme were to visit his school to observe his progress. The teacher asked to withdraw from participating in the research activities in order to prepare for the NPDE assessment. The loss of this educator is a loss of important data of the study since he

was a most experienced teacher who also taught mathematics before the OBE curriculum. It was not possible to replace him in the sample collection to this school because it was outside the five weeks window period and the educator would have moved to another different topic by the end of the NPDE assessment. The school could not be substituted because other schools were using different textbooks to the ones selected for the study. The sample teachers were selected because they attended training workshops for teaching OBE Mathematics.

Research instruments

Research instruments used include methods of naturalistic observations, probing interviews, questionnaires and document analysis. These methods were triangulated in order to validate data collected for the study.

Naturalistic Observations

To provide answers to the research question 2, I conducted naturalistic observations in five Grade 7 Mathematics classes of the three sampled schools. A total of 31 lessons were observed. During the observation, what educators and learners said was recorded. Recording was done using pen and paper without a tape or video recorder. What they wrote on the chalkboard was also recorded on the observation sheet. Educators' movements were recorded against time and directions of motion illustrated by broken arrows on an observation diagram sheet (attached on appendix). The observation diagram indicated the classroom plan, the position of windows, door, chalkboard, educator desk, notice board, cupboard and learners' seating arrangements.

Probing interviews

Probing follow-up interviews were conducted immediately after completing lesson observations. Educators were interviewed for about 5 to 15 minutes per lesson probing what they did in their teaching to elicit if it was done as intended in the text. Not for all lessons observed did I manage to interview educators because, amongst other reasons, educators had other learning areas to teach in other grades immediately after those mathematics periods, educators had management issues to attend to at that time, and other matters that needed their immediate attention.

Questionnaire

Teachers also completed a 24-item questionnaire on OBE curriculum issues. The questionnaire had four sections. The first section was about the demographic information. Questions on this section were about the nature of their employment, experience and learners in their mathematics classes. The second section was about the OBE workshop or training that teachers received with regard to mathematics teaching. The third section was about their understanding and perspectives on OBE principles. Questions in this section aimed at examining teachers' understanding, attitude towards OBE principles and also the ability to define their roles within OBE mathematics teaching. The last section was about their OBE mathematics teaching and the textbook. This section aimed at exploring the extent to which the textbook as an 'instructional system' guided their OBE mathematics teaching. Teachers responded to all questions by writing using their own descriptive or explanatory words. Their responses are analyzed in chapter 5.

Document analysis

I studied documents in order to explore how they guide teaching of OBE Mathematics. Documents forming the instructional system of Grade 7 Mathematics classes of the sample schools in respect to teaching 'percentages' include the textbook called *On Track with Maths* by Barry and Dugmore (1998), the *Department of Education Senior Phase (Grades 7-9) Policy Document (1997)* and the *Northern Province Department of Education Curriculum 2005 in a Nutshell (2001)*.

Ethical considerations

Letters of permission were written to Department of Education, schools and teachers, and consent forms were signed (attached in appendix). Each educator of the three schools had voluntarily participated in the study. Educators were assured that their anonymity will be maintained. All names used in this study are fictitious and the researcher assured informants that the data would be kept confidential, used only for the study for degree purposes, and later it may be used in an article for publication. After the degree is awarded and article published all data will be returned to informants and/ or destroyed, by latest 2007.

Limitations of the study

The study had some challenges that I want to refer to as limitations as they had an impact on the collection of data. One of the challenges in the study was that Mathematics periods in the three schools were placed at times that were the same or so close to each other to an extent that it could not allow me to travel from one school to the next. This challenge had a limitation that I only could do observations in one school for one lesson per day. A maximum of only two observations could be done in one school that had two classes. Another challenge was that mathematics

periods were either placed in the morning for the first periods or for periods immediately after the first break. This resulted in disturbance of classes by the morning devotion taking much time or by learners taking much time to return from break. One challenge was that teachers were uncomfortable with the proposal of spending consecutive days observing one school, but would opt for the researcher to rotate schools at the same time. This resulted in me observing few lessons and missed continuity as teaching continued in one school while I was observing in another school. One other limitation is that by the end of each observed lesson I was to interview teachers probing on the undertakings of their lessons, but it was not always possible because they either had classes to teach or management work to do.

Analysis of data

Data was categorized or broken down into parts of lessons during analysis. The categorizing and contextualizing strategies of qualitative analysis were employed in order to avoid the risk of missing important insight (Maxwell, 1998). Categorizing, data was broken down and rearranged into categories that could facilitate comparison between content in the same category and between categories. Categories were inductively generated during the data analysis. By contextualizing strategy of data analysis I attempted to understand data in context so as to identify existing relationships among elements of data.

Documents and questionnaire data were analyzed in chapter 5 in responding to the first research question about the ‘instructional system’, while naturalistic observations and probing interviews data were analyzed in chapter 6 in responding to the second research question about the ‘learning milieu’.