

CHAPTER 4: THE RESEARCH METHOD

This chapter will focus on describing how the study was performed, the instruments used; how data sets were obtained and analysed. It will also give an explanation of the ethical considerations and limitations brought to bear during the study.

The study was conducted at the School of Oral Health Sciences, University of the Witwatersrand using participants in the Department of Prosthodontics, i.e., final year undergraduate dental students (BDS 5) and faculty. Following Parlett and Hamilton (1976), methods employed during the undertaking of the project included selecting samples purposively (McMillan and Schumacher, 2006) to ensure that there was good reason for using the sample to establish worth; ethnographic research methodologies including naturalistic observations and probing follow – up interviews (Spradley, 1979, 1980) to describe what actually happened during the lessons, were used.

Documents which were utilised included: the Prosthodontic curriculum, notes from departmental meetings and workshops and information provided to the students via the yearbooks about the programme were also used to inform the instructional system. What was planned for Prosthodontics was established through analysis of these documents. There were no specific ‘curriculum’ documents that mapped out the pedagogical methodologies and philosophies to be used for the delivery of the course, however documentation from the SOHS Teaching and Learning Committee were used for this part of the instructional system.

From July through October of 2007 two staff members / Faculty in the School of Oral Health Sciences who taught in the final year prosthodontics programme were observed during the small group case based problem based learning sessions. Each lesson was scheduled to last two hours and each case was completed over three meetings, therefore, in total twelve hours of lessons equating to eighteen conventional teaching lessons, were observed and recorded. The case based problem based learning sessions running as two hour sessions equate to three 40 minute classroom teaching

sessions. Initially there were three such cases planned for observation, however, the third case based problem based learning session was cancelled by the relevant department (Appendix 1 – notice re cancellation).

The observations sought to record descriptive details about who, where, how and why an activity or social scene occurred. Extended observations of participants in the various contexts, afforded the researcher to elicit data that are almost impossible to obtain with other approaches. These unstructured observations were used to document the staff members teaching behaviours. The purpose of the observations was to describe the activities or behaviours that took place in the setting. It is argued that this would allow the researcher to be open, discovery oriented and inductive because the researcher would be less likely to rely on prior conceptualisations of lesson teaching. It would also allow the researcher the opportunity to discover things that no one else may have really paid attention to and a chance to learn things that people would be unwilling to discuss in an interview (Patton, 2002).

Following the lesson observations, probing follow – up interviews were conducted with both faculty and student participants to delve deeper into the observed phenomena in order to seek clarity on what transpired during the lessons. These also assisted in unpacking any emergent issues which needed to be looked into in detail.

One of the strategies employed during the student participant interviews was to approach the student participants with broad questions regarding several aspects of the prosthodontic programme (McMillan and Schumacher, 2006). This enabled the researcher to obtain the participants perceptions of the programme expressed as tacit and non-tacit feedback - feelings, thoughts, beliefs etc.

The core of seeking and corroborating different perceptions lies in obtaining data from multiple data sources – different persons in different contexts at various times. Trustworthiness of the data was achieved through verification procedures such as using different ethnographic tools such as naturalistic observations of the lessons

(Spradley, 1980), prolonged engagement in the field and triangulation of data. All this was to enrich the argument and build confidence in the findings of the study. In this study, lesson observations, follow – up probing interviews of participants, documents where comparisons were made between what was planned and what actually happened in order to evaluate the course ‘in its own terms’ so as to record the emic perspective and give it voice to add to the worth of the course were the research tools used.

Permission was sought and obtained from the Head of the School / Dean (Appendix 2 – letter of approval from the Dean) to conduct the study. Additional permission was sought from the head of department prior to conducting the study and observing the lessons. Student participants were also informed of the study and permission was obtained from all participating students for consent to be observed and interviewed. All participants were assured on the maintenance of anonymity and their right to withdraw their participation at any point during the study, fortunately none chose to withdraw consent. Participants who were observed signed a letter of informed consent and the nature and reasons for the study was explained to them (Appendix 8 & 9). Ethical clearance (Letter of approval dated: September 27, 2007: PROTOCOL 2007ECE81) was obtained from the relevant ethics committee of the Faculty of Humanities (Appendix 7).

Sampling

Purposive sampling was utilised whereby due to the researcher’s intimate knowledge of the department of prosthodontics in the School of Oral Health Sciences, DLPs (Dental Learning Packages) which had a lot of prosthodontic content were selected. Additionally, staff members who were deemed to have the ability to provide the best information to address the purpose of the study were selected and observed during the lessons. This was done in order to provide ‘information rich’ data. The final (fifth)

year prosthodontics course was also chosen for evaluation as it was deemed to be sufficiently integrated as per the underlying principle of the curriculum innovation being studied. Purposive sampling is done to increase the utility of information obtained from small samples (Schumacher & MacMillan, 2006). The power and logic of purposive sampling is that a small sample / number of cases studied in depth would yield many insights about the topic. In this particular study, two groups of up to twelve students were selected for observation during the execution of the small group problem based lessons for DLPs which had a high prosthodontic content, even though they (the DLPs) were not 'prosthodontics – specific'. The cases were discussed over three contact sessions which were each intended to last for two hours. The lessons were scheduled such that groups met every alternate week, resulting in the lessons occurring over a six week period for each DLP.

Purposive sampling was utilised wherein final year undergraduate dental students and specific faculty were chosen as participants for the study – twenty four dental students and three faculty were observed and two were interviewed. Participation in the study was voluntary. The lessons observed were small group lessons comprising on average eight students facilitated by one faculty. All faculty involved in the study were senior members of the department with extensive subject content and teaching experience. Additionally there were specialists in the field of Prosthodontics especially the branch of Removable Prosthodontics. They had been extensively involved in the planning of the curriculum innovation that informed the hybrid – PBL curriculum in place at the School. All the faculty had at one time or another been part of the educational committee (EDUCOM or latterly known as the Teaching and Learning Committee) for the School.

The decision to use a purposive sample was so that a potentially information rich ~~sample~~ data source was selected in order to have a sample that was most likely to yield fruitful data in order to allow for an in depth study of the phenomenon. Particular faculty from the Department of Prosthodontics who were informative about the innovation were selected. This was enabled by the researcher's knowledge of the

population and judgement as to which staff to select in order to have the best information to address the purpose of the study. The cases studied were selected similarly whereby, only those with an increased degree of prosthodontic management were selected for the study. The decision to observe the final year student group during the case based integrated lessons was also informed by the notion that, as final year students they were better positioned knowledge wise to integrate information derived from various disciplines of dentistry in order to manage the learning required of them during the lessons.

The lessons observed were small group lessons comprising on average eight students facilitated by one faculty. In order to enhance the validity of the study, several strategies were employed, amongst which included:

- a) The use of multi method strategies to allow for triangulation of the data during collection and analysis
- b) Recording participants verbatim accounts of the learning milieu to capture their ‘voices’
- c) Employing low – inference descriptors to enable the recording of precise, almost literal and detailed descriptions of the people and situations
- d) Utilising audio recording equipment to assist in capturing the participants voices / accounts
- e) Using actual accounts of what happened in order to assist with corroborating the findings
- f) And last but not least, using some of my colleagues to act as ‘devils advocates’ during the analysis of the data in order to check informally on my interpretation of the findings.

Research Instruments

Ethnographic tools used included naturalistic observations, probing interviews and document analysis. In order to validate the data collected, the different research tools were triangulated to increase the ‘trustworthiness’ of the data. The core of seeking and corroborating different perceptions lay in obtaining data from multiple data sources.

Naturalistic Observations

Extended observations of the participants during the lessons, afforded the researcher the opportunity to elicit data that are almost impossible to obtain with other approaches. Field notes were taken during the lesson. Much of the field notes noted how the group interacted, including how the facilitator managed the dynamics in the group and some of what was discussed. The responses were recorded against time. Participants’ sat down around rectangular tables for the duration of the lessons, barring the student who acted as the ‘scribe’ for each particular lesson. This student stood by the whiteboard in order to record on the whiteboard what was being discussed. The seating arrangements were recorded for the small group discussions. The scribe spent most of the lesson at the whiteboard recording points from the discussion. A diagrammatic illustration of where each participant sat was drawn - up (Appendix 3 - seating arrangement at each small group lesson). The observations sought to record descriptive details about what happened during the lessons.

Unstructured observations were used to record the group (participants) members teaching and learning behaviours during the lesson. As stated earlier, the purpose of the observations was to enable the researcher to describe the activities or behaviours that took place in the setting. This was to allow the researcher to be open, discovery oriented and inductive as the researcher would be less likely to come with preconceived notions of how the lessons needed to be conducted. It would also allow the researcher the opportunity to uncover aspects of the teaching and learning

practices that may not have been overt from discussions during the department's meetings and workshops (Patton, 2002). It was hoped that this would provide an extensive description of the learning milieu and help unearth any emergent issues that needed to be followed up on during the interviews, as prescribed by the illuminative evaluation methodology.

Self - monitoring by the researcher for bias is an important element in qualitative research. This is essential for objective reporting of data, as being the primary research tool it poses certain limitations of the researcher as the instrument. The researcher's degree of sophistication in data collection and aspects of personal biography might contribute to bias - be it positively or negatively. This aspect of the research method was an issue that the researcher was cognisant of throughout the study, and will be expanded on further later in this chapter.

Probing Interviews

Follow – up interviews were also conducted, with both staff and students, and these were audio – recorded and transcribed. It was difficult to conduct the follow – up interviews immediately following the lessons due to the participating staff members' prior commitments. The students were also scheduled to different activities following the problem based learning sessions, therefore it was also impossible to interview them immediately following the conclusion of these lessons. Interviews were conducted at a later time, however every endeavour was undertaken to conduct the interviews not long after the observed lessons. This was to mitigate against participants forgetting what transpired during the lessons, so that a more fresh recollection could still be obtained (Appendix 4 – Student and Faculty Interviews).

Discursive, unstructured interviews (McMillan and Schumacher, 2006; Spradley and McCurdy, 1988) was one of the strategies employed during the student participant interviews whereby the student participants were approached with broad questions regarding several aspects of the prosthodontic programme. These provided participant

insights into the course. This also enabled the researcher to obtain the participants' perceptions of the programme expressed in their own voices and feelings. It is argued that this allowed the participants to not feel restricted as they may possibly have had they needed to answer a structured interview schedule with predetermined questions.

Documents Analysed

Documents from the Department of Prosthodontics outlining the programme and the School Teaching and Learning Committee (formerly EDUCOM) minutes were studied in order to explore how they guided the teaching and learning strategies in the said department. Dental Learning Packages were utilised for the study. DLPs are paper – based clinical cases. The format of how the problem based learning sessions run utilised the method as suggested by Schmidt and commonly known as the “Seven Jump” strategy (Schmidt, 1983 cited in Moust, van Berkel and Schmidt, 2005) and formed part of the instructional system. One of the chosen DLPs discussed treatment planning for different socioeconomic scenarios and the other DLP observed involved treatment planning a case for a ‘special – needs’ patient. Both these DLPs had a strong component of prosthodontics consideration. Together, these documents made up the instructional system which was used for the study (Appendix 5 & 6 - IS & DLPs documents).

Documents that were studied included material with information on the aims; intentions; content and context; competencies expected of the dental students in the discipline of Prosthodontics and the actual ‘paper cases’ that formed the DLPs. These documents, therefore, had the potential to act as an information source on the instructional system. These documents were scrutinised and analysed, using a selection of techniques for qualitative content analysis (McMillan and Schumacher, 2010) including:

- i) Locating the documents and sourcing them from the various offices such as the Department of Prosthodontics administrative office and The SOHS Teaching and Learning committee chairperson.
- ii) Identifying the relevant sections within the sourced documents that relate to the study and provide a source of information to assist with understanding the instructional system.
- iii) Critically analysing these identified documents to best serve the purpose of the study.

In instances where clarity was needed relating to any aspect of the documentation, faculty within the department availed themselves to informal discussions to assist in obtaining a better or increased understanding of the documentation. Faculty were also used to play the ‘devil’s advocate’ role and to assist in self – monitoring for bias in order to ensure objective reporting of data (Mason, 1996 cited in Behar – Horenstein, Mitchell and Dolan, 2005).

Part of the aim of this study was to add some degree of improvement of educational practice to the Prosthodontic programme at the SOHS (McMillan and Schumacher, 2006).

Ethical Considerations

Written formal permission was sought from the Head of the School of Oral Health Sciences to conduct the study. Verbal permission was obtained from the Head of the Department of Prosthodontics and informed consent was solicited from all the study participants – students as well as staff members who facilitated the lessons.

Participation in the study by all was voluntary and it was explained that participation could be cancelled at any point during the study. Participants were assured that their anonymity would be maintained and particular care was noted regarding the power

relations between the student participants and the researcher due to the fact that the latter was part of the teaching staff in the department where the study was being conducted. All names used in the study are fictitious (in both the lesson observations and interviews) and the researcher assured the participants that the data would be kept confidential, used only for academic purposes. The raw data was only available to the researcher. After completion of the degree and following publication in an academic journal, all data will be destroyed.

Analysis of Data

In order to make sense of the observational data and the interview transcripts obtained from the participants during the study, data was broken down into themes / codes during analysis and categorised, thereafter relationships between these categories were sought and acknowledged and themes identified. This will be discussed in chapter 6. Themes were inductively generated during data analysis, although I had started with a limited number of predetermined descriptive categories in order to facilitate the data analysis stage, following Miles and Huberman (1984).

Analysis of the interviews consisted of thematic analysis which was inductively generated during the data analysis (Miles, 1981). Interpretation of the themes and coding data was a collaborative effort between the researcher and faculty within the department who had extensive experience in prosthodontics and educational experience. Collaborating on identification of the themes was done using that suggested by Denzin and Lincoln (2005) so as to eliminate bias or assumptions that may arise when data is reviewed. The technique used for thematic representation and data coding used some aspects of those suggested by Taylor and Bogdan (1998). This protocol included:

1. Looking for words and phrases that capture the meaning of what is said

2. As a theme is identified, comparing statements with other subjects and seeing if there is a concept that unites them and
3. As different themes are identified, looking for similarities between them.

Limitations of the Study

Several factors raised limitations with the study. Included amongst these was the difficulty in having the opportunity to observe all the different contexts for teaching and learning opportunities in the department. There were several different teaching and learning opportunities available such as clinical sessions; tutorial sessions and integrated learning sessions / platforms. In the clinical sessions students are involved in the actual clinical treatment / management of 'real life' patients and are responsible to render all the clinical requirements for patients. This is instituted under supervision by qualified dentists and specialist prosthodontists. The tutorial sessions concern themselves with delivery of the majority of the didactic programme where the theory which informs clinical management is taught. The integrated learning sessions / platforms bring together several disciplines for the discussion of multidisciplinary clinical cases. This involves the discussion of management / treatment strategies for paper cases where the required treatment is not confined to one discipline only.

As mentioned earlier another limitation was due to the scheduling constraints which did not allow for immediately interviewing participants following the lessons. This may have resulted in some participants forgetting details of what had transpired during the observed lesson. Additionally, cancellation of one DLP later in the programme reduced the number of possible observations. More lesson observation may have enriched the data source.

The absence of a prosthodontic specific DLP was a major limitation as one could not specifically look at the content given during the lessons against what was planned. As the DLPs were multidisciplinary cases, the prosthodontic content had to be looked for amidst the rest of other discipline content. However to minimise this limitation, DLPs with a high prosthodontic content were selected for observation.

The fact that the curriculum was a hybrid – PBL curriculum, and not totally PBL based, meant that the clinical disciplines teaching was mainly traditional (conventional) based, i.e., lecture based and ‘teacher – centred’. However, the department used in the study had undertaken to shift and align their teaching and learning strategies with the principles informing the innovation. The hybrid nature of the curriculum provided its own challenges in that delivery of content from different courses may not be aligned with each other to ensure temporal delivery of content between different departments.

As the researcher was a principal member of the department and was the person conducting the interviews, this may have had some degree of influence on data collection whereby the students may not have felt free to express their views openly. This was countered by actively reassuring students that their comments would never be used against them, and instead were to be used for the purpose of the research study and providing feedback to the department to modify and enrich the course. This could impact via uptake of the positive aspects of the programme that the students identified and curtailing those aspects of the programme that were deemed negative on the learning process wherever possible.

Other issues that needed to be considered with the employment of ‘researcher as instrument’ included the researcher’s degree of sophistication in data collection and aspects of personal biography that might have contributed to bias (Locke, Spirduso and Silverman 1993 cited in Behar-Horenstein, Mitchell and Dolan, 2005).

A challenge experienced was the missed opportunity to observe every aspect of the different components of the prosthodontics programme. The observational opportunity derived only extended to the small group problem based learning teaching sessions / lessons. This was basically due to personnel challenges in the department as the researcher was also an active member of the teaching staff and could not be released from some of the department duties. However, being a member of the department that was being employed for the study, invaluable experience pertaining to the programme was had.

Furthermore, the follow up probing questions could not be scheduled immediately following the lesson observations as both students and faculty in most instances had other commitments following the lessons. The interviews were thus scheduled some time after the lessons. However, an attempt was made to schedule these not too long after the lessons were observed, i.e., within a couple of days following the lesson observations. With some of the student interviews, it was possible to follow up a few hours after the lesson observations.

Documents outlining the instructional system were also not readily available, and a lot of reliance was placed on discussions between the researcher and professorial faculty within the department especially when analysing the philosophies underpinning the pedagogy used. This was also assisted by the fact that the researcher had been an integral part of the problem based learning component for the school curriculum and therefore had an insider view of what was expected.

Conclusion

As explained in this chapter, the study used the illuminative evaluation methodology, within the qualitative research paradigm. The phenomenon under observation did not rely on studying preordained theory or criteria. This served as a basis for the eventual research findings. Due to the descriptive and interpretative nature of the study, there would be a degree of subjectivity with the study findings, however, because an increased effort went into injecting ‘trustworthiness’ into the research methodology and interpretation of the findings, it is suggested that the research design described above resulted in findings to which a high degree of validity can be ascribed.

The study focused on observing a single educational phenomenon within the prosthodontic department, its findings can therefore not be ascribed to the whole curriculum encompassing all the disciplines within the SOHS, nor to every aspect of the prosthodontic curriculum. Nevertheless, the study does provide insights into how the department had aligned its teaching and learning practices with the principles underpinning the curriculum innovation within the school. It is hoped that the findings may be used with findings from other research studies on similar curricula and be taken up at the observed school by the different disciplines to align and refine their programmes positively. It is also hoped that other institutions elsewhere with similar curricula can use these findings comparatively to enable generalisations to be drawn and thus enrich the teaching and learning in dentistry.