Chapter 4

Research methodology

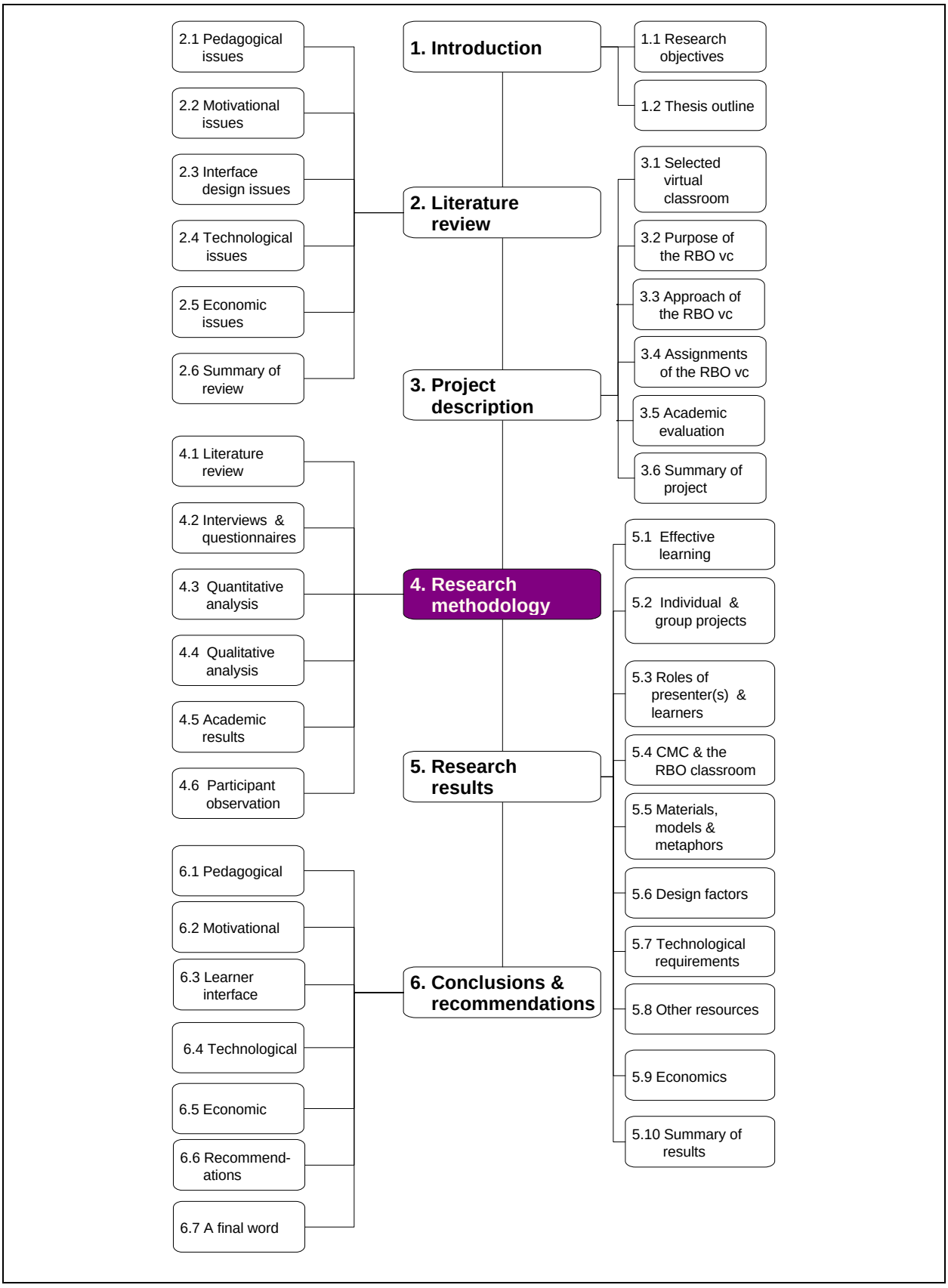
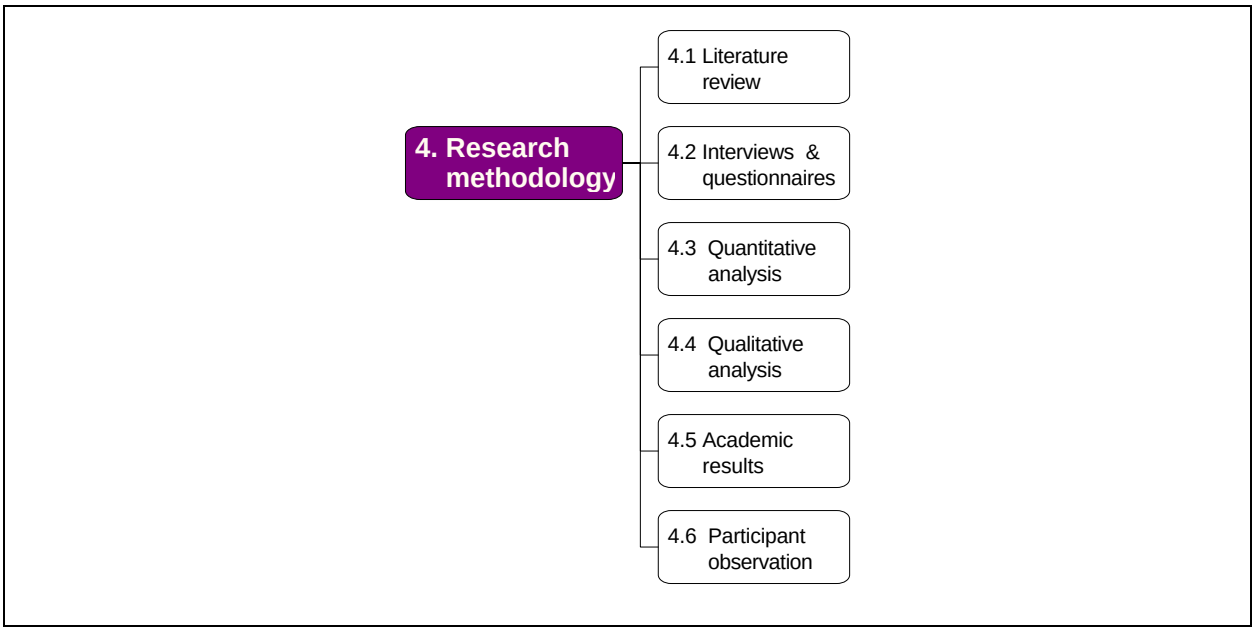


Figure 4.1 Outline of Chapter 4



To obtain answers to the research questions a variety of methods were implemented. Triangulation, the use of a number of alternative measures to answer each question, was applied to improve the reliability of conclusions.

Table 4.1 overleaf presents an evaluation matrix recommended for research into multimedia (Reeves, 1997), which juxtaposes questions and sub-questions of this research project and the research methods implemented.

4.1 Literature review

A review of relevant literature based on the research questions and which contextualises this analysis, is presented in Chapter 2.

4.2 Interviews and questionnaires

The interview with the course leader concerning setting up the classroom, its goals, achievements, challenges, constraints and successes, was conducted via one-to-one email and consisted of 68 questions on nine aspects. The questions posed in the structured interview are presented in Appendix A. The course leader's responses were analysed qualitatively.

Table 4.1 Matrix of research questions and methods

Methods / Questions	Literature review	Comparison of course marks with other courses	Email interview with course presenter	Responses from students to emailed question-naires	Quantitative analysis of email messages	Qualitative analysis of email messages	Participant observation by researcher
1. To what extent can a Web/email delivered course facilitate and enhance learning?	✓	✓	✓	✓			✓
2. To what extent can it facilitate individual and group projects?	✓	✓	✓	✓			✓
3. How does the course delivery method affect learner/ presenter roles?	✓		✓	✓	✓	✓	✓
4. To what extent can it facilitate adequate and effective communication among learners and between learners and course presenter(s)?	✓	✓	✓	✓	✓	✓	✓
5. To what extent can it provide materials, models and metaphors that elicit learner motivation?	✓			✓	✓	✓	✓
6. What design factors best facilitate learning via Web-based material?	✓		✓	✓			✓
7. What level of computer/ telecommunication equipment is required?	✓		✓	✓			
8. What other resources are required?	✓		✓	✓			
9. What costs are involved in on-line course:							
• development	✓		✓	✓			
• implementation	✓		✓	✓			
• delivery	✓		✓	✓			
• support/ maintenance	✓		✓	✓			
• evaluation	✓		✓	✓			
• access?	✓		✓	✓			
10. To what extent can this approach generate cost savings for:							
• presenters and	✓		✓				
• learners?	✓			✓			

Three questionnaires were emailed directly to student course participants. The U.K. based external observer sent one while the researcher sent the remaining two. Response to questionnaires was voluntary with confidentiality assured.

The U.K. observer's questionnaire focused on how students perceived the course at the halfway mark. This questionnaire is presented in Appendix B. Seven of the ten students still enrolled for the course responded. Only a summary of responses to this questionnaire was made available for inclusion in this study.

The four students external to the M. Ed. course who left the course cited time constraints as their reason for leaving. The other two who left were M.Ed. students enrolled for this course as an optional extra. Their main reason for leaving was inadequate facilities from their Internet Service Providers. As their links were only set up as the course began, these problems proved critical. In addition, one of these students experienced a severe computer crash as the course started.

The second questionnaire was concerned with learner perceptions and experiences of collaborative group work via the virtual classroom. This was sent out after completion of the group projects. Six of the nine students involved across the three completed collaborative group projects responded to this questionnaire, which is presented in Appendix C. The responses to these questions were analysed qualitatively.

The third questionnaire (see Appendix D) was emailed to students after completion of the course and was concerned with perceptions and experiences of the on-line course. There were eight responses to this questionnaire, including those from the two M.Ed. students who had left the course in the early stages. All these responses were analysed qualitatively.

4.3 Quantitative analysis

All messages sent to the classroom email list were summarised quantitatively with respect to their:

total, daily and weekly frequency;
timing over days of the week and hours of the day;
the targets of messages;
the senders of messages;
the chosen language (Afrikaans or English);

the type of message, whether it was an initiator of a thread or a response to a previous message;
main topics of messages, and
detailed content of messages.

4.4 Qualitative analysis

Quantification of email interaction provides only a narrow view of the nature of computer mediated communication and overlooks aspects of how it is embedded in the learning environment (Mason, 1995).

Additional approaches to assess the nature of communications focused on an analysis of content or topic(s) and the level of interactivity of messages exchanged among the students and the course presenter.

Interaction by email is characterised by the pursuit of multiple topics in parallel, so called "multiple threads" (Black et al, 1983; Quinn et al, 1983; cited in Levin et al, 1990, p.192). As analysis of messages that counted each message as a single unit took insufficient account of this multi-threaded nature of messages, a further unit of measuring messages or *text unit* was devised to facilitate message act/purpose and content analysis. A text unit was defined as any paragraph of contiguous combination of paragraphs in a message that presented a discrete topic or idea.

Qualitative analysis methods to trace the message threads and the nature of interactivity included adaptations of *inter-message reference analysis* and *message act analysis* (Levin, Haesun and Riel, 1990).

Inter-message reference analysis checks if or which messages are referenced by messages that follow them. This method was used to establish the extent of referenced messages, the type of messages referenced, and whether referencing crossed role boundaries, for example, between student and course presenter. Message act analysis focuses on the intention and topic of a message.

To facilitate analysis of the threads of discussion, the text messages were imported into QSR Nud*Ist™ Version 4, (Qualitative Solutions and Research; Non-numeric Unstructured Data Indexing Systematising and Theorising), a computer software package for qualitative data analysis. This software package facilitated extraction of the themes and topics of the multi-threaded messages. In addition, together with SPSS™ Version 6.13, it also facilitated the quantitative analysis referred to in Section 4.3 above.

4.5 Academic results

Another measure of learning effectiveness was provided by student results for the RBO course. For comparative purposes, access to the results of the seven second year M.Ed. students for three other courses was provided. The RBO course presenter had presented these three courses.

4.6 Participant observation

As the researcher was also a student of the RBO virtual classroom, participant observation and direct experience was possible concerning the on-line course and email interaction.

Researcher reflection on the experience of learning via the classroom informed a number of interim Web-based projects on aspects of the classroom, contributed to the design of this research project and provided a framework for the analysis of the results of the investigation.

An analysis of results generated by the research methods outlined above, is provided in Chapter 5.