
CHAPTER 5

RESEARCH DESIGN

5.1 INTRODUCTION

The research aim in Chapter 5 was (see par. 1.3)

- To determine quantitatively to what extent effective schools make use of TQM, and to what extent elements of TQM could be identified in these schools (quantitative research), and
- To determine qualitatively whether the strategies employed in schools are based on TQM assumptions and could characterise them as effective in terms of TQM (qualitative research).

These particular research methodologies were used to verify the assumption that effective schools display the characteristics of TQM (see par. 1.4): the quantitative research to determine the extent to which TQM is applied in schools, and the qualitative research to ascertain what TQM methods or strategies are used in schools as a supplement to the quantitative study. Both methodologies are of critical importance for the development of management strategies or guidelines for implementing TQM in schools.

5.2 QUANTITATIVE RESEARCH

5.2.1 The questionnaire as research instrument

The questionnaire was used in this research to get individual responses from schools with regard to their application of quality principles (Gall *et al.*, 1996:288).

The aims of the questionnaire were to

- Determine to *what extent* effective schools base their excellent performance on TQM practices;

- Determine to what extent *elements* of TQM can be identified in these schools, and
- Identify generic characteristics of these schools on the basis that they are typified as effective schools.

The use of the questionnaire in educational research can be very valuable if carefully planned and developed (Gall *et al.*, 1996; Mouton, 2001:99-108; Coleman & Briggs, 2002:159-171). In this research, a questionnaire survey was used for the following reasons (Smit, 1988:59-66; Gall *et al.*, 1996:289, Neuman, 1997:233):

- The sample schools are situated over a relatively remote geographical area. It was, therefore, more cost-effective to mail the questionnaires than to visit each school with the aim of interviewing, and
- The time factor also played a role in getting the completed questionnaires back from the sample schools.

The benefit of the questionnaire is that the same questions could be posed to the principals of all sample schools. Responses were in writing and respondents had the opportunity to respond to the questions without feeling intimidated.

Questionnaires, however, cannot probe deeply into respondents' opinions and feelings. Once the questionnaire is distributed, it is not possible to modify the items, even though some questions may be unclear to some respondents. In an interview situation, these limitations can be addressed more appropriately (Gall *et al.*, 1996:289).

5.2.2 Construction of the School Effectiveness Assessment Questionnaire (SEAQ)

The construction of the questionnaire was based on the structure and contents of the Baldrige Education Program (see 3.4.4), while the TQM elements identified in Chapter 2 to 4 have also been considered (see 2.10; 3.5; 4.9)

Two existing studies on quality improvement in education were also studied. Both studies are based on the *Malcolm Baldrige National Quality Program* in the USA. The Baldrige Award Program provides a comprehensive and systematic framework for assessing performance excellence. It is a set of interrelated, results-orientated requirements linked to organisational excellence defined through seven categories. The integrated framework provides for a school system with both a standard of performance excellence and a diagnostic system against which to assess itself (Horine *et al.*, 1998).

In the first study conducted by the Department of Professional Studies and the Department of Industrial Education and Technology at the Iowa State University, the aim was to assess the quality climate in Iowa's community colleges as perceived by the leadership of these colleges. The assessment instrument is based on the seven quality dimensions of Baldrige Award Program, i.e. leadership, information and analysis, strategic quality planning, human resource development and management, management of process quality, quality and operational results and customer services (Bax, 1996; Poston Jr., 1996).

A second study also uses the Baldrige categories as organising framework for assessing best practices and improvement opportunities of 30 school districts actively implementing continuous quality improvement principles. The Baldrige categories are leadership, human resource development and management, strategic and operational planning, information and analysis, educational and business process management, school performance results, learner focus and learner and stakeholder satisfaction (Horine *et al.*, 1998). Therefore it may be concluded that this instrument is valid and usable in an education setting.

As a quality assurance system (see 3.4.4), the Baldrige Program is in fact interrelated with TQM. This interrelatedness holds that the Baldrige Program and TQM share elements that are regarded as key characteristics of TQM (see 2.10; 3.5; 4.9).

The Baldrige Program, designed for use in the USA, was enacted into law in 1987 to recognise quality excellence and to stimulate quality improvement in the USA industry. The Program criteria are widely recognised throughout the international business community as a standard for performance excellence. In the years since 1995, the Baldrige Program has extended the assessment framework into education and health. The education criteria are a set of interrelated, results-orientated requirements linked to organisational excellence. This integrated framework provides a school system with both a standard of performance excellence and a diagnostic system (Horine *et al.*, 1998).

The Program, therefore, forms the basis for organisational self-assessment, for making awards, and for giving feedback to applicants. The criteria are designed to help organisations to use an aligned approach to organisational performance management that results in (NIST, 2001):

- Delivery of ever-improving value to learners and stakeholders, contributing to improved education quality;
- Improvement of overall organisational effectiveness and capabilities, and
- Organisational and personal learning.

The criteria for the Baldrige National Quality Award Program for educational institutions (2001) have been used as the organising framework for assessing the effectiveness of the management of secondary schools in the RSA. The Baldrige Program is built upon a set of interrelated core values (see 3.4.4.3), which are associated with high-performing organisations.

A questionnaire has been developed, based on the seven quality dimensions of the Baldrige Program. In developing the questionnaire, the education criteria of the Baldrige Program (2001) were studied (NIST, 2001).

The questionnaire was designed to assess to what extent elements of TQM are practised at selected effective secondary schools. Based on the notion that the effectiveness of schools is being assessed, the questionnaire is labelled the

School Effectiveness Assessment Questionnaire (SEAQ): The SEAQ contains 80 items with statements addressing the operations and policies of schools. Respondents were asked to consider and decide to what extent each item reflects the current situation at the school by using a Likert scale type (Gall *et al.*, 1996) of four possible responses (*no extent; slight extent; moderate extent; full extent*). Demographic items were also included (gender, age, years experience as principal, level of education and position) to aid possible statistical comparisons and analysis of groups (see Addendum C).

The questionnaire consists of the following sections:

Section A contains items that are aimed at collecting background and work-related information from the respondents. (see Section A, questions 1 – 5, Addendum C);

In Section B the items are aimed at determining *to what extent* the respondents regard organisational leadership, public responsibility and citizenship as relevant to school effectiveness (see Section B, questions 6 – 17, Addendum C);

Section C determines *to what extent* strategic planning, development and deployment reflect the effectiveness of the school (see Section C, questions 18 – 31, Addendum C);

The items in Section D establish *to what extent* knowledge of learner, stakeholder, and market needs, expectations, relationships and satisfaction indicates school effectiveness (see Section D, questions 32 – 46, Addendum C);

Section E determines *to what extent* measurement and analysis of organisational performance and information management contributes toward quality management (see Section E, questions 47 – 53, Addendum C);

In Section F the focus is on determining *to what extent* work systems, system and staff education, training, development, wellbeing and satisfaction are indicators of quality management at schools (see Section F, questions 54 – 65, Addendum C);

Section G examines *to what extent* the school's education design and instructional approaches, learner services, and support processes reflect the school's educational effectiveness (see Section G, questions 66 – 76, Addendum C), and

The items in Section H examine *to what extent* organisational performance results demonstrate the effectiveness of the school's educational programme (see Section H, questions 77 – 80 Addendum C).

The questionnaire was developed to gather data to determine to what extent the principals of effective secondary schools are using TQM principles to manage their schools. A four-point scale was used in Sections B, C, D, E, F, G and H to determine to what extent the principals of selected secondary schools adhere to particular criteria set for quality management. The scale provides for *no extent* (1), *slight extent* (2), *moderate extent* (3) and *full extent* (4). For the purposes of this research, all responses that exceed a mean score of 3.0 will be discussed, assuming that these items reflect the situation in the schools to a full extent. In addition, the responses between 2.0 and 2.99 will be discussed as reflecting the situation in the schools to a moderate extent.

5.2.3 Pilot study

The items used in the questionnaire are based on the education criteria that are set in the Baldrige National Quality Program. The criteria were developed within a USA framework and have been customised to the RSA context. The following actions were taken to determine the construct validity of the questionnaires in the RSA context:

- The survey items were reviewed by two experienced principals of schools and a superintendent of education in the North West Province, and
- The piloting of two secondary schools (n=2) in the North West Province to review the questionnaire.

The aims of the pilot study were to:

- Assure each item was appropriately placed within each of the seven criteria as defined in the Baldrige framework;

- Evaluate items for clarity and understanding, and
- Suggest new items where appropriate.

5.2.4 Finalisation of the questionnaire

Based on the recommendations of the examiner, the inputs of the superintendent and on the outcome of the pilot study, the instrument was revised and a final draft produced.

5.2.5 Study population and sample

The study involved secondary/combined schools (n=60) from all school districts in the North West Province of South Africa, which is a large rural area with a few urban communities. Schools were targeted with the assistance of the Education Management Information System (EMIS) in the North West Department of Education. The schools that were targeted had a learner pass rate of between 80% and 100% on average in the Grade 12 external examination during the years 1997 to 2000. School principals formed the specific population of the study, which was identified prior to the commencement of the study. Questionnaires were distributed with the assistance of district and circuit managers, to be completed by the principals of those schools.

The study population was stratified in terms of the number of registered grade 12 candidates for the year 2000 external examination, divided into four categories of schools (0 – 49 candidates; 50 – 99 candidates; 100 – 149 candidates; 150 + candidates).

5.2.6 Response rate

According to the literature (Landman, 1980:112; Ary *et al.*, 1990:453; De Vos *et al.*, 2002:172), a response rate of between 60% and 70% provides enough data to draw valid and reliable conclusions. Generalisations from the research can then be made to the whole study population.

Questionnaires totalling 60 in number were distributed to the identified schools and 40 (66,6%) were returned. This response rate is adequate to draw meaningful conclusions for the study population.

Table 5.1 Sample population

Schools identified	Questionnaires distributed	Questionnaires returned	Percentage (%) return
60	60	40	66,6

5.2.7 Statistical analysis

The Statistical Consultant Service of the Potchefstroomse Universiteit assisted with the processing of the returned surveys. In the processing of the data, the responses on all items were considered. The analysis comprised a frequency procedure (Section A) and a means procedure (Sections B to G). In Section A, frequencies and percentages of the responses to each item, as well as the cumulative frequencies and percentages are given. The responses to the items in Sections B to F are indicated as mean scores, ranked in descending order per section.

5.2.7 Administrative procedure

The permission of the North West Department of Education (Directorate: Co-ordination) was requested (see Addendum A) and obtained (see Addendum B) for mailing the questionnaire to the sample schools. The questionnaire was distributed to the principals of all targeted schools with the assistance of district and circuit managers. Principals of the sample schools were requested to complete the questionnaire and to return the completed forms by mail.

The accompanying directions for completing the surveys were self-explanatory. Instructions were printed on the front page of the questionnaire, including the postal address and due date for the return of the completed questionnaire. A glossary was printed on the reverse side of the questionnaire to explain terminology that might have been difficult to understand.

5.2.8 Data analysis

The analysis of the statistical data comprises a discussion on the responses of the principals as reflected by the mean scores. Each section was discussed according to the specific aims of the Baldrige education criteria. Section H (Organisational

performance results), however, was excluded from this analysis. The reason for the exclusion was that the items covered in this section had been discussed in other sections, subsequently any further discussions would have been redundant.

5.3 QUALITATIVE RESEARCH

5.3.1 The aims of the study

The approach with qualitative research is different from that of quantitative research. Norman Denzin and Yvonna Lincoln (Gall *et al.*, 1996:28) define qualitative research as follows:

“Qualitative is multimethod in its focus, involving an interpretive, naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them”.

In this study schools were the direct source of data and principals, educators, learners and parents were interviewed and observed in their natural setting (Bogdan & Biklen, 1982:27-30). The collected data was described and interpreted with the following aims:

- To establish whether the values and beliefs that define the school’s culture and direct people’s actions, are based on TQM assumptions (Carlson, 1996:74; Gall *et al.*, 1996:607, 613), and
- To identify particular characteristics of these schools which could characterise them as effective in terms of TQM.

The research method applied for the collection of data is the interview, which includes focus group and individual interviews.

5.3.2 Focus group interviews

5.3.2.1 Purpose of the interviews

The focus group discussion involves addressing questions to a group of individuals who were assembled for this specific purpose. The purpose of the discussion is as follows (Gall *et al.*, 1996:307):

- To obtain the perceptions of the participants on the effectiveness of the management of their schools. The interactions among the participants stimulate them to state feelings, perceptions and beliefs that they would not express if interviewed individually;
- Focus groups provide insight into the attitudes, perceptions and opinions of participants (Crick & Geddes, 1993:141; Coleman & Briggs, 2002:150);
- The focus group technique avoids putting the interviewer in a directive role. The interviewer asks questions to initiate discussion, but then allows participants to take major responsibility for stating their views and drawing out the views of others in the group;
- The discussion is relaxed, comfortable and often enjoyable for participants as they share their ideas and perceptions;
- To collect data within limited time (Leady & Olmrod, 2001:159), and
- To supplement data that was collected by means of questionnaires (quantitative research) (De Vos *et al.*, 2002:306)

5.3.2.2 Selection of a sample

Focus group interviews were conducted at six public schools (n=6) in the North West Province. The schools were selected on the basis that their Grade 12 learners achieved a 98-100% pass rate in external examinations sustained over a period of five years. In addition, the schools that were selected had in excess of 100 grade 12 candidates in the external examination of 2000.

The sample schools were drawn from urban and semi-urban areas in the North West Province.

5.3.2.3 Interview format

In qualitative studies, the interview format is either open-ended or semi-structured (Leedy & Olmrod, 2001:159). Semi-structured interviews were conducted in the form of a standardised open-ended interview, which involved a predetermined sequence and wording of the same set of questions to be asked of each respondent or group of respondents. This is done in order to minimise the possibility of bias (Bogdan & Biklen, 1982:71; Gall *et al.*, 1996:310).

The interviews were characterised by flexibility rather than rigor. Group dynamics are at the heart of the focus groups (Crick & Geddes, 1993:144). The interviews were conducted in a relaxed, non-threatening environment with groups of educators, learners and parents (approximately five people in each group). The principals were interviewed individually.

In the literature, it is suggested that the length of interviews be limited, bearing in mind the amount of work involved in transcribing the records (Bogdan & Biklen, 1982:95-96). The length of group and individual interviews was therefore limited to 30 minutes per group.

5.3.2.4 Development of interview items

The items were based on the seven dimensions of the Malcolm Baldrige education criteria for performance excellence and other key TQM concepts from the literature. The seven dimensions were approached as the main topics for discussion, while a number of items were listed under each topic. Those items were converted into questions during the interviews. All topics were discussed with the respective respondent groups and principals. The topics and items were structured to form an interview schedule (see Addendum D):

1. Organisational profile

- Competitive environment
- Excellence
- Challenges

2. Leadership

- Role of leadership – commitment/role models
- Visible involvement
- Quality values and vision
- Review role/early detection of faults
- Empowerment
- Impact on society

3. Strategic planning

- Academic standards
- Future orientation
- Continuous improvement
- Communicating objectives
- Team work – quality improvement
- Learner centredness – individual needs

4. Learner, stakeholder and market focus

- Relationships with customers
- Focus on active learning skills
- Handling of grievances
- Participation
- Customer satisfaction – surveys and feedback
- Comparison with other organisations/schools

5. Information and analysis

- Decision making
- Monitoring/measuring
- Communicating of information

6. Systems and staff focus

- Work systems aimed at excellence
- Healthy work environment
- Motivation and recognition
- Staff satisfaction

- Training and building of staff skills and personal learning

7. Process management

- Aimed at academic success
- Continuous evaluation
- Self assessment
- Teaching methods
- New technology
- Networking.

5.3.2.5 Pre-testing of the interview

The interview was pre-tested at one secondary school with the following aims (Gall *et al.*, 1996:317):

- To determine possible communication problems and whether items/questions should be rephrased, and
- To identify items/questions that were ambiguous and, therefore, subject to different interpretations by different respondents.

The interview schedule was adjusted after the completion of the interviews with the principal, educators and learners at the school.

5.3.2.6 Conducting of interviews

The interviews were conducted in the form of separate focus group discussions for educators, learners and parents. It was important to establish rapport and to gain the trust of the respondents. All participants were involved in the discussions since depth is the most important characteristic of focus group interviews (Crick & Geddes, 1993:141). The interviews involved asking questions, listening, expressing interest and recording what was said (Neuman, 1997:371).

All interviews were conducted in the language of instruction of the selected schools, which were either Afrikaans or English (Gall *et al.*, 1996:319).

Individual interviews were conducted with the following individuals and groups:

- School A: principal, educators and learners;
- School B: principal, educators, learners, and parents;
- School C: principal, educators, learners and parents;
- School D: principal, educators and learners;
- School E: principal, educators, learners and parents, and
- School F: principal, educators and learners.

The principals and groups of educators and learners were interviewed. In Schools A, D and F it was not possible to get the parents together for interviews.

5.3.2.7 Recording of interview data

Note taking and tape recording are the usual methods used to preserve the information collected in the interviews. A disadvantage of note taking is that it might disrupt the effectiveness of the communication between interviewer and respondent.

The use of tape recorders has several advantages over note taking for recording interview data for research. Tape recording provides a complete verbal record and it can be studied more thoroughly than data in the form of interviewer notes. A tape recorder also speeds up the interview process because there is no need for extensive note taking. The main disadvantage of tape recording an interview is that the presence of the tape recorder might cause the respondents to be reluctant to express their feelings freely. The interviewer, therefore, needs to explain the purpose of the recording carefully and gain the confidence of the respondent, so as to minimise any undesirable effects of having the interview recorded (Gall *et al.*, 1996:320).

The responses of all individual and group interviews were recorded during the interviews. Due to technical problems, the record of the interview with the educators of School E was lost and, therefore, not taken into account for the analysis. Thereafter, the responses of each principal and group were transcribed verbatim and all transcripts of 5 of the respondent schools were translated into English.

The essence of the responses on the open-ended questions was captured in condensed tables (Gay & Airasian, 2000:221).

5.3.2.8 Data analysis

The transcripts of the interviews were interpreted according to the aims of each category of the Baldrige education criteria (see 6.2).

5.4 CONCLUSION

In this chapter the research design for the quantitative and qualitative research was presented. In the quantitative research, a questionnaire was developed to collect data from the sample population. A pilot study was undertaken to pre-test and finalise the questionnaire. The questionnaires were distributed to the study population and the completed questionnaires were analysed statistically.

The qualitative phase of the research comprises focus group and individual interviews with a selected study population. The interviews were recorded and the data transcribed and structured in preparation of the data analysis.

In the next chapter the research data will be analysed and interpreted.