CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Educational reforms in Oman have ushered major changes in the leadership and management of schools, curriculum content, organizational structure of schools, and assessment of teachers' performance and students' learning. These changes have posed many challenges and demands on principals, teachers, and students. In this context, principals particularly have to upgrade their knowledge, competencies, and dispositions in order to carry out effectively their new roles and functions, and thus training and development programs are deemed imperative for their success and effectiveness. However, as mentioned before, any training and development program must begin with training needs analysis. Accordingly then, the purpose of this study was to analyze and identify various professional development needs and leadership challenges of school principals in Muscat, Oman. The needs and challenges pertain to school management and leadership were as elaborated in the conceptual framework of Chapter One previously. Salazar's (2002) model of needs analysis becomes the foundation of the conceptual framework for this study as it is very relevant for designing professional development programs for school principals in Oman. Such a model has never been used before for organizing systematically principalship training in Oman.

As a matter of recalling, the objectives of the study were as follows:

1. To analyze and identify the important domains of professional development needs for school principals of Oman in the context of educational reform.
2. To examine the elements or practices in instructional leadership and transformational leadership domains or factors among school principals in Muscat in the context of educational reforms in Oman.
3. To analyze and categorize the challenges faced by school principals in their professional development in the context of educational reforms in Muscat, Oman.
4. To draw up a list of recommendations regarding school improvement and school principals development in the context of educational reforms in Muscat, Oman.

Correspondingly, this study attempted to answer the following questions.

1. In the context of educational reform in Oman, what are the major professional development needs among school principals particularly in Muscat?

2. In the context of reform, what are the specific needs perceived by school principals to be of high importance for instructional leadership and transformational leadership of school principals in Muscat?

3. What is the extent of correlations among the identified domains or factors of professional development needs of school principals in Muscat?

4. What are the abilities of instructional leadership and transformational leadership of some school principals in Muscat, Oman?

5. What are the major challenges facing school principals in Muscat in their professional development within the context of educational reforms in Oman?

6. What are the recommendations for school improvement and principals' professional development by school principals in Muscat within the context of educational reforms in Oman?

3.2 Overall Design of the Study

Based on the objectives and research questions, this study comprised two parts, namely the survey part and the observation-interview part to collect data both the quantitative and qualitative ways. The survey part dealt with research questions 1 and 2, while the observation-interview part pertained to research questions 3 and 4.

Table 3.1 and Figure 3.1 in next two ensuing pages summarizes the research design and corresponding connections among research objectives, research questions, research methods, and data analysis.

Table 3.1 Summary of Research Objective, Question, Methods and Analysis

Research Objective	Research Question	Research Methods	Data Analysis
1. To analyze and identify the core professional development needs for school principals of Oman in the context of educational reforms in Muscat, Oman.	1. What are the important domains of professional development needs for school principals in the context of educational reforms in Muscat, Oman?	* Questionnaire on professional development needs	**Statistics:** Reliability analysis, Factorial analysis, Frequency percentage, Means comparison
2. To examine the elements or practices of instructional leadership and transformational leadership domains or factors of school principals in Muscat in the context of educational reforms in Oman.	2. In the context of reform, what are the specific needs perceived by school principals to be of high importance for instructional leadership and transformational leadership of school principals in Muscat? 3. What is the extent of correlations among the identified domains or factors of professional development needs of school principals in Muscat?	* Adapt Pamela's (2001) and Salazar's (2002) questionnaire on professional development needs--classify instructional and transformational leadership	**Statistics:** Factor Analysis, mean comparison, correlation matrix.
3 .To analyze and categorize the challenges faced by school principals in their professional development in the context of educational reforms in Oman.	4. What are the abilities of instructional leadership and transformational leadership of some school principals in Muscat, Oman? 5. What are the major challenges faced by school principals in their professional development in the context of educational reforms in Oman?	* Visitations to schools and Interview protocols on educational reforms, challenges, and professional development needs	**Analysis of interview data using codes, concepts, categories, and themes (Miles & Hubermann, 1994)**
4. To draw up a list of recommendations regarding school improvement and school principals development in the context of educational reforms in Muscat, Oman.	6. What are the suggestions or recommendations made by school principals for improving schools and their own professional development in the context of educational reforms in Muscat, Oman?	* Visitations to schools and Interview protocol about challenges and issues	**Analysis of interview data using codes, concepts, categories, and themes**

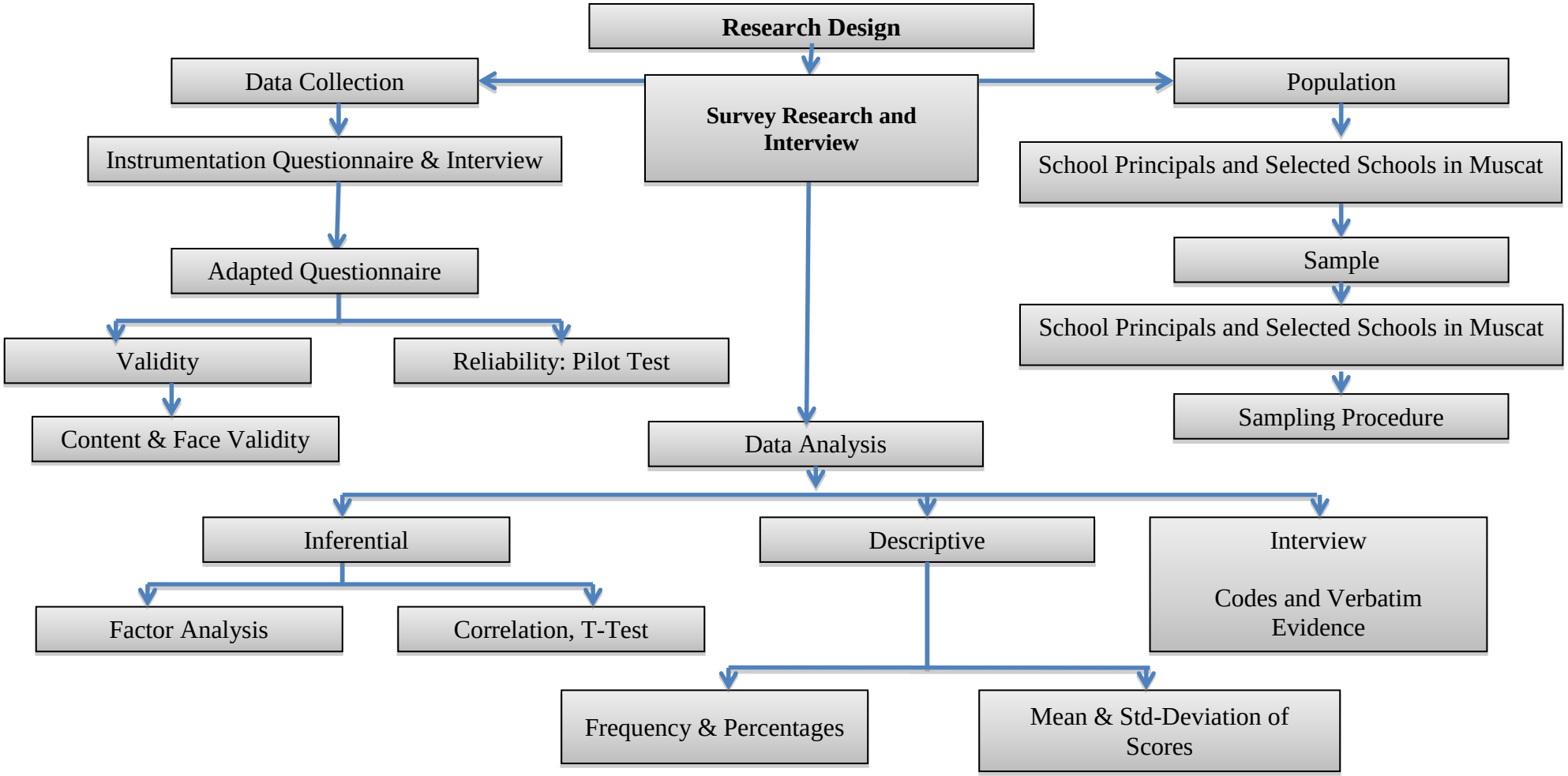

Figure 3.1: Overall Research Design and Analysis Structure

3.3 Research Instrument

The research instrument refers to the survey questionnaire and the observation-interview protocol used to collect data pertinent to answer the research questions. Thus, this research used both the quantitative and qualitative methods for collecting data. Researchers who normally use logical positivism and quantitative research, according to Nahid, 2003, employ surveys and tests to analyze hypothetical generalizations (Hoepfl, 1997). Additionally, they emphasize the measurement and analysis of causal relationships between variables (Denzin and Lincoln, 1998).

In addition, quantitative research enables the researcher to familiarize him or herself with the problem or concept to be studied and perhaps generate hypotheses to be tested. In this paradigm: (1) the emphasis is on the facts and causes of behavior (Bogdan and Biklen, 1998), (2) information presented in the form of numbers that can be quantified and summarized, (3) the process is the standard mathematical analysis of numerical data and (4) the final result is expressed in statistical terminology (Charles, 1995 cited by Nahid, 2003).

3.3.1 Survey Questionnaire

The survey questionnaire was developed, verified, and used in Salazar's study (2002) on *The Professional Development Needs of High School Principals for School Improvement.* Salazar however conceptualized a model of the arrangement of the domains on professional development needs as portrayed in Chapter One, Section 1.3 of this thesis. This study translated the survey instrument into the Arabic version, then pilot-tested it, and later used it to conduct a survey in Muscat, Oman.

Salazar's model seemed to be very suitable for organizing professional development training of school principals in Oman, which had never used any systematic model in professional training of school principals before. However, based on the review of literature in Chapter Two before, the domains in Salazar's model can be rearranged and categorized into two major areas of school leadership, namely instructional leadership and transformational leadership. As argued before, instructional leadership (IL) pertains to the core business of instruction, learning, and school performance, whereas transformational leadership (TL) relates to bring new changes and innovations for the purpose of school improvement and development (Sufean, 2014; McEwan, 2002). Therefore, the domains in Salazar's model were rearranged and categorized accordingly as follows—as also indicated in Table 4.20, page 171 in Chapter Four later:

i. Designing, implementing, and evaluating curriculum (IL)
ii. Understanding measurement, evaluation, and assessment strategies (IL)
iii. Creating school as a learning organization—for improving school effectiveness (IL)
iv. Understanding students' development and learning (IL)
v. Building team commitment based on beliefs and values (TL)
vi. Team work skills (TL)
vii. Problem solving for improving teaching and learning (IL)
viii. Building shared decision-making in curriculum delivery (IL)
ix. Research knowledge skills related to teaching and learning (IL)
x. ICT utilization in teaching and learning (IL)
xi. Defining the core values and beliefs of education (TL)
xii. Communicating effectively (TL)

xiii. Setting goals and determining outcomes (IL)

xiv. Building community involvement (TL)

xv. Resolving conflicts (Building consensus and negotiating leadership capacity)—(TL)

1. Designing and implementing and evaluating curriculum

The teaching and learning content and structure in schools are mainly determined by the curriculum developed by the Ministry of Education of Oman. However, school principals and heads of departments are allowed to use their creativity and innovative capacity to modify the syllabus of all subjects in order to make the syllabi relevant to the different localities, which have different environment and cultural settings. In this regard, the principals have to demonstrate their instructional leadership capacity to modify the curriculum. Examples of the survey items included in this domain are:

- *Professional development activities for principals should include more programs about curriculum designing, implementing and evaluation*
- *Professional development activities should include more programs about optimizing the use of different learning resources to enrich the curriculum*
- *School principals need more skills in how to participate in the process of designing, implementing and evaluating curriculum*
- *School principals as instructional leaders need more knowledge in designing, implementing and evaluating curriculum.*

2. Measurement, Evaluation and Assessment strategies

This factor explains the implementation of a comprehensive plan to raise students' achievement, continuous evaluation of school performance, feedback from programs,

using evaluation to increase school performance and employing different assessment and evaluation methods. This domain was measured by the following survey items:

- *School principals should be trained in how to implement a comprehensive plan to raise students' achievement.*
- *School principals should be given more programs in how to implement continuous evaluation of school performance.*
- *School principals should be receive more programs about varying assessment and evaluation methods.*
- *As a school principal I need professional development programs on how to apply the measurement, evaluation and assessment strategies in school performance.*

3. Creating a learning organization

This domain pertains to encouraging teachers to improve their teaching methods using different teaching aids, encouraging teachers to be knowledge seekers using different educational resources and encouraging teachers to conduct research to improve school performance. Additionally, it is about participating in different activities about professional development and supporting teachers with new ideas and teaching methods to enhance students' achievement. The following survey items portray this domain.

- *School principals should be more knowledgeable in how to encourage teachers to improve their teaching methods using different teaching aids.*
- *School principals should be more knowledgeable in how to encourage teachers to be knowledge seekers using different educational resources.*
- *School principals should receive training programs in how to encourage teachers to conduct research to improve school performance.*

- *School principals should be trained in how to be active participators in different activities about professional development.*

4 Understanding student's development and learning

This construct elucidates reviewing student's achievement with teachers, about principals implementing a clear shared mission focusing on student achievement, designing programs which aim to develop a student's personality and supporting students with positive values and belief. This domain included the following items:

- *School principals should be receive more programs in how to support teacher with new ideas and teaching methods to enhance student achievement*
- *School principals need more skills in how to investigate and analyze student achievement*
- *School principals need more skills in how to investigate and analyze school performance*
- *School principals need more skills about new attitudes in students' development*
- *The principals should be trained in how to implement a clear shared mission focusing on students' achievement*

5 Building team commitment

This domain relates to building productive relationships and creating a culture of team working among teachers and students, encouraging senior teachers to implement a plan for classroom visits among teachers, taking on board teacher and student suggestions in school development and providing teachers with continuous feedback about their performance. The following items were used to investigate this domain:

- *School principals should be supported with more programs about building productive relationships and creating a culture of team commitment among teachers and students.*

- *School principals should be knowledgeable in how to pursue the efficient use of common educational resources in the school*
- *School principals should be trained in how to respect teacher and student suggestions in school development*
- *School principals should receive more training programs in how to provide teachers with continuous feedback about their performance.*

6 Team work Skills

This domain has items concerning the maintenance of positive interpersonal relationships with teachers and students, assisting teachers in improving classroom instruction; provide emotional support to teachers and students and creating an environment that supports teachers' and students' autonomy as well as participating with other school principals in different educational functions. These items were:

- *School principals need more skills in how to maintain positive interpersonal*
- *relationship with teachers and students*
- *School principals should be trained in how to promote a climate of team working and harmony in school environment*
- *School principals should receive training programs in how to share information and support teachers and students*
- *As a school principal I need training in different methods of team working skills*

7 Problem solving

This domain pertains to resolving complex problems, developing and implementing a strategic action plan for problem solving and using scientific methods in problem solving as well as implementing multi-solutions during to solve problems. The following items are related to this dimension:

- *School principals need more professional development programs in resolving complex problems related to their work*
- *School principals need more skills in how to develop and implement strategic action plan for problem solving*
- *School principals need more professional development programs in how to implement multi solutions for each problem.*
- *School principals need training programs in how to and investigate and classify work environment problems*

8 Building shared decision making

This domain relates to principals acting as decision makers, involving teachers in decision-making process and acquiring skills about decision-making. The items for this domain were:

- *School principals need more training programs to act as a decision maker*
- *School principals need more training in how to involve teachers and students in decision making*
- *School principals need more skills in how to implement active decisions to each problem*
- *School principals need more skills in how to follow the scientific procedures before making my decision.*

9 Research knowledge skills

This domain is about professional development activities for school principals such as training programs about educational research skills and about school principals becoming instructional leaders in order to do action research in their schools as well as attending workshops about research knowledge skills. The following questionnaire items are related to this domain:

- *Professional development activities for school principals should include more training programs about educational research*

- *School principals as instructional leaders should be trained in how to implement action research in their work environment*
- *School principals need to attend more workshops about different types of educational research*
- *School principals need more professional development programs about the importance of educational research in school performance*

10. ICT Utilization in Teaching and Learning

This domain pertains to the use of computers and internet in the process of teaching and learning. The items in this domain are

- *School principals need more training strategies related to ICT utilization*
- *School principals need professional development programs in how to help teachers in ICT utilization*
- *School principals need more training about the importance of ICT utilization in school improvement*
- *School principals need more opportunities to work with colleagues to become more proficient using ICT*

11. Defining core values and beliefs of education

School principals should be able to create a positive school climate through educational values and beliefs, should be able to create an effective communication relationship among teacher and students and possess skills to be able to communicate effectively. The questionnaire items related to this domain are:

- *School principals should attend workshops on defining a school vision and mission for educational reforms*
- *School principals must be trained in how to emphasize the core values and beliefs of education and how to implement it in schools for holistic human development*

- *School principals should be trained how to ensure that teachers provide quality instruction*
- *School principals need more training in how to ensure that students have quality learning facilities and opportunities*
- *School principals should be trained in how to manage a safe and conducive school environment.*

12. Communicating effectively

Communication skills are very important in any organization and it is so important for schools and the school principal should be able to communicate in various ways. School principals as education leaders should be able to communicate in the internal school environment and also to the external community. For internal communication they should create an active communication process with teaches, students and all the other staff in the school and for external communication they should be able to communicate very well with other school principals, parents of the students and all the community members.

The following items are related to this dimension:

- *School principals should receive more professional development programs in how to create effective communication relationships among teachers and students*
- *School principals need more skills about building a positive communication with other school principals*
- *School principals need more skills to be able to communicate effectively with the parents of the students*
- *School principals as transformational leaders need professional development programs about the scientific approaches in communication process.*

13. Setting goals and determining outcomes

This explains the importance of implementing the vision and the mission of the school, about establishing strategies for continuous improvement of the school and

establishing a positive school culture. The questionnaire items related to this dimension are:

- *School principals need professional development programs about implementing the vision and the mission of the school*
- *School principals need more skills in establishing strategies for continuous improvement of the school and need more skills in establishing a positive school*
- *School principals need more training programs in how to establish a positive school culture*

14. Building Community Involvement

This factors illustrates the importance of providing opportunities for teachers to enhance their teaching and learning skills, establishing positive human relationship in school; guiding teachers to investigate their weaknesses and help then to overcome them, and about working to clarify the objectives and plans of the school community as well as encouraging parents to visit schools and to talk with teachers about student achievement. The questionnaire items in this dimension are:

- *School principals need more skills in how to provide opportunities for teachers to enhance their teaching and learning skills*
- *School principals need more training programs in how to establish positive human relationships in school*
- *School principals need more training in how to guide teachers to investigate their weaknesses and help them to overcome their weakness*
- *School principals need more professional development programs in how to clarify the objectives and plans of the school community*
- *School principals need more skills in how to encourage parents to visit schools to talk with teachers about student achievement*

15. Resolving Conflicts (Building consensus and negotiating effectively*)*

Every organization has its own conflicts, and in schools various types of conflict occur and school principals should be able to deal with those conflicts in different ways. School principals as transformational leaders should gain the knowledge, skills and attitudes which make them able to create positive results and overcome the conflicts which happen in the school as a learning organization. The items in this dimension are:

- *School principals need professional development programs to enhance their skills regarding work conflicts*
- *School principals need more skills in how to transform the conflicts to be positive actions*
- *School principals need more negotiation skills to be able to deal with different types of conflicts in the school*
- *School principals need more skills in how to overcome the negative work conflicts*

3.3.2 Ordinal Scale for the Survey Items

All items in the survey questionnaire had an ordinal scale, i.e. four-point ordinal scale rated as:

1- Not Important

2- Fairly important

3- Important

4- Very Important

The survey questionnaire was translated from English to Arabic by a professor in the language faculty at the Sultan Qaboos University, Oman, and it was re-translated back to Arabic to verify its linguistic compatibility.

3.4 Pilot Study

The Arabic version of the survey questionnaire was then pilot tested with some principals in a district outside Muscat. A pilot study was conducted to test the instrument for face, content and construct validity –in particular, to check that the questions drew forth appropriate responses by consulting some lecturers on the similar field (Beanland, Schneider, LoBionda-Wood, & Haber, 1999). Minor editing was done to the survey questionnaire to improve its accuracy, and later it was used for the actual data collection in the district of Muscat city.

In general, a pilot or feasibility study is a small experiment designed to test logistics and gather information prior to a larger study, in order to improve the latter's quality and efficiency. Moreover, a pilot study can reveal deficiencies in the design of a proposed experiment or procedure and these can then be addressed before time and resources are expended on large scale studies. A pilot study is usually small when compared with the main research and therefore can provide only limited information on the sources and size of variation of response measures (NC3Rs, 2006).

Additionally, the aim of the pilot study was to establish the reliability of the instrument. Mostly, "in quantitative studies and pre-testing, a pilot study is needed either to try out the instrument or to supply the findings for the actual study" (Kerlinger, 1992, p.648). In this study, to conduct the pilot study, 20 principals were

selected from different schools in outside Muscat city in Oman and the data obtained from them was used to test the reliability of the instruments using Cronbach's alpha level of the items.

3.4.1 The Validity and Reliability of the Survey Instrument

Validity and reliability are important aspects of a quantitative research inquiry. Validity means that the individual's scores from an instrument make sense, are meaningful, and enable the researcher to draw good conclusions from the sample in a population. Validity refers to the degree in which the measuring device is truly measuring what it intends to measure. Joppe (2000) provides the following explanation of what validity is in quantitative research:

> Validity determines whether the research truly measures that which it was intended to measure or how truthful the research results are. In other words, does the research instrument allow you to hit "the bull's eye" of your research object? Researchers generally determine validity by asking a series of questions, and will often look for the answers in the research of others. (p. 1).

The survey instrument for this study had theoretical and construct validity because it fulfilled the conceptual framework used in this study, and it had been used by previous researchers such Pamela (2001) and Salazar (2002). To ensure the validity of the translation of the instrument from English to Arabic, the Arabic version was sent to experts in the field of Arabic language. This helps to establish content validity whereby the experts look into the content of translation, sentences, words; grammar and vocabulary to see if they are similar to the original English version.

Reliability means that scores from an instrument are stable and consistent (Creswell, 2008, p.169). The reliability of the instrument reported here was based on the data collected from the pilot study. Reliability is synonymous with the consistency of a test, survey, observation, or other measuring device. Joppe (2000) defines reliability as:

> The extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable. (p. 1).

In this respect, 'estimates of internal consistency' (Cronbach's alpha) was obtained as it is the most appropriate way of establishing reliability (Gay, 1992). A general rule was that indicators should have a Cronbach's alpha of 0.7 or more. In the case where low Cronbach's alpha value is found, some of the dimensions were also reworded.—[see pages 143-146, Chapter Four about validity and reliability of instrument]

3.5 Population

The population of the study consisted of all basic education schools in Muscat city, the capital of Oman. In social sciences, researchers rarely survey the entire population for two reasons (Adèr, Mellenbergh, & Hand, 2008): the cost is too high, and the population is dynamic in that the individuals making up the population may change over time. The three main advantages of sampling are that the cost is lower, data collection is faster, and since the data set is smaller it is possible to ensure homogeneity and to improve the accuracy and quality of the data.

In this study, the total number of schools and principals was estimated. Data from the Ministry shows that there are 128 Basic Education Schools in Muscat in Oman according to Omani's Education Statistics Year Book (2007/2008). Muscat is one of the states in Oman that has the highest number of schools.

\3.6 Sampling

Sample Size

In this study, the sample for the survey part was 80 school principals selected from the total population of 128 principals in Muscat. For sufficiency and good generalizability, the 80 school principals were chosen purposively from Cycles 1 and 2 in the new basic education system, and they represented the five zones of Muscat—north, south, center, east, and west zones. Subsequently, the survey questionnaire was be given to them.

In social science it has been stated that 10% of the population is adequate for research. Gay (1992) suggested that for descriptive research, a sample size of approximately 10% of the population is adequate. The size of the sample required depends on the nature of the population, the purpose of the study, and the resources available. However, the heterogeneity of the target population is very important in deciding a sample size. "The greater the heterogeneity, the larger the sample required to represent the population" (Ck & Bahrstanhadwic, 1984, p. 67). Also as the sample size increases, the standard error decreases (Babbie, 2001, cited by Amzat, 2005).

The determination of sample size is a common task for many organizational researchers. Thus, inappropriate, inadequate, or excessive sample sizes continue to

influence the quality and accuracy of research. Sample size is one of the four inter-related features of a study design that can influence the detection of significant differences, relationships or interactions (Peers, 1996).

For the quantitative part of the study, six principals were also chosen purposively from Cycle 1 and 2 schools in Muscat, and they were interviewed about their views on what things were needed for a school's development in the context of educational reform in Oman. The criteria which the researcher followed in choosing the interviewed principals was experience, i.e. 3 school principals who have an experience of less than 5 years and 3 principals who have more than 5 years or more experience. The researcher asked their opinions about the types of training needed and types of skills as well as knowledge that they should acquire in facing the challenges. Additionally, questionnaires were distributed to the principals, asking their opinion on the core professional development needs.

3.7 Data Analysis for the Survey Part

The survey data from all respondents were processed using the SPSS computer program (Statistical Package for the Social Sciences) version 18. Data were in the form of ordinal scale. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used for analyzing each item and group of items (group factor). Results were tabulated and interpreted as in Chapter Four later.

Allison (1999) suggests that all data be initially screened by the SPSS to check on missing values, outliers, univariate and multivariate normality, linearity and

homoscedasticity (homogeneity of variances and covariances). For an individual case, missing data under 10 % can generally be ignored, except when the missing data occurs in a specific nonrandom fashion (Hair, et al., 2010). If significant skewness and kurtosis values are found showing non-normal distribution, then transformation or deletion of outliers will be considered.

Exploratory factor analysis (EFA) will be used to assess construct validity of the instrument. In order to determine the number of factors, both the Kaiser eigen value criterion and the scree plot were consulted. Following the EFA, reliability analyses will be conducted for each dimension to determine the internal consistency of test items. The number of factors and coefficient alpha will be reported for all scales. Exploratory factor analysis (EFA) was also used to determine and group survey items according the appropriate domains. Basically, the EFA was employed in this study as it plays a critical role in developing and refining instrument scale as well as to empirically established factor structures as indicated by previous studies. The EFA was performed was performed on all items for each respective domain using principal-component analysis, with varimax rotation. The Principal Component Analysis (PCA) was selected as the factor extraction model to purely condense the variables by their necessary attributes without interpreting the resulting variables in terms of latent constructs (Conway & Huffcutt, 2003).

Reliability for the 15 domains was also assessed. According to Hair et al. (2010), the use of reliability measures such as Cronbach's alpha, did not ensure unidimensionality. There is no standard approach to assessing unidimensionality of the items for each of the domain assessed (Lai, Crane, & Cella, 2006) though several criteria are available to researchers. However, given the choice and sometimes

confusing nature of factor analysis, no single criteria should be assumed to determine factor extraction.

In this study, in addition to traditionally used Cronbach's α of greater ≥ .6 and inter-correlations ≥ .3 (Lai, et al., 2006), the selection of items were also based upon the following criteria:, (1) K1 rule (i.e number of factors with eigen value > 1), (2) factor loading ≥ .5, and (3) Average Variance Explained ≥ 50%. According to Hair (2010), average variance extracted (AVE) of .5 or higher is a good rule of thumb suggesting adequate convergence. An AVE less than .5 indicates that, on average, there is more error in the items than variance explained by the latent factor structure imposed on the measure. In fact, in social sciences, it is not uncommon to consider a solution that accounts up to 60 % of the total variation (Hair et al., 2010).

3.8 Qualitative Data Collection

Qualitative data analysis was employed to make sense out of the rich qualitative data and it involved consolidating, reducing and interpreting what the participants had said and what the researcher had observed and comprehended. The main goals were to reveal important themes and extent of emphasis that underlie participants' views on the topic under study and compare these themes across different types of groups. The ultimate aim was to form answers to the research questions. Even though there are many guidelines proposed by qualitative researchers, (Merriam, 2001; Miles & Huberman, 1994) but there is not a single, acceptable approach to analyzing qualitative data (Gay *et al*., 2006; Creswell, 2008).

Interview Method

Moreover, interviews are particularly useful for getting the story behind a participant's experiences. The interviewer can pursue in-depth information around the topic. Interviews may be useful as follow-up to certain respondents to questionnaires, e.g., to further investigate their responses (McNamara, 1999). In this regard, in this study, an interview was used as a supplement to the survey and the questions were written by following the interview protocol (as listed in Appendix B).

The areas of focus in interview sessions to answer research questions 3 and 4 were:

- Relationship of the principal's professional development and educational reform in Oman
- The importance of the principal's professional development programs
- Professional qualities of "excellent" school principals.
- Challenges related to professional development needs of school principals
- Educational management skills
- Leadership and supervision
- ICT utilization
- Research skills
- Communication barriers and English language ability
- Ministry strategy of enhancing principals professional development

In this study, interview sessions were conducted with six selected school principals in Muscat city—three boy-schools and three girl-schools. Interviews would reveal what types of professional development programs were important for school principals and what contributed to the making of an "excellent school principal". Additionally, the interviews would reveal the biggest challenges related to professional development needs of school principals in Oman.

In terms of management skills, the interview investigated the areas school principals in educational management feel they were less knowledgeable about, as well as determining the most important management and leadership areas that they need to improve in order to be an effective school principal. Hence, it looked into the professional development programs that the principals attended about ICT utilization in school management as well as the biggest challenges that school principals facing about Internet and ICT utilization in their schools.

Finally, the interview sought the school principals' opinions about how they can develop their skills and abilities in educational research and their fluency in English. In addition, it examined the most important strategies that the Ministry of Education follows to meet the professional development needs of school principals and their personal suggestions about how to improve professional development for school principals in Oman generally and in Muscat particularly.

According to Nahid (2003), interviews as a qualitative research uses a naturalistic approach that seeks to understand phenomena in context-specific situations, such as the "real world setting [where] the researcher does not attempt to

manipulate the phenomenon of interest" (Patton, 2001, p. 39). Qualitative research, broadly defined, means "not any kind of research that produces findings arrived at by statistical procedures or other means of quantification" (Strauss & Corbin, 1990, p. 17) and instead, the kind of research that “reached beyond the real-world settings, where the phenomenon of interest unfold naturally" (Patton, 2001, p. 39).

The qualitative results of analysis is a different type of knowledge than quantitative research, because one of the parties argue from the nature of each underlying philosophical paradigm, enjoying depth interviews and the other centers on the apparent compatibility of methods research "enjoying the rewards both in numbers and words" (Glesner and Peshkin, 1992, p. 8, Nahid, 2003).

Therefore, a qualitative researcher must be present for the changes to the registration of an event before and after the change occurs. Nevertheless, qualitative and quantitative researchers are to test and prove that their studies are credible. While the credibility of quantitative research relies on the construction of instruments, in qualitative research, the investigator or researcher is the instrument "(Patton, 2001, p. 14, cited by Nahid, 2003).

The qualitative research interview seeks to describe and the meanings of central themes in the life of the subjects. The main task in interviewing is to understand the meaning of what the interviewees say. (Kvale, 1996). Thus, it seeks to cover both a factual and a meaning level, though it is usually more difficult to interview on a meaning level. (Kvale, 1996).

Observation

Data were also collected using observations. Creswell (2008) defines observation as the "process of gathering open-ended, firsthand information by observing people and places at a research site" (p. 221). The observations in this study happened in the natural field setting and very often, observation intertwines with informal interviews and conversations. By observation, the researcher as an outsider, was able to see things that may lead to further understanding of the context but may have become routine and mundane to the participants themselves. Not everything could be observed. The researcher carried out observations by following Patton's (1990) suggestion on elements to note during an observation. They include the physical setting; the participants; the activities and interactions; the conversation; subtle factors such as informal activities and nonverbal communication; and the observer's behavior. Field notes were taken during observations in this study, which included photographs, memos, brief notes taken in the field, and detailed notes written away from the field as listed by Neuman (2006).

In this study, the researcher took on the role of observer as participant. In this qualitative research, a participant interpreted experiences within his or her social context subjectively. Hence, high-quality data collected during this study were able to capture such processes and provide an understanding of the participant's viewpoint. According to Neuman (2006), "a field researcher does not eliminate subjective views to get quality data; rather, quality data include his or her subjective responses and experiences" (2006, p. 404) from the researcher's immersion in the social context under study.

3.9 Validity and Reliability of Qualitative Data Analysis

Creswell defines validity of findings as "that the researcher determines the accuracy or credibility of the findings through strategies such as member checking or triangulation" (2008, p. 266). Lincoln and Guba (1985) use the terms *authenticity* and *trustworthiness* instead of accuracy and credibility. Validity indicates if the instrument actually measures what it purports to measure (Hanbury, 2007). The interpretation of the researcher on the finding is subjective. However, by engaging in self-reflexivity, the researcher constantly investigates herself while investigating others (Berg and Smith, 1998). Throughout the data collection and analysis processes, the trustworthiness of the findings and interpretations were maintained.

Four procedures were adhered to in this study to enhance the validity and reliability of findings. They were triangulation, member checks, peer examinations, and audit trail. Each validation procedure is described in the following section.

(1) Triangulation

Triangulation refers to collecting information from a diverse range of individuals, sites and sources of data, using multiple investigators or methods (Merriam, 2001; Newman & Benz, 1998). The works of Creswell and Plano Clark (2007), Greene *et al*., (1989), Morgan (1998), and Tashakkori and Teddlie (1998), reveal that the use of both qualitative and quantitative data that have advanced in the literature. The general feeling is that with more sources of information, the more likely one can get a complete perception of the phenomenon (Newman & Benz, 1998) besides strengthening the study's usefulness for other settings (Marshall & Rossman, 1995).

In addition to the inter-checking of the various data obtained, the multiple data sources give a holistic, multidimensional view of the phenomenon. Furthermore, triangulated data could show convergence, inconsistency, and complementary results.

In justifying the use of both qualitative and quantitative approaches, Creswell defends that "the quantitative provides the opportunity to gather data from a large number of people and generalized results, whereas qualitative permits an in-depth exploration of a few individuals" (2008, p. 562). According to Creswell (2003), most researchers recognize that limitations exist in all methods, and biases inherent in any single method could be neutralized. Jick (1979) substantiates that the use of both types of data helps in triangulating data sources.

(2) Member Check

Member refers to the participants being studied. Member check refers to systematically soliciting feedback about the research data and conclusions for the participants. In this study, member checks helped to rule out the possibility of misinterpreting the meaning of what participants say or do. This process was carried out continuously as mentioned by Merriam (2001) and Newman & Benz (1998). The researcher verified and confirmed with the interview participants, if the description was correct, complete and realistic, if the included themes were accurate and if the researcher's interpretation was fair and representative. In this study, the member check was conducted at the beginning of the following interview or at end of the interview for one-time interview. Member checks had assisted the researcher to identify her own biases and misunderstandings of what she had observed or gathered.

(3) Peer Examination

Peer examination seeks colleagues to comment on the findings as they emerge (Merriam, 2001). Newman and Benz (1998) explain that peer examination is important to counter situation where the researcher is familiar to the phenomenon in the study at the expense of objectivity. In this study, opinions from other professionals were sought to provide the researcher a different perspective and this was especially helpful when a breakthrough was needed when the researcher faced a bottle-beck situation during the data analysis phase, especially in synthesizing the findings, which was of great anxiety and uncertainty.

(4) Audit Trail

In the context of research, the researcher authenticates each step of the study by recording each work done from collecting, coding, transcribing, analyzing field data and finally synthesizing the findings. An audit trail can contribute to the research community because other researcher can replicate the study (Newman and Benz, 1998) and the derivation of conclusion can be known (Merriam, 2001).

3.10 Model and Method of Qualitative Data Analysis

In this study, it was a challenging task for the researcher to analyze a large quantity of rich data. However, various analytic techniques allowing for iterative data collection and analysis were followed from Miles & Huberman (1994). The processes of data collection and data analysis happens simultaneously, they are tightly interwoven, recursive and dynamic (Creswell, 2008; Gay *et al*., 2006; Merriam, 2001; Marshall & Rossman, 1995). While collecting data, other information previously collected was analyzed to look for major ideas. Both the processes interacted continually so that the emerging thoughts of the researcher became the focus for the next data collection period. These processes of successive approximation continued until theoretical saturation has been attained whereby the iteration process does not bring forward any more new ideas.

In semi-structured interviews, pre-planned questions were used to explore certain specific topics. These cue questions, then, automatically provide themes for investigation and subsequent analysis of the data gathered. The pre-developed *a priori* themes were used as a tentative theme list to guide the data coding process in order to generate the main codes and themes. It is common for themes to be identified in advance because a research study starts with the assumption that certain aspects of the phenomena under investigation should be focused on. Themes that are generated in this way are referred to as "*a priori*" themes. Another justification for using *a priori* themes is that the important issues in relation to the topic under study is so well established that one can safely expect them to arise in the data. For example, in this study, "accountability" and "quality improvement" may be safely used as *a priori* themes, given their prominence in the literature. The key advantage of using *a priori* themes is that they can hasten the initial coding phase of analysis that is usually very time-consuming. One possible pitfall for using *a priori* themes is that matters that

may not related to the *a priori* themes may be overlooked during data analysis because of intense focus on data that fit the *a priori* themes. On the other hand, the researcher may fail to recognize when an *a priori* theme is not proving to be the most effective way of characterizing the data.

According to Miles and Huberman (1994), codes would all be defined *a priori* in a purely positivist study, whereas codes would arise from the analysis in a purely interpretivist study. This study used both types. A pre-developed *a priori* themes as in Table 3.2 below was used as a tentative theme list to guide the data coding process in order to generate the main codes and themes. They were subject to redefinition or removal as any other themes. The researcher restricted the number of a priori themes as far as possible to avoid lumbering effect on the data analysis. Yin (1994) stresses that the *a priori* consideration of data analysis methods is important to the development and execution of any research design as it compels the researcher to think about the type of data that will be collected, its purpose and how the data will be analysed. With the carefully devised pre-planned interview questions and cues accurately representing the concepts or issues investigated, any resultant contamination in this study was minimal.

The researcher played the key role, and the quality of the analysis was dependent heavily on the researcher's intellectual qualities. The analysis of qualitative data method typically involves three iterative steps as suggested by Gay *et al*. (2006):

- *reading/memoing* – process of writing notes in the field notes margin and underlining important issues found during the initial reading of narrative data;

- *describing happenings in the setting* – developing thorough and comprehensive description of the participants, the setting, and the phenomenon studied in order to convey the rich complexity of the research;
- *classifying research data* – grouping small pieces of data into more general categories in order to make sense and find connections among the data. Field notes and transcripts are broken down into small pieces of data, and these pieces are integrated into categories and often to more general patterns.

In this study, the interview data was recorded and coded schematically. The researcher transcribed the interview sessions and the data was coded and arranged systematically as shown in Table 3.2 below.

Table 3.2:
Research Interview Protocol and Coding of Data into Themes and Concepts

Process	***Possible themes***	***Sub-themes***	***Concepts***	***Sources of data***
Professional Development	Implementation and development	• Skills • Knowledge • Learning opportunity • Education • Formal learning • Training • Conference • Research • Monitoring • Evaluation • Community • Culture • Changes	Knowledge and skills-based	Survey and interview
Principal's professional development	Advancement	• Leadership • Supervision • Teaching and learning • Curriculum • Knowledge • Skills • Challenges • Competency • Problem solving • Mission • Vision • Community • Values	Continuous learning, increasing knowledge and performance	Survey and interview
Educational Reform	Changes	*Classical learning *Systematic methods *ICT intervention * Career Market Development	Changing for development, advancement for the sake of teaching and learning	Survey and interview

In this study, content analysis was also utilized to analyze the data by identifying, coding and categorizing the primary patterns in the data, which allowed the themes to

emerge from the raw data. Merriam (2003) terms this as grounded theory approach whereby the analysis process is based on a systematic approach of coding. The researcher recognized that qualitative data should be analyzed as it is collected because qualitative research design is emergent. First, the researcher collected data and prepared it for analysis by typing and transcribing it verbatim. The researcher then read and re-read the text and wrote down the impressions that he got from the text as he read. In scrutiny, initial categories of information about the study's phenomenon were formed. This procedure is called *open coding*.

The data were then identified by dividing text data into analytically meaningful segments, which were sorted and rearranged in order to make a general sense of the data. This is a process of "reducing a text or image database to descriptions and themes of people, places or events" (Creswell, 2008, p. 268). Codes were then examined for overlap and redundancy and these codes were collapsed into broad themes (also known as main themes or *categories*) or descriptions of the setting or participants. This procedure is called *axial coding*. This was done using NVivo 8 software to organize and manage the mass of the collected data. In this way, the data were explored and findings were easily visualized.

Themes are similar codes aggregated together to form a major idea in the database while a description is a detailed representation of people, places or events in a setting in qualitative research. Detailed descriptions in this study helped to transport the reader to a research site or help the reader visualise a person or event vividly. *Selective coding* was employed to identify the main themes in the data and related them systemically to other

categories that were developed in the axial coding process. The naming of the themes, like codes, followed suggestion from Creswell (2008) typically classifies themes into four types; *ordinary themes* (expected to find), *unexpected themes* (surprises and not anticipated to emerge during study), *hard-to-classify themes* (difficult to fit into one theme) and *major and minor themes* (primary and secondary ideas).

The constant comparative method was used as a data analytic technique in the present study. This method was developed by Strauss and Corbin (1990) originally to develop grounded theory. However, as it involves inductive and concept-building orientation of all qualitative research, it has been widely used by many researchers not seeking to build substantive theory (Merriam, 2001). As the name implies, the basic strategy is to constantly compare among data sets and themes generated and also within and between levels of conceptualization until findings are confirmed. Merriam (2001) proposes several useful guidelines to determine the efficacy of categories or themes derived from the constant comparative method of data analysis:

- Categories should reflect *the purpose of the research* – categories are answers to the research questions.
- Categories should be *exhaustive* – all important and relevant data should be able to be classified into a category or subcategory.
- Categories should be *mutually exclusive* – a particular unit of data (any meaningful segment of the data) belongs to only one category. Otherwise, categories need to be refined.
- Categories should be *sensitizing* – Naming of the category should give some sense

of their nature.

- Categories should be *conceptually congruent* – the categories must be characterized according the same level of abstraction.

3.11 Summary

The effectiveness of school management and leadership greatly depends on the knowledge, competencies, and good dispositions of school principals. No senior teachers appointed to be school principals can be effective without undergoing management and leadership training, which must begin with the correct identification of areas and needs to be developed and upgraded. The failure to do so will certainly render training programs futile and useless, and thus an educational reform such as in Oman will not be lead and managed well at the school level.

This study made use a survey for the purpose of identifying the critical areas and needs of professional development of school principals in Oman. In addition, interview sessions with principals and observations were made on six case schools in Muscat city in order to examine the scenario, challenges, and problems in school management and leadership in the context of educational reform. This chapter has elaborated in detail the research methodology and analysis of quantitative and qualitative data to answer the research questions appropriately.