

CHAPTER THREE

DESIGN OF RESEARCH

3.1. INTRODUCTION

This research examined the effects of motivational orientation on academic achievement and its influence on better assisting teachers and learning personnel in the positive development of students to their full academic potential. It observes students' reasoning of attendance at school while exploring and examining their motivations. The study delineated findings in relation to students' motivation and their achievement levels within the academic fields of literacy and numeracy. Therefore, the purpose of this research was to explore whether students' motivation changes as they progress through their traditional, formal schooling experience.

The research acknowledges that many factors have an influence on the lives of students and that these various factors have an impact on their attitudes towards schooling and learning. However, through empirical data, it explores possible links between age, gender, motivational orientation and academic achievement. The design of the research allows the quantitative aspects of these questions to be explored and developed. Hence, an empirical approach that assists in the gathering of multiple students' responses has been utilized to cater for the diversity of the districts of schools applied to this study.

In this chapter, the methodology of the research project is addressed. To understand the design of the research employed by the researcher, the chapter consists of two components. First, the research design is examined through the orientation employed by the research. This orientation is also affected by the epistemological stance and theoretical framework assumed by the researcher. Within the design of the research, the methodology of survey research is explored as well as the specific method utilised in the data collection process. Research particulars are then divulged and insights gained through inspection of the sample of the research participants, the research instruments applied during data collection methods, the procedure and strategies employed in collecting the data and finally the process for its analysis.

Once an understanding of the research design and methodology has been achieved, the author continues the validation process by conducting a pilot study on a predetermined smaller sample size. This course of action allows the main research instrument to be scrutinized according to its validity and reliability. From this practice, analysis of the research instrument informs the researcher of any concerning issues and changes that need to occur for the main study. Secondly, this chapter concludes with the ethical considerations examined throughout the planning and designing of the study. A summary provides a review of the whole process employed by the researcher to conclude the methodology chapter. Figure 3.1 illustrates the outline of this third chapter.

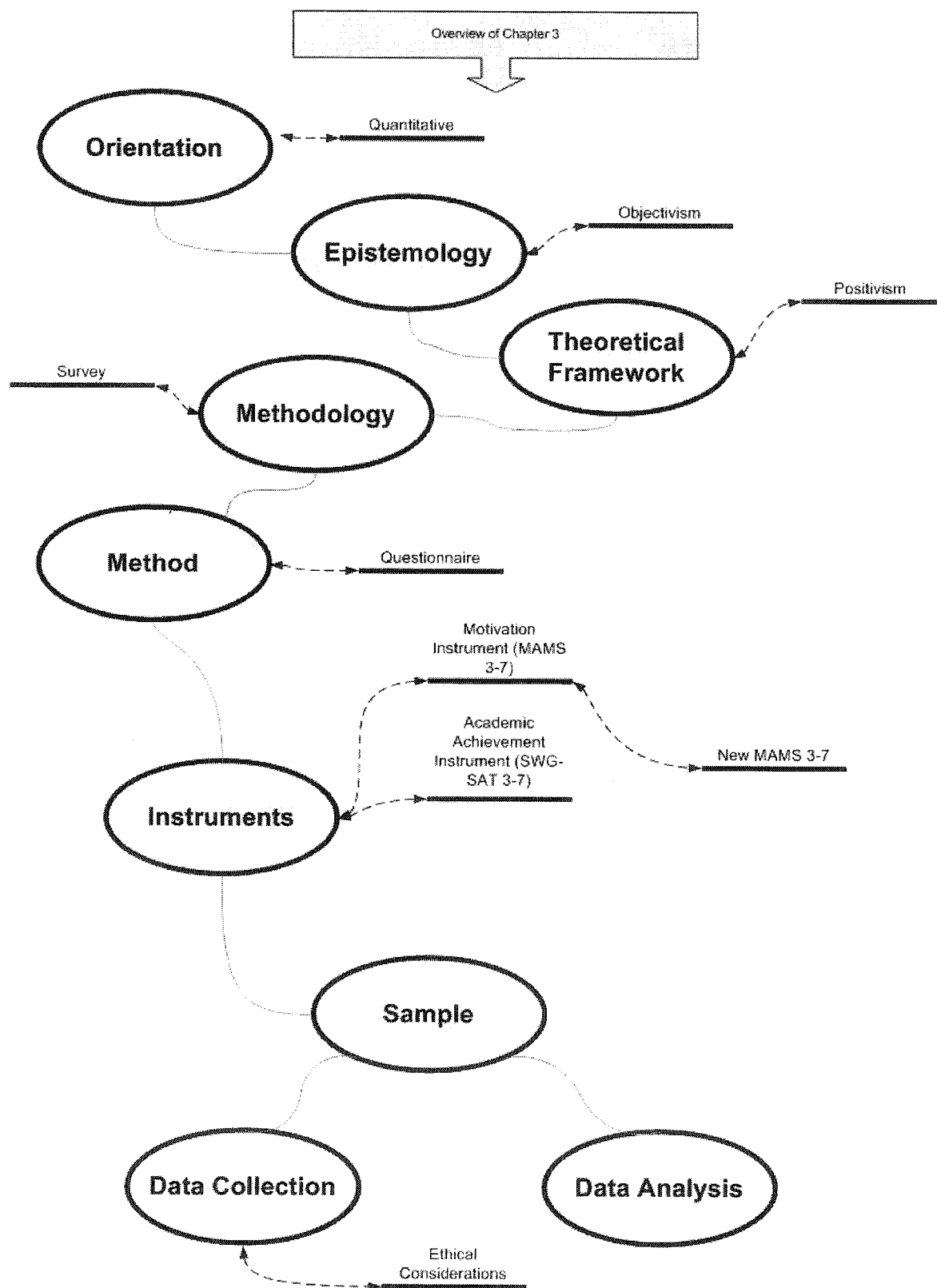


Figure 3.1. Overview of Chapter 3

3.2. DESIGN OF RESEARCH

Before delineating the research design, it is important to understand the orientations employed by the researcher. The research, due to its nature, is quantitative in its orientation. For this type of research, in the social science field of education, an epistemological stance of objectivism is best applied when interpreting the research study. This approach establishes a linear flow within the research study. From this objective concept of knowledge, the research works within the theoretical framework of positivism. With its orientation working within the methodology of survey research, the main instruments created for this particular design were questionnaires, which are well suited to the overall format of this research project (Neuman, 2004). All of these factors influence the researcher's choice of a quantitative orientational design. Since the data to be analysed, in assisting to generalise the hypothesis, is a measurable amount and is showing correlational relationships between variables the research falls into the paradigm of quantitative research.

3.2.1. Research Orientation (Quantitative)

Quantitative research reflects a linear research pathway or a fixed sequence in discovering the objective truths that exist (Allan & Skinner, 1991). It is about using "variables & hypothesis" to understand the behaviours of people within the world. A quantitative orientation of empirically measuring data is required to analyse the hypothesis of the study. Quantitative research allows for the measuring of variables and testing of hypotheses to link to causal relationships, to which generalizations of the population can be made. Major objectives of quantitative research can include hypothesis testing and establishing relationships between variables. For this reason, a quantitative research orientation is the optimum design to test the hypothesis that the variables of motivation, grade and gender are relational to academic achievement.

Quantitative research falls into two broad types: (1) Primary research where the researcher both collects and analyses the data; and (2) Secondary analysis where the data is from a secondary source (e.g. government surveys) (Allan & Skinner, 1991). This research project uses both primary and secondary sources of quantitative data. The primary instrument was generated by modifying a pre-existing

instrument while the secondary instrument was a government survey completed by students in all Queensland educational settings.

It has been argued that, quantitative research is difficult in the fact that it requires explicit prior thought of what data is to be collected, and what variables need to be clearly defined (Allan & Skinner, 1991). Through the literature of previous researchers, it has been established that indeed there is a casual link between a student's motivation and their academic achievement levels (Deci & Ryan, 1985, 1992; Cameron & Pierce, 1994, 1996; Harter, 1985). Therefore, variables have been pre-established by prior research findings. However, further examination into its effects as students progress through traditional schooling are examined as many researchers have only examined its effects on students from adolescence onwards. Insight into the variables being examined, allows an appropriate design to be used to collect the appropriate data and to analyse these variables. In this instance, the two variables were motivation and academic achievement in literacy and numeracy. Thus, a quantitative methodology was selected. Quantitative methodology allows the researcher to examine past research findings in recent literature and use these to construct the most appropriate instruments and procedures for collecting the quantitative data that will assist in explaining the casual link between the clearly defined variables that were established prior to instrument construction.

A difficulty with quantitative research is that ideas and objectives may change during the course of the research, which could lead to a mismatch between the data collected and its analysed results, and the theoretical perspective used to define the research (Allan & Skinner, 1991). By clearly establishing a hypothesis to be tested, clearly defining the research problem and developing noticeably distinct variables, quantitative research can proceed in a linear pathway to develop generalizations about the correlations being explored through hypothesis testing. To alleviate such a problem occurring in quantitative research, the researcher had thoroughly prepared pilot work to ensure that not only the measuring instrument has been thoroughly tested, but also that research objectives were clarified and refined before the main data was collected (Allan & Skinner, 1991).

By firstly establishing a research orientation, then the ideologies of a particular epistemological stance and theoretical framework begin to interact with the research

design. With a pre-established orientation of quantitative, the researcher already works from a certain view upon the world and how knowledge is constructed within it. Quantitative studies outline a general paradigm of enquiring, that is, underpinned by the scientific approach consisting of deductive proof or deduction (Dewey, 1933). Deduction begins with an elaboration of a set of principles that are tested through empirical observations. Variables need to be carefully considered and operationalized or made measurable (Gray, 2004). Through these operational indicators, measurable data is collected only on what is observed. Therefore, subjective and intangible evidence is disregarded in this objective search for truths.

3.2.2. *Epistemology (Objectivism)*

“Research is fundamentally about understanding and explaining – about ‘knowing’” (Wadsworth, 1984, p. 5). A researcher undertakes the task of discovering an understanding to the research problem that exists within the context of their reality. This process of knowing reflects the researcher’s epistemology of how knowledge is constructed. One’s epistemology is how one constructs knowledge, from the truth and meaning that exists in the external world (Gray, 2004). The epistemological stance of the researcher is a belief in the establishment of objective truth. Therefore, this research stems from the theoretical idea of objectivism. It establishes a view of human knowledge of how and why occurrences take place in the world. It is not constructed by the subjects to create their own meaning as in constructivism or subjectivism, where knowledge stems from the subject’s beliefs. It is based entirely on observable facts.

Within the context of the setting for this research problem, education takes a major role. Objectivism is achieved through social sciences and an understanding within it. This social research applies the process of setting out to answer questions by systematically and rigorously collecting observations and imaginatively generating explanations about how and why such thing occur within people themselves (Wadsworth, 1984). It considers that, reality exists independently of consciousness; therefore, it is an objective reality that is out there (Gray, 2004). One of the main focuses of objectivism is that knowledge and to know is objective fact that it is agreed upon. This generalisation of the population and having measurable evidence to support a hypothesis is one of the main objectives of quantitative research and why

the author has chosen it as the research design. It is understood that fact and truth are made from people's socially shared perceptions of the world (Wadsworth, 1984); hence, opinions and perceptions that people all agree upon. For example, subjective is when one person decides that they are hot. Objective is when everyone else subjectively decides that they are hot and concede that the other person must, therefore also be hot (Wadsworth, 1984). This then accedes to the objectiveness of reality becoming the knowledge, which is agreed upon by many. This research wishes to objectively conclude the study with an agreed upon perspective of the research problem within the given context. It achieves this through using quantitative data to explore the correlations between a students' grade, gender, motivational orientation and academic achievement.

This objective construction of knowledge, by extracting the truth and gaining meaning of the world, is forcibly done by using numbers and generalisations from examining these numbers. The search for the truths behind the proposed hypothesis, are examined by observing students and gathering measurable data. This is the reason behind the use of a quantitative design to research, as it stems out of an objectivism epistemology.

3.2.3. *Theoretical Framework (Positivism)*

From this objectivism perspective, knowledge is gained through gatherable and observable data. The method best used to describe this theoretical framework to the research problem is positivism. Positivism is a dominant epistemological paradigm within the social sciences (Gray, 2004). It is argued that the world exists externally to the researchers and that this is measured by observations.

Both the natural and social worlds operate within a strict set of laws discovered through empirical inquiry (Gray, 2004). Positivists believe that these scientific laws or generalizations are achieved through the continual and progressive accumulation of facts about the world (Gray, 2004). These facts are generalized from observations on social phenomena, to make statements about behaviour and about the behaviour of the population as a whole (May, 1997). Positivists believe that they can predict and explain behaviour based on questioning participants, because they believe that people "act on" and "react to" different aspects of our social environment. That is,

people are a product of the environment in which they live (May, 1997). They explain human behaviour in terms of cause and effect.

Gray (2004) argues that the essence of positivism lies in arguments that:

- reality consists of what is available to the senses – that is, what can be seen, smelt, touched, etc;
- inquiry should be based upon scientific observation (as opposed to philosophical speculation), and therefore on empirical inquiry; and
- the natural and human sciences share common logical and methodological principles, dealing with facts and not with values (p 18).

Positivists believe that experiments in laboratory conditions are artificial and do not reflect the complications, real life decisions and contradictions that are involved in the living of social life (May, 1997). They believe in the principle of replication. That means that if a study is conducted again and again in similar circumstances and environments, similar findings will result each time (Neuman, 2004). The research of this study, outlined as quantitative in design, operated from this positivism framework. The researcher believes that through empirical testing of nomothetic or law like principles, the research provides value free science that is checked through statistics. It is objective and value free because of the statistical research (Neuman, 2004). By using a deductive approach of testing through observations, a positivist can construct knowledge or objective truth with a quantitative design. Measurable data is collected to assist in providing statistical data to examine and establish generalizations. When using quantitative data to objectively analyse observations of students' behaviours, a methodology and method needs to be created that will compliment the research process. The methods used to create instruments for collecting empirical data on the variables needs to be considered carefully and assessed thoroughly to produce a procedure most appropriate for the collection of the measurable data.

3.2.4. Methodology (Survey Research)

This research aims to gain a better understanding of students in relation to their motivational orientations and its effect on their academic achievement. To analyse a sample of the population and examine the correlations that exist between these two variables, data needed to be collected from a variety of students across districts of

the chosen sample area. Hence, a survey research methodology was appropriate to use within a quantitative paradigm, to assist in the accumulation and analysis of data for the research project.

Surveys aim to produce results that are replicable by following the same method. They are standardized. Theory is structured and the participants are asked the same questions in the same manner. If they express differences in opinion, this is then noted as a true-difference. Surveys are often used in quantitative research to test theories or construct theories by beginning with a pre-established theory. Hypotheses are formed and deduced from a theory. Statistical evidence is then used to establish and reinforce a theory in order to develop causal relationships between the variables. The survey research method allows the researcher to have a random sample. This study had a cluster sampling of various districts within catholic education in southeast Queensland. Representativeness is when the survey method is used to make claims about a population that contain statistically significant results that are not expected just by chance. Surveys allow hypotheses to be operationalized into measures and then confirmed or falsified. To do this, questions must be capable of categorization and quantification.

Most survey research is non-experimental in design (Allan & Skinner, 1991). Practical and ethical considerations prevent the research to be able to expose the participants to particular conditions and hence prevent the use of an experimental design. A problem with this non-experimental design is that the researcher cannot know whether they are comparing like values. They cannot ensure that any effects being measured are not attributed to some pre-existing difference (Allan & Skinner, 1991). With this all taken into consideration, the researcher deemed survey research a suitable methodology to use for this study. It allows for the accumulation of data from a clustered sample and produces data that is measurable and able to be quantified.

3.2.5. Method (Questionnaire)

The instruments used within this survey research method, took on the form of questionnaires. Many advantages and disadvantages for this particular instrument design needed to be considered before determining the appropriateness of this type of method. Advantages associated with this method include the following aspects.

- Questionnaires are less expensive than other methods.
- They produce quick results.
- Questionnaires can be completed at the respondent's convenience.
- They offer great assurance of anonymity.
- They offer less opportunity for bias or errors caused by the presence or attitudes of the interviewer.
- Questionnaires are a stable, consistent and uniform measure, without variation.
- They offer a considered and objective view on the issue, since respondents can consult their files and since many subjects prefer to write rather than talk about certain issues.
- The use of questionnaires promises a wider coverage, since researchers can approach respondents more easily than other methods. (Sarantakos, 1998, p. 224)

Limitations in the use of questionnaires can be effected by the following factors.

- They do not allow probing, prompting and clarification of questions.
- They do not offer opportunities for motivating the respondents to participate in the survey or to answer the questions.
- The identity of the respondent and the conditions under which the questionnaire was answered are not known. Researchers are not sure whether the right person has answered the questions.
- It is not possible to check whether the question order was followed.
- Questionnaires do not provide an opportunity to collect additional information (e.g. through observation) while they are being completed. There is no researcher present, for instance, to make observations while the questions are being answered.
- Due to lack of supervision, partial response is quite possible. (Sarantakos, 1998, p. 225)

With due consideration into these factors and the educational setting of this research project, a questionnaire was the easiest and most effective instrument to use in collecting measurable data for this quantitative study. Objectively, a questionnaire allows students to autonomously and anonymously complete the survey with their own ideas and attitudes rather than being influenced by an administrator. Students of a young age need an instrument that has minimal confusion in its readability and a straightforward approach to its completion. Due to this deliberation, the researcher chose to use a Likert scale for responses to items on the questionnaire. "The Likert Scale is one of the most useful question forms" (Anderson, 1990, p. 211) used in questionnaires. It is named after Rensis Likert and most commonly takes the format where the respondent is presented with a sentence and is invited to agree or disagree according to a five-point scale. It is an effective method to use as it observes the following rules for sentencing, which make it more readable for younger students. It: contains single sentences containing only one complete thought; contains statements that are short, and rarely exceed twenty words; contains statements of present tense; avoids factual statements; avoids statement that may be interpreted in more than one way; avoids the use of universals such as all, always, none and never; and avoids the use of double negatives.

With these factors considered, especially in relation to the subjects of the study, a questionnaire in a Likert format provided an easy instrument of assessing students' attitudes towards schooling, and thus how they are motivated. Likert scales are an excellent means to collect data on opinions and attitudes (Anderson, 1990). They allow for a great deal of information to be collected within a short timeframe, while also allowing the responses to be analysed effectively in an empirical form.

Once this appropriate method for collecting data was determined, the use of such an instrument and the procedure strategies was validated by completing a pilot test of the instrument. The pilot testing allowed for ambiguities in the instructions and the wording of questions to be clarified. It permitted the researcher to examine the overall reactions to the questionnaire. Pilot testing sanctioned and justified the validity and reliability of the research instrument in relation to the design of the study. From the insight into these concepts, modifications and changes were made.

3.2.6. Reliability and Validity

Validity relates to the match between the findings and reality (Merriam, 1998). Face validity was examined by teachers and professionals within the educational field by examining the instrument, scrutinizing it and by making comments and recommendations for the instrument. For this study's purpose, a panel of experts within the field of education examined the motivational scaled instrument based within a questionnaire design. Feed back was gained from Principals, Key Teachers, teachers specializing within the early childhood field, Lecturers in Education and in Languages and Literacy. On conclusion, face validity was re-examined after any modifications resulting from the pilot testing. Content validity involved making sure that the instrument contained all related perspectives within the area of research (e.g. making sure that all types of motivation are covered with the questioning on the instrument). This was established through carefully examining the pre-existing theories of researchers, in the most current literature, within the field of education. The researcher's choice of a quantitative design, and the linear approach implicated by the design choice, has established this content validity. Concurrent validity was obtained by having the instrument based on an instrument used in multiple studies, namely research conducted by Vallerand (1993).

Consideration into the use of a particular method is authenticated through the examination of the instrument and its reliability. This is improved by: using multiple indicators of a variable (i.e. many questions relating to the same item); using pre-tests or pilot studies (i.e. drafts and trial before constructing final version of the instrument); or by replicating measures used by other researchers. To warrant the reliability of this study the researcher has ensured that all this occurred.

3.3. RESEARCH INSTRUMENTS

For the data to be collected on a student's motivation and their academic achievement, two instruments were employed. These instruments needed to be easily comprehended by the range of participants within the study. The readability has to cater for students in both Year 3 and Year 7. Once this design factor was considered, thought also needed to be paid towards the quantitative orientation behind the methodology of this study and the appropriateness and ability of collating the data in empirical terms. Another factor of concern was the reliability and validity

of the instruments to be utilized. On reflection of this matter, pre-existing instruments were examined and evaluated to their appropriateness for this study. On completion of these considerations, the two instruments chosen were a modified version of Vallerand's (1993) "Academic Motivation Scale (AMS-C 28)" and the use of the results of the State Wide Government Standardised Academic Testing procedure known as 'The Queensland Year 3, 5 & 7 Tests in the Aspects of Literacy and Numeracy' compiled by the Queensland Studies Authority.

3.3.1. Modified Academic Motivation Scale

The primary instrument used for this research was a modification of Vallerand's "Academic Motivation Scale (AMS-C 28)" (Vallerand et al., 1993). In this scale, there are four items to assess each of the seven motivational constructs (thus a total of 28 items): (a) intrinsic motivation-knowledge; (b) intrinsic motivation-accomplishment; (c) intrinsic motivation-stimulation; (d) external regulation; (e) introjected regulation; (f) identified regulation; and (g) amotivation. This original instrument was developed for college students. The modified version will be referred to as the Modified Academic Motivational Scale (MAMS 3-7). Questions used the same 5-point Likert scale as the original. All 28 items were simply reworded so that students of a young age group could understand and interpret them. The 28 items were responded to on a scale ranging from 'very much like me' to 'nothing like me'. The scale was represented pictorially for the younger students completing the questionnaire. These pictures consisted of square boxes that increase in size, the smaller box corresponding to 'nothing like me' and the largest box to 'very much like me' (Appendix 1).

Teachers and researchers reviewed the modified instrument and pertinent changes were made. A pilot study, with a small sample of Year 3 students was conducted to ensure the readability and reliability of the instrument.

3.3.2. Pilot Study

A pilot study was administered to 61, year three students, from the diversity of three different class settings. The classroom teachers administered the questionnaire in their individualistic, classroom setting during the course of a regular school day. Each question was read aloud by the teachers to the students, who then coloured a box according to the five-point Likert scale, that was most appropriately matched their

attitudes towards schooling. The pilot study's participating students' ages ranged from seven to nine years old.

3.3.3. *Results of Pilot Study*

The completion of a pilot study allowed for feedback to be obtained from the participants through the observations of the administrators. Some ambiguities in the instructions were pointed out by the classroom teacher administrators. Comments from the class teachers who administered the questionnaire suggested slight changes to the instrument. It was suggested that for better readability, column headings should appear at the top of every page as students had difficulty in remembering what each column represented. Overall, the classroom teachers noted that students followed the directions well. The colouring of boxes according to a five-point Likert scale was understood by participants at this age. It was also noted that students of this age group related well to the descriptors of the responses (from 'very much like me' to 'nothing like me').

Analysis of the pilot study was generated by using SPSS. Exploration of the data was completed by a simple descriptive analysis of the frequencies and by examining the reliability of the statistics to determine the validity of each of Vallerand's (1993) seven scales, through Cronbach's Alpha. Tables 1 through to 7 summarise the items associated within the seven factors delineated by Vallerand (1993) together with the Mean and Standard Deviation for the sixty-one students who participated in the pilot study.

Table 3.1. *Intrinsic Motivation – To know*

Item No.	Question	Mean	Standard Deviation
2	I go to school because I like learning new things.	4.57	0.88
9	I go to school to discover new things that I never knew before.	4.57	1.04
16	I go to school for the terrific feeling of knowing more about things that interest me.	4.51	1.03
23	I go to school to keep learning about things that interest me.	4.64	0.91

It can be seen through the means that the scale of 'Intrinsic motivation – To know' was rated highly with these Year 3 students' ideas and attitudes towards their schooling. The standard deviation ranged from 0.88 to 1.04, indicating that the spread of responses from the students did not show a great deal of discrepancy. The general tendencies for responses within this intrinsic scale had these students strongly agree with the statements of each items. This data showed that the students of year three, in this particular setting, were highly motivated to learn new and interesting things at school.

Table 3.2. *Intrinsic Motivation – Accomplishment*

Item No.	Question	Mean	Standard Deviation
6	I go to school for the wonderful feeling of getting good grades in my schoolwork.	4.54	0.96
13	I go to school for the great feeling I get when I do better than I have before in my learning.	4.28	1.20
20	I go to school for the great feeling I get when I finish something that is difficult to do.	4.54	1.10
27	I go to school because school allows me to feel good when I achieve well.	4.61	0.92

The results represented by students in Year 3, illustrated that the majority of students answered the questions relating to accomplishment in the intrinsic motivation scale, as either 'exactly like me' or 'fairly much like me'. The range between the means is 0.33, also concurring that the responses from the students were quite similar. These results illustrate that the same group of students from year three were also highly motivated towards achieving or accomplishing some kind of personal goal of improving themselves.

Table 3.3. *Intrinsic Motivation – To experience stimulation*

Item No.	Question	Mean	Standard Deviation
4	I go to school for the great feeling I get when I share my ideas with others.	3.77	1.32
11	I go to school for the wonderful feeling of reading books from interesting authors.	3.93	1.56
18	I go to school for the wonderful feelings I get when I take in all the information that people have written about.	4.05	1.41
25	I go to school for the good feeling I get while reading about lots of interesting things.	4.23	1.10

Student responses varied ever so slightly with the factor of experiencing stimulation within the scale of intrinsic motivation, having a greater range between the means. The range within the factors means of each item was 0.46, still illustrating similar answers amongst the students. The standard deviation also illustrates similar findings, however showing that students' responses within these items were slightly further spread than those items within the previous two factors. One possible reason for the lower mean of item number four, relates to a student's confidence in sharing their opinions with other members of their class.

Table 3.4. *Extrinsic Motivation - Identified*

Item No.	Question	Mean	Standard Deviation
3	I go to school because it will help me with the job that I want to do.	4.00	1.46
10	I go to school so I can get the job that I really want to do.	4.03	1.46
17	I go to school because it helps me to make a better choice about what job I'll do in the future.	4.56	1.04
24	I go to school because I believe that it will make me a better worker when I get a job.	4.54	1.04

The trends of responses for the factor of identified extrinsic motivation, although similar, with a majority of Year 3 students answering with the 'fairly much like me' response, are slightly less in the means compared to those represented with the factors of intrinsic motivation. However, it still shows a similar response amongst the questions of the scale, with students strongly agreeing to the statement of each item. In addition, the limited difference between the means shows that students are moderately motivated about learning at school because of the opinion that good grades or high marks will ensure that you get a better job.

Table 3.5. *Extrinsic Motivation - Introjected*

Item No.	Question	Mean	Standard Deviation
7	I go to school to prove that I can finish primary school	4.02	1.43
14	I go to school so that when I get good marks I feel better than the other students.	3.03	1.89
21	I go to school to show that I am a smart person	4.02	1.41
28	I go to school to show myself that I can do it.	4.56	1.06

Introjected extrinsic motivation revealed an insightful understanding into younger students' motivational orientation. The responses for item number 14 varied considerably in relation to the means scores of the other items within the factor. Feedback from the teachers administering the questionnaire confirmed that many students struggled with the wording of the question. Students agreed that they wanted good marks at school however; they experienced issues with the second part of the complex sentence. Students were not willing to agree with trying to feel better than the other students do. Very strongly intrinsically motivated students argued that they only felt good because they had achieved what they wanted to achieve. In spite of this, year three students still had quite a strong motivation towards proving their intelligence both to themselves and for others.

Table 3.6. *Extrinsic Motivation – External regulation*

Item No.	Question	Mean	Standard Deviation
1	I go to school because only by going to school I will get a good job.	3.85	1.53
8	I go to school so I can get a great job when I grow up.	4.43	1.06
15	I go to school because I want a good life when I get older.	4.52	1.06
22	I go to school so that I will get a good paying job in the future.	4.46	1.16

Items 8, 15 and 22 showed similar trends of the previous scale, with students strongly agreeing with the statements. However, item 1 caused some variations in the mean of the responses. It is believed that the students experienced difficulties in the wording of the question. Some student's attitude was that school is not the 'only' way to get a good job. They agreed that going to school and achieving well would assist in obtaining a successful job, but felt it was not the only factor that contributed. It is also evident through the spread in the standard deviation that student responses were more widely spread than the other items within the scale.

The results of the extrinsic motivation factors in comparison to those of the intrinsic motivation factors, shows a greater range between the individual items within each separate factor. Intrinsic motivation, overall, rated higher in the student responses.

Table 3.7. *Amotivation*

Item No.	Question	Mean	Standard Deviation
5	I don't know why I go to school. It is really just a waste of time.	1.67	1.43
12	I wonder if I should continue going to school.	2.56	1.92
19	I don't know why I go to school, and really I wouldn't care if I did go or not.	2.11	1.66
26	I don't know why I go to school. I can't understand what I am doing here.	1.77	1.47

The trends established with the amotivational scaled showed that students mainly strongly disagreed with the statements. This is very evident with means of all items being less than 3 (or somewhat like me). These items also displayed a greater standard deviation than the previous six scales. A possible deduction from such results is: 1) students at this stage of development are unlikely to be amotivated and; 2) students of this age group expect that these are considered 'bad' answers according to teacher expectations.

To ascertain the reliability of the four items within each scale, Cronbach Alphas were calculated. Table 3.8. summarises the Cronbach alphas for each scale as delineated by Vallerand (1993).

Table 3.8. *Cronbach Alphas*

Factor	Scale	Cronbach Alpha
1	Intrinsic Motivation – To know	0.70
2	Intrinsic Motivation – Accomplishment	0.28
3	Intrinsic Motivation - To experience stimulation	0.43
4	Extrinsic Motivation – Identified	0.63
5	Extrinsic Motivation – Introjected	0.33
6	Extrinsic Motivation – External regulation	0.64
7	Amotivation	0.43

The synopsis of the Cronbach alphas, illustrates that factors 2, 4, 5 and 7 have alphas less than 0.5, indicating a weak correlation between the items included in these factors for the instrument. Further analysis was performed to establish more reliable scales. The three dimensions of intrinsic motivation were collapsed to form one single factor. Amotivation (factor 7) contained a weak reliability with the current items within the scale. The analysis of the data revealed that the reliability could be increased by 0.046 if item 12 within this scale was erased. However, the omittance of the item would reduce the scale to only three items. A decision was made, that the item would remain and discussion would take place with experts within early childhood and literacy fields.

Cronbach alphas were recalculated for the two new factors. Table 3.9. summarises the results of this analysis.

Table 3.9. *New Factors*

New Factors	Cronbach Alpha
Intrinsic	0.78
Extrinsic	0.78

As indicated in Table 3.9., items within the new scales exhibited a higher reliability of 0.78, as compared to the previous un- collapsed scales. Given that the questions for the academic motivation scale questionnaire was modified from an instrument originally designed for college students, discrepancies in the reliability of the original scales was seen as a possibility. Vallerand's (1993) study was aimed at college students who have established a genuine identity of self. It could be expected that college students are therefore, more attuned to their perceptions of schooling and the effect of this on their attitudes towards schooling. For this reason, Vallerand's in depth understanding of the different types of motivation is too precise for younger students and their ability to respond effectively within these former scales. Therefore, the collapsing of these motivational orientations back into the three basic forms is appropriate since the study will be dealing with younger, primary-school aged students.

3.3.4. *Changes to Motivation Instrument*

The literature indicates that Amotivation is a distinct dimension as compared with intrinsic and extrinsic motivation. Concerns were raised in the weak correlation of 0.43 within the items of this scale and, thus expert opinion was sought with regard to the validity of the items within this scale. Academics with expertise in early childhood literacy, believed that younger students experienced difficulty with the readability of these items. It was noted that some questions were double loaded, containing too complex a sentence structure for students at this age. Hence, these items were rewritten for the major study. Table 3.10. summarises the changes made to the questions within this particular scale. It was decided that the compound nature of

items 5 and 26 would be confusing for young students. Thus, items were split into separate questions.

Table 3.10. *Changes to Amotivation Items*

Item No.	Question for Pilot Study	Question for Main Study
5	I don't know why I go to school. It is really just a waste of time.	I don't care if I go to school or not.
12	I wonder if I should continue going to school.	School is a waste of time.
19	I don't know why I go to school, and really I wouldn't care if I did go or not.	I would like to give up school.
26	I don't know why I go to school. I can't understand what I am doing here.	I don't know why I have to go to school.
29	(Extra question)	I don't understand what I'm doing here.

3.3.5. *Summary*

From the pilot study, it was discovered that the original seven scales, as delineated by Vallerand in his original instrument, had a weak reliability. However, when these pre-existing scales were condensed into the three fundamental types of motivation (i.e. intrinsic, extrinsic and amotivation), an elevated reliability was achieved. The reliability of these new scales, according to Cronbach's Alpha was intrinsic motivation at 0.77, extrinsic motivation at 0.77 and amotivation at 0.43. After consultation with professionals within literacy and early childhood fields, items within the original seventh factor of amotivation were reconstructed from complex to more simple structure sentences. This allowed the expansion of the scale from four items to five. When an inter-item correlation matrix was performed on the new three scales, it revealed that the majority of the items within each new scale were positively related to one another. Only the intrinsic scale had a small percentage of negative correlations, however these were only minor.

When looking at the frequency of the scores within the scale of intrinsic motivation, it was discovered that one-third of the students were extremely, highly intrinsically motivated and two-thirds fell into a highly intrinsically motivated range. With the

extrinsic motivation scale, the results showed a wider spread of results, evident through the greater standard deviation. However, it was also concluded that a majority of students were also moderately extrinsically motivated. Only a minority of two students displayed characteristics of being highly effected by amotivation. Figure 3.2. shows these results.

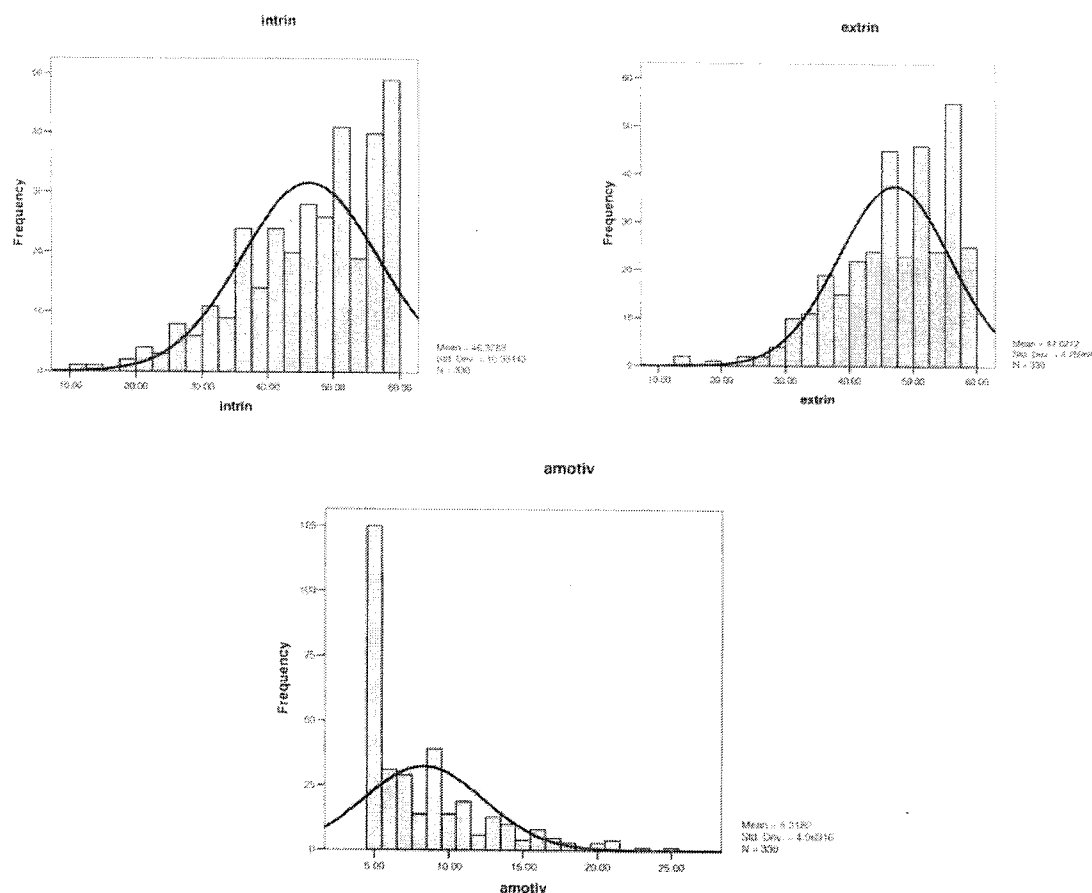


Figure 3.2. Frequency scores of the Motivation Scales

Overall, the pilot study revealed that students at this stage of development are more likely to be either both highly intrinsically and extrinsically motivated; or highly intrinsically motivated with a lower level of extrinsic motivation. Figure 3.3. illustrates these findings in a scatterplot.

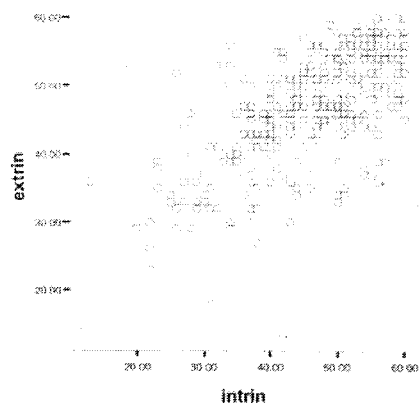


Figure 3.3. Scatterplot of Intrinsic and Extrinsic Motivation levels of students.

Due to the preliminary research conducted, the instrument shows reliability in the three new scales compared to Vallerand's original seven scales. The findings so far, with the appropriate changes as mentioned earlier, ensure confidence in the validity in the motivation instrument. With that in mind, there are no changes to the original hypothesis, that students at this particular stage of development are more likely to be intrinsically motivated than extrinsically motivated.

3.3.6. *Standardised State-Wide Government Tests*

For the main study, the sample completed the MAMS 3-7 test (Appendix 2). They also completed a standardised academic test that assesses levels of academic achievement. This standardised academic test is the State-Wide Government Standardised Academic Tests for year three and seven students (SWG SAT 3-7). This test program was designed to contribute to the improvement of children's learning by providing the government with information on achievement scores in aspects of literacy and numeracy. The tests, based in Standard Australian English, are developed and administered by the Queensland Studies Authority. Tests were developed specifically for Queensland students according to curriculum documents.

The SWG SAT 3-7 contains tests on various aspects within Literacy and Numeracy. The Literacy components of the test include three scales of (a) Spelling, (b) Writing, and (c) Reading and Viewing. Spelling is measured through dictations and proofreading items. It is also assessed through information gathered from the writing task. The Reading and Viewing aspects of the test are assessed through multiple-choice questions focussed around various materials viewed in a magazine. The

written component consists of a written response to stimuli in a selected genre. The Numeracy test is assessed by four scales, examining the mathematical concepts, which include (a) Number, (b) Measurement, (c) Chance and Data, and (d) Space. The test items are either multiple-choice or open-ended questions. Some items require the use of calculators and measurement materials, while others include such mathematical concepts as mental calculations, written calculations and problem solving. The tests cater for a wide range of children's abilities, with some items requiring a deep understanding of mathematical concepts.

3.4. RESEARCH PARTICIPANTS (SAMPLE)

For the main study, the data was collected from seven Southeast Queensland schools, which operate out of a catholic perspective within the Archdiocese of Brisbane. The sample consisted of 330 students, comprising of Year 3 and Year 7. The sample group comprised of a fairly equal number of boys and girls. The characteristics of the group included a vast variety of different ethnic backgrounds, socio-economic status, as well as different family situations, as occurs in general population samples.

3.5. RESEARCH METHODS – DATA COLLECTION

To ensure consistency among the various schools participating in this study, teachers who administered the tests were sent a letter firstly asking for their participation and secondly to outline the set procedure to follow when administering, collecting and in the retrieval of the data completed by students.

3.5.1. Strategies (Procedure)

The MAMS 3-7 was administered to students during the concluding weeks of the first semester, or second term. The MAMS 3-7 was distributed to the students as a single booklet and answer sheet. These were given to the participating teachers for administration to the sample. On completion of the MAMS 3-7, the responses were returned to the researcher in a sealed envelope.

The SWG SATS 3-7 tests occurred in August. These tests occurred over two days. The tests, each day, were conducted in two sessions separated by a short break. The aspects of numeracy were completed on the first day while literacy was

examined on the second day. Teachers administered the tests according to the government guidelines. When the results of these tests were returned to the schools at the conclusion of the school year, the principals agreed to inform the researcher of the children's results.

Both instruments were completed under exams conditions in standard classroom settings. When administering both the MAMS 3-7 and the SWG SAT 3-7, instructions were read for certain questions. Each student was given a copy of the instructions and the test papers. This was further explained in the teacher packs for the SWG SAT 3-7. Students recorded their responses on the answer sheets provided. The government officials in the accompanying information pack directed the duration of these tests. The participants spent approximately 20 minutes completing the MAMS 3-7.

3.6. RESEARCH METHODS – DATA ANALYSIS

Correlation analysis and Multivariate Analysis of Variance (MANOVA) was used to analyse the data. The MAMS 3-7 was scored as an ordinal scale, allowing for a subsequent quantitative data analysis. The SWG SAT 3-7 used an interval scale, with students assigned score based on the number of correct responses for each scale of the two tests. Once the SWG SAT 3-7 was scored, hypothesised relationships were statistically tested and examined using the statistical computer program SPSS.

Firstly, the raw data of the SWG SAT 3-7 and MAMS 3-7 three motivation construct computed scores were entered into SPSS. Secondly, in order to ascertain the reliability of the scales delineated in the MAMS 3-7, a Cronbach alpha was computed for each scale. The results tested the reliability of the predetermined motivational subscales reported from Vallerand's study.

A Gender and Grade (2x2) Multivariate Analysis of Variance (MANOVA) was completed on the three motivational scales of the MAMS 3-7. Once refined, then t-tests were performed on each of the motivational scales individually, to test the hypothesis. On completion of the analysis of the MAMS 3-7, the same process was repeated with the SWG SAT 3-7. T-tests were completed with each of the six subscales of the SWG SAT 3-7 (3 Literacy subscales and 3 Mathematical subscales).

Correlations were then used to explore the relationships that existed between the results of the MAMS 3-7 and the SWG SAT 3-7. All nine subscales were examined, to analyse any relationships that may exist across these two sets of scales.

Content validity for the MAMS 3-7 is supported by the fact that the instrument is a modification of a scale from previous research (see Vallerand et al., 1992, 1993) and has been found to have a high internal consistency level (Alpha values ranged from 0.76 - 0.86,), as well as acceptable test-retest reliability (correlations ranging from 0.71 - 0.83). In addition, experts confirmed that the appropriate modifications were made by the researcher. The Queensland Study Authority ensured that the SWG SAT 3-7 were valid instruments for testing young children's numeracy and literacy achievement. The stringent procedures used for the administration of these two tests in the classroom setting assist in ensuring that the data collection is reliable and replicable.

3.7. ETHICAL CONSIDERATIONS

To maintain confidentiality of the students, the tests were completed anonymously. The researcher did not know individual students' work or answers when the data was being analysed. Confidentiality was kept, by having the administrators assign a coded number for each student. Confidentiality was also kept by having the students complete the MAMS 3-7 as multiple-choice answers. For the SWG SAT 3-7 only results sheets supplied by the government was observed by the researcher. In these cases, students' names were removed and a number code assigned.

To make sure that the study was appropriately ethical, involved institutions were notified of the study, and ethical clearance will be applied for. These institutions included the Human Research Ethics Committee and the Catholic Education Office. Letters of permission were also sent to the participants and their guardians, and signed by both parties (Appendix 3). All students participating in this study were under eighteen, so consent was needed. To follow Queensland regulations, only approved and Queensland registered teachers, with the required Police checks were interacting with the participants who are young children.

3.8. CONCLUSION

Chapter 3 delineated the methodology used throughout the research study. It examined the procedures utilised during the data collection and analysed the instruments used in this process. A pilot study was administered to ensure validity and reliability of the modified motivational scaled instrument. Adequate changes were made ready for administration. The next chapter analyses these empirical findings through various testing procedures. Tables were generated from the data to allow generalisations to occur.