

**A STUDY OF THE FACTORS AFFECTING STUDENT
RETENTION AT KING SAUD UNIVERSITY, SAUDI
ARABIA: Structural Equation Modelling and
Qualitative Methods**

by

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Abstract

The purpose of the study was to identify factors affecting student retention at King Saud University in Saudi Arabia. It has been estimated that 35% of university students leave higher education before completing their studies (Al-Saud, 2006). This study was guided by Tinto's (1975) Student Integration Theory. Berger and Braxton (1998, p. 104) have stated that Tinto's integration model 'has been the focus of much empirical research and has near-paradigmatic status in the study of the college student departure.' This theory is longitudinal and dynamic and views student retention decisions largely as the results of interactions between the student and the academic and social systems of the institution (Tinto, 1975, 1993).

This study used a mixed methods approach. Using the terminology of Creswell (2003), the appropriate description of the overall design of this study is a mixed methods concurrent triangulation strategy. This means that 'qualitative and quantitative data are collected and analyzed at the same time. Priority is usually equal and given to both forms of data. Data analysis is usually separate, and integration usually occurs at the data interpretation stage' (Hanson *et al.*, 2005, p. 229). This strategy was selected because it allows the findings to be confirmed, cross-validated, and corroborated within a single study (Creswell, 2003).

This strategy consisted of two phases. The first phase was the quantitative approach. Quantitative data were collected from 414 freshman students using two questionnaires administered on two occasions and from the university admission office. The quantitative data were analysed using a structural equation modelling (SEM) technique using the AMOS software package.

The results of the SEM indicated that Tinto's model were not useful in predicting the Saudi freshman student retention process. The variables in the model explained only 30 percent of the variance in student retention. The results of the SEM indicated that four of the nine hypotheses proposed in Tinto's model were supported by statistically significant results. Moreover, only three variables had direct effects on retention. The largest direct effect on retention was accounted for by initial goal and institutional commitment (0.49), followed by later goal and institutional commitment and pre-college schooling as measured by high school scores (0.10).

The second phase of this study utilised a qualitative approach. Qualitative data were obtained from three sources: non-persister students, persister students, and staff members. Seventeen non-persister students were interviewed over the phone; 15 persister students were interviewed using a focus group technique; while staff members were asked to complete a survey. Of the 200 surveys distributed, 37 were returned including

responses from 16 lecturers, 12 administrators, 5 librarians and 4 academic advisors.

A comparison was made between those students who persisted and those who dropped out using constructs from Tinto's theory. In relation to students' levels of goal and institutional commitment, it was found that persister students appeared to be more motivated and to have higher levels of goal commitment than non-persister students. Similarly, persister students appeared to have higher levels of institutional commitment than non-persister students, in part it is suggested, due to the fact that the majority of persister students had been able to select their desired majors whereas the majority of non-persister students had not.

In relation to the students' levels of academic integration, there was no significant difference between both groups of students. Persister and non-persister students both exhibited low levels of academic integration into the university system. In addition, there was no significant difference between both groups of students in terms of social integration. Both groups of students indicated low levels of social integration into the university system.

In addition, the participants (persister students, non-persister students, and staff members) were all asked to indicate what they perceived to be the major factors affecting student retention at King Saud University. The findings from the qualitative data not only help to explain and confirm the quantitative findings but also identify why Saudi freshman students leave the university before completing their studies. The most important factors were: difficulties of selecting majors, difficulties of transferring between subjects, lack of academic advice and irregularity of monthly reward.

Dedication

I would like to dedicate this thesis to all my family members for their support. I would like especially to dedicate this to my wonderful and lovely daughter, Ranad.

Acknowledgments

I wish to acknowledge a number of people who have supported me throughout my research and thesis writing.

I would like to thank my supervisors Prof. Mike Osborne and Dr. Iddo Oberski for their help, support, guidance, and patience.

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Table of Contents

ABSTRACT	I
DEDICATION.....	III
ACKNOWLEDGMENTS	IV
CHAPTER 1 - INTRODUCTION	1
1.1 THE RESEARCH PROBLEM.....	1
1.2 PURPOSE OF THE STUDY	2
1.3 OVERVIEW OF THE STUDY METHODOLOGY	3
1.4 BACKGROUND OF THE STUDY	4
1.4.1 Education in Saudi Arabia	4
1.4.2 Admission to higher education.....	9
1.5 SIGNIFICANCE OF THE STUDY	11
1.6 ORGANIZATION OF THE THESIS	12
1.7 DEFINITIONS OF KEY TERMS.....	12
CHAPTER 2 - REVIEW OF THE LITERATURE.....	14
2.1 INTRODUCTION	14
2.2 STUDENT RETENTION THEORIES	14
2.2.1 Spady's (1970) Theory of Student Departure.....	16
2.2.2 Tinto's (1975) Student Integration Theory.....	19
2.2.3 Pascarella's (1980) Attrition Theory	24
2.2.4 Astin's (1984) Student Involvement Theory.....	26
2.2.5 Bean and Metzner's (1985) Student Attrition Theory.....	28
2.2.6 Cabrera's (1992) Integrated Retention Theory.....	31
2.3 STUDIES TESTING TINTO'S MODEL.....	40
2.3.1 Studies testing Tinto's theory in residential institutions.....	42
2.3.2 Studies testing Tinto's theory in commuter institutions.....	80
2.3.3 Studies testing Tinto's theory across different types of institutions.....	95
2.4 STUDIES IN SAUDI ARABIA	120
2.5 CONCLUSION	122
CHAPTER 3 - RESEARCH DESIGN AND METHODOLOGY	124
3.1 INTRODUCTION	124
3.2 AIM AND OBJECTIVES.....	124
3.3 RESEARCH PARADIGM.....	125
3.3.1 Positivism paradigm.....	125
3.3.2 Constructivism paradigm	126
3.3.3 Pragmatism paradigm.....	126
3.4 RESEARCH METHODOLOGY	127
3.4.1 Quantitative approach.....	127
3.4.2 Qualitative approach.....	128
3.4.3 Mixed methods approach	129
3.5 RESEARCH DESIGN	133
3.6 THE SETTING.....	135
3.7 QUANTITATIVE APPROACH.....	137
3.7.1 The model and hypotheses.....	137
3.7.2 Data collection methods and participants.....	140
3.7.3 Constructs and their measures	145
3.7.4 Data analysis.....	147
3.8 QUALITATIVE APPROACH.....	156
3.8.1 Data collection methods and participants.....	156
3.8.2 Data analysis procedures.....	164
3.8.3 Measures to ensure trustworthiness	169
3.9 CONCLUSION	171

CHAPTER 4 -	QUANTITATIVE DATA ANALYSIS.....	172
4.1	INTRODUCTION	172
4.2	PARTICIPANTS AND POPULATION	172
4.3	DATA PREPARATION AND DATA SCREENING.....	174
4.3.1	<i>Missing values</i>	175
4.3.2	<i>Outliers</i>	177
4.3.3	<i>Normality of distribution</i>	179
4.3.4	<i>Sample size</i>	180
4.4	MEASUREMENT MODELS.....	183
4.4.1	<i>Confirmatory factor analysis for Initial and Later Goal and Institutional Commitments</i>	186
4.4.2	<i>Confirmatory factor analysis for Social Integration</i>	190
4.4.3	<i>Confirmatory factor analysis for Academic integration</i>	197
4.5	STRUCTURAL MODEL	200
4.5.1	<i>Analysis of structural models</i>	200
4.5.2	<i>Hypotheses testing</i>	211
4.6	CONCLUSION	217
CHAPTER 5 -	QUALITATIVE DATA ANALYSIS.....	218
5.1	INTRODUCTION	218
5.2	PARTICIPANTS CHARACTERISTICS	218
5.3	FACTORS AFFECTING STUDENT RETENTION AS PERCEIVED BY NON-PERSISTER, PERSISTER STUDENTS, AND STAFFS.....	222
5.3.1	<i>Non-persister students</i>	222
5.3.2	<i>Persister students</i>	224
5.3.3	<i>Staff members</i>	225
5.4	EXAMINING TINTO'S CONSTRUCTS FROM BOTH NON-PERSISTER AND PERSISTER STUDENTS.....	227
5.4.1	<i>Background characteristics</i>	227
5.4.2	<i>Initial Goal and Institutional Commitments</i>	228
5.4.3	<i>Academic Integration</i>	232
5.4.4	<i>Social Integration</i>	238
5.5	CONCLUSION	242
CHAPTER 6 -	DISCUSSION.....	244
6.1	INTRODUCTION	244
6.2	SUMMARY OF THE QUANTITATIVE AND QUALITATIVE RESULTS	244
6.3	DISCUSSION OF THE FINDINGS	250
6.3.1	<i>The effects of students background characteristics</i>	251
6.3.2	<i>The effects of students' initial goal and institutional commitments</i>	253
6.3.3	<i>The effects of students' levels of academic and social integrations</i>	254
6.3.4	<i>The effects of students' later goal and institutional commitments</i>	255
6.4	OTHER FINDINGS FROM QUALITATIVE DATA	257
6.5	CONCLUSION	262
CHAPTER 7 -	SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.....	264
7.1	INTRODUCTION	264
7.2	PURPOSE OF THE STUDY	264
7.3	OVERVIEW OF THE METHODOLOGY	266
7.4	MAJOR FINDINGS	267
7.5	LIMITATIONS.....	271
7.6	RECOMMENDATIONS FOR PRACTICE.....	271
7.7	RECOMMENDATIONS FOR FURTHER RESEARCH	277
REFERENCES	282	
APPENDICES	296	
APPENDIX A: PERMISSION LETTER FROM KING SAUDI UNIVERSITY	297	

APPENDIX B: THE TWO QUESTIONNAIRES IN ENGLISH AND ARABIC	299
APPENDIX C: TELEPHONE INTERVIEW AND FOCUS GROUP INTERVIEW GUIDE IN ENGLISH AND ARABIC.....	306
APPENDIX D: STAFF SURVEYS IN ENGLISH AND ARABIC	309
APPENDIX E: LIST OF WITHDRAWN STUDENTS.....	314
APPENDIX F: INFORMED CONSENT FORM.....	316
APPENDIX G: THE FREQUENCY HISTOGRAMS AND THE NORMALITY PLOTS FOR EACH VARIABLE.....	321

List of Tables

TABLE 2.1 AGGREGATED MAGNITUDE OF SUPPORT FOR EACH PROPOSITION BY MULTIPLE AND SINGLE INSTITUTIONAL TESTS	113
TABLE 2.2 MAGNITUDE OF SUPPORT FOR EACH PROPOSITION BY INSTITUTIONAL TYPE: MULTIPLE INSTITUTIONAL TESTS	117
TABLE 2.3 MAGNITUDE OF SUPPORT FOR EACH PROPOSITION BY INSTITUTIONAL TYPE: SINGLE INSTITUTIONAL TESTS	117
TABLE 3.1 INSTITUTIONAL INTEGRATION SCALES' ITEMS (PASCARELLA AND TEREZINI, 1980, PP 66-67)	142
TABLE 4.1 COMPARISONS BETWEEN THE PARTICIPANTS AND THE POPULATION	174
TABLE 4.2 THE DISTRIBUTION OF THE NUMBER OF MISSING VALUES ON EACH CASE	175
TABLE 4.3 THE NUMBER OF MISSING VALUES BY VARIABLES	176
TABLE 4.4 DESCRIPTIVE STATISTICS FOR THE VARIABLES USED IN THE MODEL (N=391).....	182
TABLE 4.5 STANDARDIZED RESIDUAL COVARIANCES (FINAL MODEL)	189
TABLE 4.6 CFA FOR INITIAL AND LATER GOAL AND INSTITUTIONAL COMMITMENTS.....	190
TABLE 4.7 STANDARDIZED RESIDUAL COVARIANCES (FINAL MODEL)	194
TABLE 4.8 CFA FOR SOCIAL INTEGRATION	194
TABLE 4.9 STANDARDIZED RESIDUAL COVARIANCES (FINAL MODEL)	198
TABLE 4.10 CFA FOR ACADEMIC INTEGRATION.....	198
TABLE 4.11 TOTAL, INDIRECT, AND DIRECT EFFECTS AMONG LATENT VARIABLES	210
TABLE 4.12 SUMMARY OF HYPOTHESES TESTING	216
TABLE 5.1 NON-PERSISTER STUDENTS' DEMOGRAPHIC CHARACTERISTICS	219
TABLE 5.2 PERSISTER STUDENTS' DEMOGRAPHIC CHARACTERISTICS	221
TABLE 5.3 COMPARISONS BETWEEN THE PARTICIPANTS AND THE POPULATION	222
TABLE 5.4 VARIABLES PERCEIVED FROM NON-PERSISTER STUDENTS TO AFFECT STUDENT RETENTION AT KSU WITH FREQUENCY AND PERCENT OF SAMPLE.....	223
TABLE 5.5 VARIABLES PERCEIVED FROM PERSISTER STUDENT TO AFFECT STUDENT RETENTION AT KSU WITH FREQUENCY AND PERCENT OF SAMPLE	224
TABLE 5.6 VARIABLES PERCEIVED FROM STAFF MEMBERS TO AFFECT STUDENT RETENTION AT KSU WITH FREQUENCY AND PERCENT OF SAMPLE	226
TABLE 6.1 FACTORS AFFECTING STUDENT RETENTION AT KSU.....	258

List of Figures

FIGURE 2.1 SPADY (1970) THEORY OF STUDENT DEPARTURE, SPADY (1970, P.79).....	18
FIGURE 2.2 TINTO (1975) STUDENT INTEGRATION THEORY, TINTO (1975, P. 95).....	21
FIGURE 2.3 TINTO'S REVISED THEORY, TINTO (1993, P. 114)	25
FIGURE 2.4 PASCARELLA'S (1980) ATTRITION THEORY, PASCARELLA (1980, P. 569).....	27
FIGURE 2.5 BEAN AND METZNER'S (1985) STUDENT ATTRITION THEORY, BEAN ET AL., (1985, P. 491).....	30
FIGURE 2.6 CABRERA'S (1992) INTEGRATED RETENTION THEORY, CABRERA <i>ET AL.</i> , (1993, P. 128).....	36
FIGURE 2.7 PATH DIAGRAM OF TINTO MODEL	41
FIGURE 2.8 A PATH DIAGRAM OF THE IMPACT OF ATTENDING ORIENTATION PROGRAM WITHIN TINTO MODEL	58
FIGURE 2.9 A PATH DIAGRAM OF THE IMPACT OF INVOLVEMENT WITHIN TINTO MODEL	60
FIGURE 2.10 A PATH DIAGRAM OF THE IMPACT OF LIFE TASK WITHIN TINTO MODEL	63
FIGURE 2.11 A PATH DIAGRAM OF THE IMPACT OF STUDENT SOCIAL STRUCTURE WITHIN TINTO MODEL	66
FIGURE 2.12 STRONGLY SUPPORTED PROPOSITIONS (BRAXTON <i>ET AL.</i> , 1997, P. 155)	69
FIGURE 2.13 A PATH DIAGRAM OF THE IMPACT OF SENSE OF COMMUNITY WITHIN TINTO MODEL	70
FIGURE 2.14 A PATH DIAGRAM OF THE IMPACT OF ORGANIZATIONAL ATTITUDES WITHIN TINTO MODEL	72
FIGURE 2.15 A PATH DIAGRAM OF THE IMPACT OF COPE WITH STRESS WITHIN TINTO MODEL	73
FIGURE 2.16 A PATH DIAGRAM OF THE IMPACT OF FACULTY TEACHING SKILLS WITHIN TINTO MODEL	74
FIGURE 2.17 A PATH DIAGRAM OF THE IMPACT OF ACTIVE LEARNING WITHIN TINTO MODEL	76
FIGURE 2.18 A PATH DIAGRAM OF THE IMPACT OF ACADEMIC ADVISING WITHIN TINTO MODEL	88
FIGURE 2.19 A PATH DIAGRAM OF THE IMPACT OF STUDENT PROBLEMS WITHIN TINTO MODEL	90
FIGURE 2.20 A PATH DIAGRAM OF THE IMPACT OF ORGANIZATIONAL ATTRIBUTES WITHIN TINTO MODEL	91
FIGURE 2.21 A PATH DIAGRAM OF THE IMPACT OF STUDENT EXPECTATIONS FOR COLLEGE WITHIN TINTO MODEL	110
FIGURE 2.22 THE PRIMARY PROPOSITIONS DERIVED FROM TINTO'S THEORY (BRAXTON <i>ET AL.</i> , 1997, P. 113)	114
FIGURE 3.1 VISUAL DIAGRAM OF THE CONCURRENT TRIANGULATION STRATEGY USED IN THIS STUDY	136
FIGURE 3.2 INITIAL MODEL OF STUDENT RETENTION.....	139
FIGURE 3.3 COMMON PATH DIAGRAM SYMBOLS.....	151
FIGURE 3.4 THE PROCESS OF DATA ANALYSIS. (CRESWELL, 2002, P. 257).....	165
FIGURE 3.5 CONSTANT COMPARATIVE METHOD. ((MAYKUT AND MOREHOUSE, 1994, P.135).	166
FIGURE 4.1 THE MEASUREMENT MODELS FOR INITIAL AND LATER GOAL AND INSTITUTIONAL COMMITMENTS.....	192
FIGURE 4.2 THE MEASUREMENT MODELS FOR SOCIAL INTEGRATION	196
FIGURE 4.3 THE MEASUREMENT MODELS FOR ACADEMIC INTEGRATION	199
FIGURE 4.4 A PATH DIAGRAM FOR THE INITIAL THEORETICAL MODEL.....	201
FIGURE 4.5 A PATH DIAGRAM FOR THE INITIAL THEORETICAL MODEL.....	203
FIGURE 4.6 A PATH DIAGRAM FOR THE FIRST MODIFIED MODEL.....	205
FIGURE 4.7 A PATH DIAGRAM FOR THE SECOND MODIFIED MODEL	207
FIGURE 4.8 A PATH DIAGRAM FOR THE THIRD AND FINAL MODIFIED MODEL	209

Chapter 1 - Introduction

1.1 The research problem

Student retention in higher education institutions in Saudi Arabia is a major problem (Abdul Jauad, 1998; Almannie, 2002). It is estimated that 35% of university students will leave higher education before completing their studies (Al-Saud, 2006). In order to improve student retention, the Ministry of Higher Education has changed the admission process. Prior to 1999 the main admission criterion was based on high school results. In 1999, another test, named the General Reasoning Test, was introduced. By 1999, the admission criteria were based on the combined results of both high school and the General Reasoning test.

Research on student retention is one of the most widely studied topics in higher education over the past thirty years (Braxton, 2002; Seidman, 2005). Several theories have been developed to explain student retention. The most widely discussed and the most researched is Tinto's (1975, 1993) student integration theory. Berger and Braxton (1998, p. 104) have stated that Tinto's integration model 'has been the focus of much empirical research and has near-paradigmatic status in the study of the college student departure.' However, no study has studied the retention of Saudi students using Tinto's theory. In addition, although the General Reasoning test has been used in the admission process since 1999, no study has examined its usefulness in predicting student success as measured by retention.

1.2 Purpose of the study

The purpose of this study was to identify the factors affecting student retention at King Saud University. This study was guided by Tinto's (1975) student integration theory. This theory is longitudinal and dynamic and views student retention decisions largely as the results of interactions between the student and the academic and social systems of the institution (Tinto, 1975, 1993).

The theory suggests that students enter a particular college or university with a set of background characteristics. These characteristics include family background, individual attributes and pre-college schooling. Family background characteristics include family social status, parental formal educational level, and parental expectations. Examples of individual attributes include academic aptitude, race, age and gender. Pre-college schooling experiences include the characteristics of the student's secondary school, high school academic achievement and academic course work. These student entry characteristics directly influence students' initial goal and institutional commitments. Goal commitment represents the degree to which the student is committed, or motivated, to get a university degree in general; while institutional commitment represents the degree to which the student is motivated to graduate from a specific university (Tinto, 1993).

Initial goal and institutional commitments affect students' degree of integration into the academic and social systems of the university.

Academic integration consists of both structural and normative dimensions. Structural integration involves the meeting of explicit standards of the university, whereas normative integration relates to an individual's identification with the normative structure of the academic system (Tinto, 1975, p.104). Social integration refers to the degree of congruency between the individual student and the social system of a university. Tinto indicates that informal peer group associations, extracurricular activities, and interaction with faculty and administrators are mechanisms of social integration (Tinto, 1975, p.107).

Academic and social integration affect students' later goal and institutional commitments. Moreover, both later commitments are also affected by students' initial levels of commitments. Tinto states that 'in the final analysis, it is the interplay between the individual's commitment to the goal of college completion, and his commitment to the institution that determines whether or not the individual decides to drop out from college' (Tinto, 1975, p.96).

1.3 Overview of the study methodology

This study used a mixed methods approach. Using the terminology of Creswell (2003), the appropriate description of the overall design of this study is a mixed methods concurrent triangulation strategy. This means that 'qualitative and quantitative data are collected and analyzed at the same time. Priority is usually equal and given to both forms of data. Data analysis is usually separate, and integration usually occurs at the data

interpretation stage' (Hanson *et al.*, 2005, p. 229). This strategy was selected because it allows the findings to be confirmed, cross-validated, and corroborated within a single study (Creswell, 2003).

This strategy consisted of two phases. The first phase used a quantitative approach. Quantitative data were collected from 414 freshman students using two questionnaires administered on two occasions and from the university admission office. The quantitative data were analysed through a structural equation modelling (SEM) technique using the AMOS software package.

The second phase of this study drew on a qualitative approach. Qualitative data were obtained from three sources: non-persister students, persister students, and staff members. 17 non-persister students were interviewed over the phone. 15 persister students were interviewed using focus group techniques. Staff members were asked to complete a survey. Of the 200 surveys sent, 37 were returned and completed by 16 lecturers, 12 administrators, 5 librarians, and 4 academic advisers.

1.4 Background of the study

1.4.1 Education in Saudi Arabia

The educational policy in Saudi Arabia is derived from the religion of Islam which is considered as a total system of life. The main principles of education as defined by the document entitled *The Educational Policy in the Kingdom of Saudi Arabia* are: 'Belief in God and in the Message given to the Prophet Muhammad (peace up on him). The Islamic concept of the

universe, of man and of life. The individual citizen has the duty of the pursuit of learning, and the state's duty is to provide learning for its citizens. Muslim women are entitled to education commensurate with their natural inclinations, and on equal footing with men. Education, throughout its various stages, is connected with the General Development Plan of the state. Arabic is the language of education in all of its stages' (Ministry of Education, 2004, p.6).

Education is financed through the state budget, and it is free and segregated by sex at all levels. In addition, university students receive a monthly allowance. There are three main authorities in charge of education: the Ministry of Education, the General Establishment of Technical Education and Vocational Training, and the Ministry of Higher Education. In addition, other ministries and public organizations have authority over certain types of educational institutions such as those operated by the Ministry of Health and the Ministry of Defence.

The Ministry of Education is in charge of general education, special education, and adult education and literacy. It was established in 1952 and was known as the Ministry of Educational Disciplines. General education consists of six years of primary school and three years each of secondary and high school. Formal education in Saudi Arabia is a relatively recent development when compared to other countries in the region. Elementary education began in the 1920s, secondary and high school education was introduced in the early 1940s (Al-Hougail, 1998).

Student enrolment has increased rapidly each year at all levels of general education. During the period from 1967 to 2003, the number of students enrolled in general education levels increased from 400,400 to 4.3 million students (Ministry of Economic and Planning, 1970, 2005).

The General Establishment of Technical Education and Vocational Training was established in 1980. It is the principal government agency that provides technical education and vocational training in its technological colleges, vocational secondary schools, and vocational training centers. It also supervises education and training programs which are provided by a number of government and private agencies.

The main objectives of technical education and vocational training are to prepare and train individuals to perform the required industrial, commercial, agricultural and services activities that contribute to the national economy; to provide the individual with the Islamic values and general knowledge that help them adopt a good way of thinking and adjust to different environments; to create a scientific base of technical manpower that can easily deal with the rapid development in technology; to provide opportunities for individuals who desire to learn a profession or continue training to the highest level that his mental and physical capabilities allow; to develop the skills of technicians and update their professional information on a continuing base; to underline the importance of handicraft and vocational work and their role in the prosperity of the society; and, to contribute to a decline in the movement of citizens to big

cities by opening vocational training centres in all Saudi's regions (Alkhteb, 1998).

In 2004 there were 24 technological colleges with a total enrollment in these colleges of 39,500 students. Vocational Secondary schools provide 3-year vocational education programmes to intermediate school graduates in the fields of agriculture, industry, trade and technical supervision. In 2004 there were 34 vocational secondary schools with a total enrolment of 23,700 students. In 2004, there were 34 vocational training centres. The number of trainees enrolled was 13,500 (Ministry of Economic and Planning, 2005).

The Ministry of Higher Education, established in 1975, is in charge of implementing the policies of Saudi in the field of higher education. The main goals and objectives of higher education are to emphasize the students' loyalty to Almighty God, and hence provide the best Islamic education; to prepare citizens qualified to do their duty in serving their country and lead it to progress in light of the ideals of Islamic principles; to provide opportunities for the gifted to stand out in their education in all fields; to play a positive role in research which concentrates on the development of the world in the field of arts and science; to find solutions to the technological obstacles faced by society; to encourage translation of the sciences and all useful knowledge to Arabic; to provide training services for working students to develop themselves; to encourage authorship of books which will serve science and enable the country to

play a leading role in building human civilization based on the ideals of Islamic tolerance; and, to guide the human race along the right path and save human kind from any material or unethical tendency (Abdul-Jauad, 1998; Al-Hougail, 1998; Ministry of Education, 2004).

In 2007, there were fourteen government universities, three private universities, thirteen private colleges, ten community colleges, eighteen teachers' colleges, and one hundred and two girls' colleges (Ministry of Higher Education, 2007). The number of male and female students enrolled at the bachelor level increased from 282,433 in 1999 to 366,344 in 2003, at an average annual growth rate of 6.7 percent. The number of graduates at the bachelor level grew to 53,000 students, compared with 38,000 between 1999 and 2003, representing an average annual growth rate of around 9%. It is estimated that the number of graduates will increase to more than 132,000 students by 2009 (Ministry of Economic and Planning, 2005).

Higher education in Saudi Arabia is facing difficulties in meeting rising demands to admit more students (Alkhazim, 2003). In 2003, the number of high school graduates was 223,703. About 57% (126,752) of them were admitted to higher education institutions. It is estimated that 243,000 students will graduate from high schools in 2009 and only 160,000 of them will be able to pursue higher education (Alkhazim, 2003; Ministry of Economic and Planning, 2005).

1.4.2 Admission to higher education

The admission criteria of higher education institutions have changed over time. Prior to 1999, the only main admission criterion for both males and females was the results of high school tests. In addition, some universities used their own admission criteria such as tests and interviews. In 1999, the National Assessment and Evaluation Centre was established. The main purpose of this centre was to produce and administer two standardized tests: the General Reasoning Test and Subject Tests. Since 1999, selection has been decided on the basis of a composite score weighted 70/30 on high school and general reasoning scores respectively. A limited number of departments such as medicine and engineering use Subject Tests as additional criteria. The General Reasoning test is applied only to male students although it is planned to apply it to female students. Students apply to a department within a university and they are placed in rank according to their composite scores, and cut-off points are then established according to their abilities and the availability of places. For some departments minimum cut-off points may be set regardless of the quota to be selected to ensure that students meet basic requirements.

The determinants of using standardized tests in admission to higher education include the increasing numbers of high school graduates wishing to enrol given the limited capacity of higher education; an increase in attrition rates in universities; the increasing percentage of failed students who accordingly will spend more years to graduate; the decrease in the educational efficiency of the universities; and escalating numbers of

students who transfer among majors within and among different universities (National Assessment and Evaluation Centre, 2003).

The objectives of using standardized tests on a national level are to systematize the content, method, and objectives of admission criteria and to minimize individual and inappropriate interventions by different universities; to eliminate the expense of admission tests conducted in each individual university; to increase objectivity and fairness in selecting students to university; to predict student success in university; and, to employ different admission criteria other than high school results (National Assessment and Evaluation Centre, 2003).

The General Reasoning test is a three-hour multiple choice test and is written in the Arabic language. It is designed and administered by the National Assessment and Evaluation Centre. It is administered twice a year at thirty eight centres throughout Saudi Arabia and students may take it more than once. However, there is a charge each time the test is taken. The test consists of two sections: verbal reasoning and quantitative reasoning. The question types in the verbal section of the General Reasoning test consists of: sentence completions measuring logical relationships among parts of a sentence; antonyms measuring knowledge of vocabulary; analogies measuring reasoning skills and knowledge of vocabulary; and, reading comprehension which assesses inference, the application of logic, and questions relating to the main idea of the passage. The question types in the quantitative section include algebraic

problems and equations, and geometric problems. Only basic knowledge of maths is needed to solve these questions and any explanations or formulae that may be required are provided in the test booklet.

1.5 Significance of the study

This study is important for several reasons. First, this study will contribute to the literature concerned with student retention. Although a large number of studies have examined factors affecting student retention in higher education, there is currently no study which has examined the retention of Saudi students.

Second, this study will be beneficial to the Saudi government. The provision of higher education in Saudi Arabia is free and in addition university students receive monthly rewards or grants. It was estimated that on average each university student costs 30,000 Saudi Riyals per year (\$ 8,011) (Aldaban, 2007). Therefore, helping students to persist in their studies will improve the efficiency of the HE system.

Third, this study will be beneficial to the Ministry of Higher Education by providing empirical evidence concerning the validity of the admission criteria in predicting student retention. Prior to 1999, as noted above, the main admission criterion to select students to higher education was based mainly on results gained in high school. By 1999, the General Reasoning Test had been introduced to the selection process. There are currently no studies which have examined the predictive validity of this test in assessing student success as measured by retention.

Fourth, this study may be beneficial to staff and faculty at King Saud University as it may give them a clearer picture of the factors affecting student retention and thus allow them to develop programmes that aim to prevent students from dropping out. Finally, the study may be beneficial to future students and their parents since it will provide evidence of the best predictors of student retention.

1.6 Organization of the thesis

This thesis has been constructed in seven chapters. Chapter One provides an introduction to the problem, the purpose of the study, and its significance. Chapter Two provides a review of related literature to the study. Chapter Three presents the methodology used and provides some justification for the methods adopted. Chapter Four gives a detailed analysis of the quantitative data; while Chapter Five presents the analysis of the qualitative data. Chapter Six combines the findings from the quantitative and qualitative results; while Chapter Seven, the final chapter, summarises the conclusions of this research and provides recommendations for further study.

1.7 Definitions of key terms

The following terms are used in this study:

Retention - refers to students who enrolled at a university and stayed there until they graduated. In this study, it was measured as whether or not students returned for the second year.

Social integration – refers to the degree of congruency between the individual student and the social system of a university (Tinto, 1975). Examples of social integration are informal peer group associations, extracurricular activities, and interaction with faculty and administrators.

Academic integration – consists of structural and normative dimensions. Structural integration involves the meeting of explicit standards of the university, whereas normative integration relates to an individual's identification with the normative structure of the academic system (Tinto, 1975, p. 104).

Goal commitment – refers to the degree to which the student is committed or motivated to get a university degree in general (Tinto, 1993).

Institutional commitment – refers to the degree to which the student is motivated to graduate from a specific university (Tinto, 1993).

Chapter 2 - Review of the Literature

2.1 Introduction

This chapter presents a review of the literature on student retention. It is divided into three sections. The first presents an overview of the leading theories relevant to student retention; the second covers the studies testing the predictive validity of Tinto's theory; and, the final section covers the studies conducted in Saudi Arabia related to predicting student academic success and retention.

2.2 Student retention theories

Factors affecting student retention in higher education have been the subject of an enormous amount of research over seven decades (Braxton, 2002). Several theories of student retention have been developed by researchers to identify and analyze the factors affecting student retention, and the majority of these derive from studies within the US higher education system. Tinto (1993) has categorized student retention theories into three types: psychological, environmental, and interactional. Psychological theories focus on individual personality attributes and view student attrition as reflecting some shortcoming and/or weakness in the individual. However, there is no "departure-prone" personality or any other personal characteristics which are uniformly associated with student attrition (Tinto, 1993). The key theories in this category are Astin's (1984) Student Involvement Theory and Bean and Eaton's (2000) Psychological Theory.

Environmental theories focus on the social, economic, and organisational forces impacting on student retention (Tinto, 1993). Societal theories emphasize the importance of social forces that are external to the higher education institution on student retention such as social status, race, prestige, and opportunity (Tinto, 1993). As a result, they are insensitive to individual and institution specific forces that affect student retention decisions. Economic theories emphasize the importance of individual finances and financial aid in student retention (Tinto, 1993). However, there is little empirical evidence to support the connection that financial forces are primary influences for most students' retention decisions (Tinto, 1993). Tinto (1993) argues that financial factors tend to be of secondary importance to the decisions of most students. He suggests two reasons for this; firstly, the effect of finance on retention is more influential in decisions concerning college entry rather than decisions concerning college retention (e.g., whether to attend; where and when to attend; and in what form to attend, i.e., part- or full-time). Secondly, though students frequently mention financial reasons for leaving, their main reasons often are other factors not associated with finances. When students have a positive experience at university, they are often more likely to cope with financial problems in order to continue their study. Organisational theories focus on the effect of organisational factors on student retention. Factors studied within these theories include bureaucratic structure and size, faculty-student ratios, and institutional resources and goals. Organisational theories are useful in explaining student retention between higher

education institutions. However, they are less useful in explaining student retention within institutions (Tinto, 1993). The key theory in this category is Bean and Metzner's (1985) Student Attrition Theory.

Interactional theories focus on the influence of the interaction of individual and environmental factors on student retention. Tinto's (1975, 1993) Student Integration Theory is the key theory in this category.

This review of the literature examines six of the most widely tested theories of student retention. These are Spady's (1970) Student Departure Theory, Tinto's (1975, 1993) Student Integration Theory, Pascarella's (1980) Attrition Theory, Astin's (1984) Student Involvement Theory, Bean and Metzner's (1985) Student Attrition Theory, and Cabrera's (1992) Integrated Retention Model.

2.2.1 Spady's (1970) Theory of Student Departure

Spady proposed the first theory of student retention in higher education. Spady's (1970) theory of student departure is based upon Durkheim's (1951) theory of suicide. Durkheim concluded that suicidal behaviour was the result of the inability to integrate socially and intellectually into society. Spady (1970) postulated that the same process occurs when students drop out from university. Students who did not socially integrate in the university system were more likely to leave university.

According to Spady's theory, presented in Figure 2.1, family background affects a student's academic potential as well as a student's normative congruence. The student's normative congruence 'represents not only all

of the student goals, orientations, interests, and personality dispositions... but the consequences of the interaction between these attributes and various subsystems of the college environments as well' (Spady, 1970, p. 78). The student's academic potential in turn affects grade performance and intellectual development, while the student's normative congruence affects grade performance, intellectual development, and friendship support. Normative congruence, grade performance, intellectual development, and friendship support all affect the student's social integration. This affects the student's satisfaction with university, which in turn affects the student's commitment to the institution. Consequently, the student's level of institutional commitment has a direct effect on the student's decision to stay or leave university. Grade performance has a direct effect on the drop-out decision because a student who has poor grade performance may be dismissed for academic reasons. In addition, the student's institutional commitment has a direct effect on the student's normative congruence by altering goals, motivation or interests.

Spady (1971) tested the predictive validity of his model. The data were obtained from 683 first-year students enrolled at the University of Chicago between 1965 and 1970. Using multiple regression analysis, the results indicated that over a four-year period the dominant predictor of student

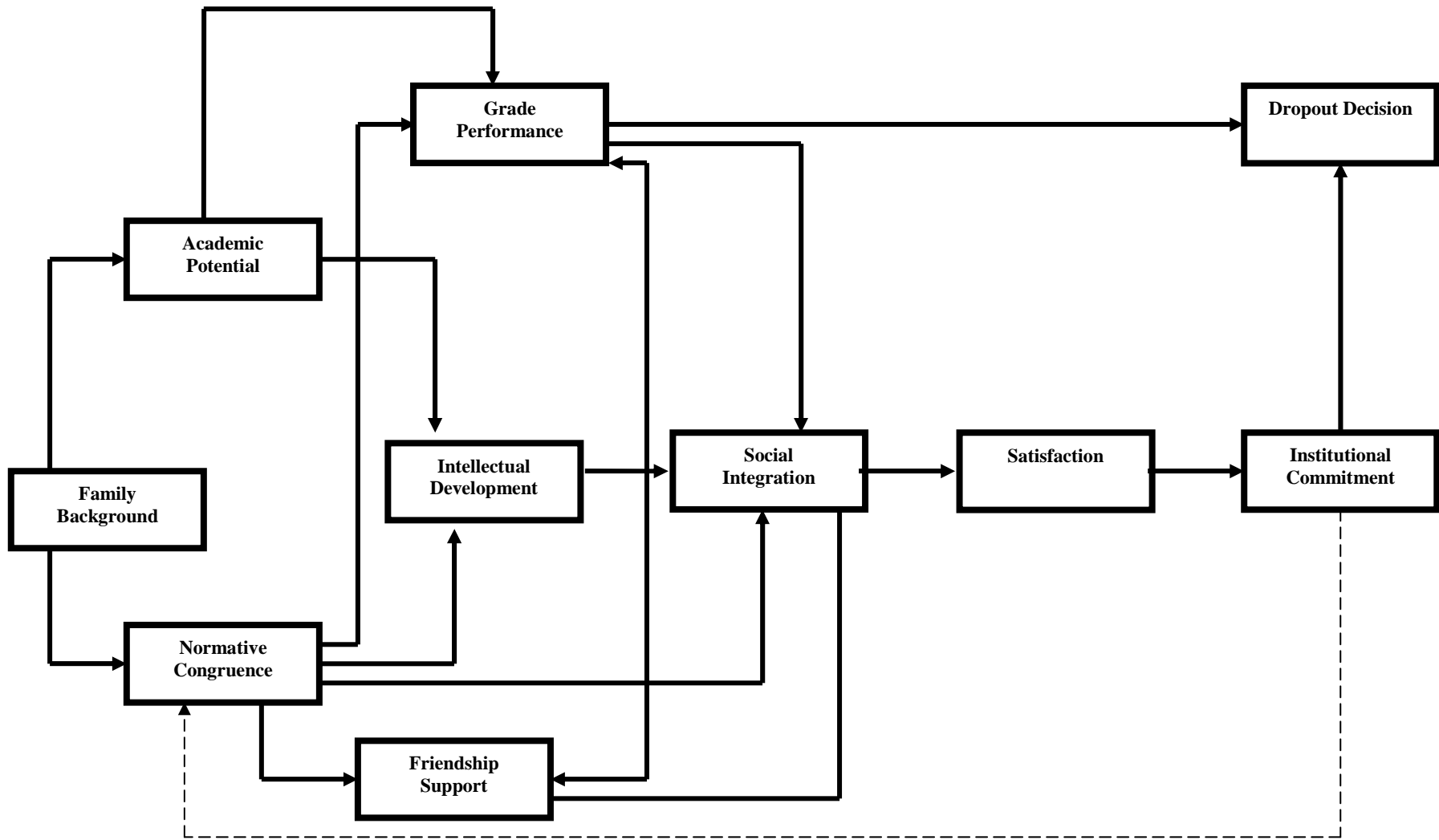


Figure 2.1 Spady (1970) Theory of Student Departure, Spady (1970, p.79)

retention for male and female students was academic performance. In addition, the results indicated significant differences between male and female students. For male students, academic performance was the most influential predictor of student retention, followed by institutional commitments. For female students, the situation was reversed, with institutional commitment being the most influential predictor of student retention, followed by academic performance.

2.2.2 Tinto's (1975) Student Integration Theory

Tinto's (1975) Student Integration Theory is the most widely discussed and most researched model of student retention. Berger and Braxton (1998, p. 104) have stated that Tinto's integration model 'has been the focus of much empirical research and has near-paradigmatic status in the study of the college student departure.' Tinto's theory is based upon Durkheim's (1951) theory of suicide and Spady's theory of departure. Tinto's Theory is a longitudinal process and regards student retention as the degree to which a student becomes integrated into the social and academic life of the college or university (Tinto, 1993; Rendon, Jalomo, and Nora, 2000). Academic integration is defined a student's perceived academic performance and intellectual development while social integration is defined as the quality of a student's relationships with both the peer group and the faculty (Pascarella and Terenzini, 1980). Tinto (1993) points out that both types of integration do not need to be equal but some level of academic and social integration must occur in order for

students to persist at the college or university. In addition, Tinto also points out that both types of integration may have a reciprocal relationship. For example, if a student is very connected in the academic life by spending too much of his time in study then the student may have a lack of social integration in the university. As a result, this may have a negative consequence with regard to student retention.

According to Tinto's (1975) theory, presented in Figure 2.2, students enter university with a set of background characteristics including: family backgrounds (e.g., family social status, parental formal education, and parental expectations); individual attributes (e.g., gender, race, age, and academic aptitude); and, pre-college schooling (e.g., high school achievement, academic course work). These background characteristics combine to influence the initial goal and institutional commitments that the student brings to the university environment. Goal commitments represent the degree to which the student is committed, or motivated, to get a university degree in general. Institutional commitments represent the degree to which the student is motivated to graduate from a specific university. These commitments change during the student's time at university as a result of the degree of integration into the academic and social systems of the university. In turn, these two types of integration lead to new levels of goal and institutional commitments. In addition, the student's initial goal and institutional commitments influence their later goal and institutional commitments. Tinto states that 'in the final analysis, it is the interplay between the individual's commitment to the goal of

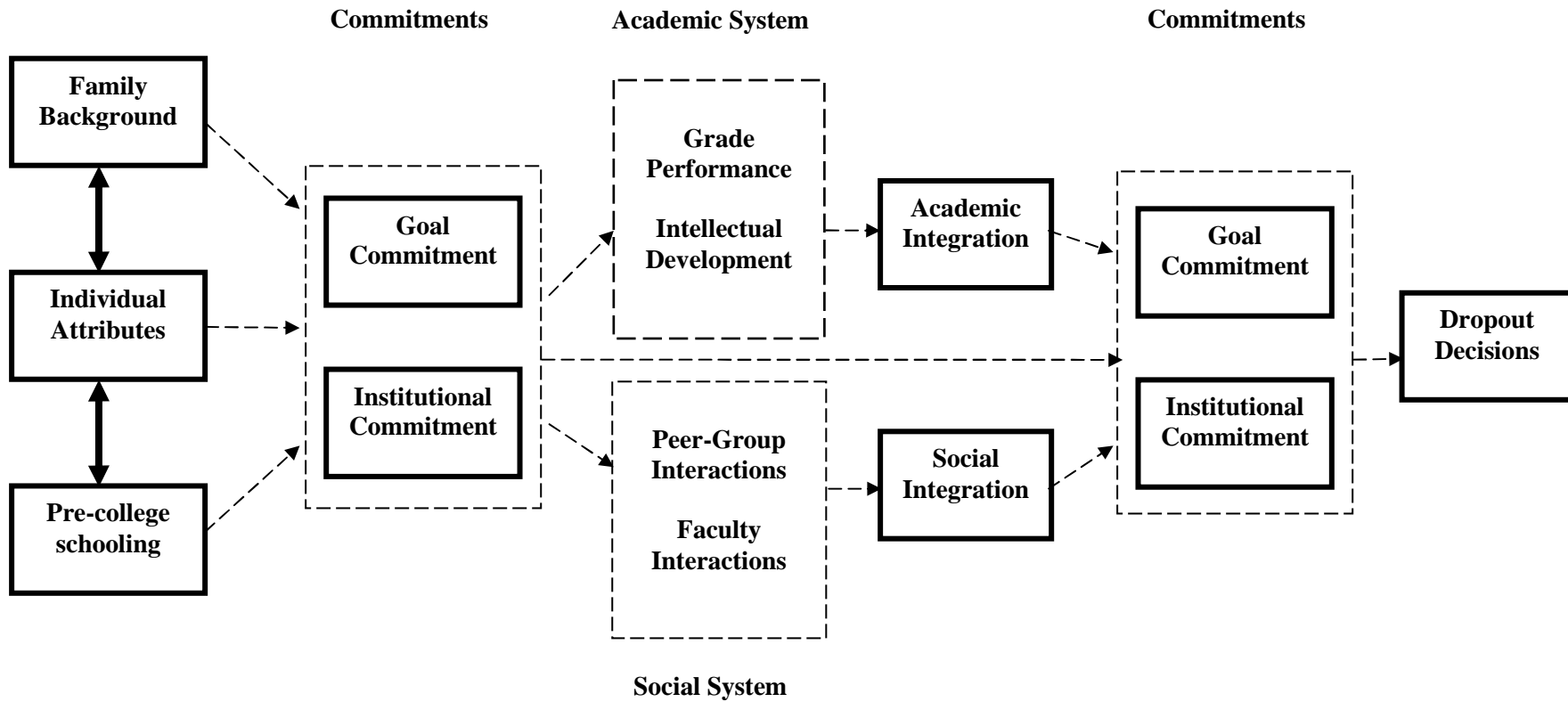


Figure 2.2 Tinto (1975) Student Integration Theory, Tinto (1975, p. 95)

college completion, and his commitment to the institution that determines whether or not the individual decides to drop out from college' (Tinto, 1975, p.96).

To describe the complex process of student integration, Tinto (1993) applies Van Gennep's theory about rites of passage and its three stages of separation, transition, and incorporation. Van Gennep's (1960) theory is concerned specifically with societal change over time and how individuals foster stability in terms of change. In his classic study, *The Rites of Passage*, Van Gennep argues that the transmission of relationships is marked by three separate stages: separation, transition, and incorporation. Tinto (1988) states that 'the point of referring to the work of Van Gennep is that it provides us with a way of thinking about the longitudinal process of student persistence in college and by extension the time-dependent process of student departure' (Tinto, 1988, p.442). He suggests that students leave university when their rites of passage are incomplete.

The first stage of the college student experience is separation. It requires students to disassociate themselves physically and socially from their previous communities such as high school friends, family, and place of residence. These previous communities often have different values, norms, and behavioural and intellectual styles than university. As a result, there must be some degree of transformation and possibly rejection of the norms of previous communities in order for the students to successfully integrate into the norms of the university community. Students who attend

a local, non-residential university may not have to disassociate themselves completely from previous communities but they may not be able to fully integrate academically and socially into the new university community (Tinto, 1988, 1993).

The second stage of the student experience is transition. It comes either during or after the separation stage. It is the stage where students find themselves separated from their previous communities but have not yet fully adapted to the university community. Many students voluntarily withdraw from university during this stage because they cannot cope with the many stresses of transition. However, a student's goals and institutional commitment play an important role in this stage. If the student is committed to the goal of education and to the university, then he can overcome the stresses of transition (Tinto, 1988).

The last stage is incorporation. It can only happen when students have passed through the stages of separation and transition which tend to occur early in the student's experience. In this stage, the students are expected to become integrated or incorporated into the university community. However, unlike incorporation into traditional societies, students are often not provided with formal rituals and ceremonies to connect them to the university community. It is important for the university to provide a variety of formal and informal mechanisms to connect students to the university community, including residence hall associations, student organizations, extracurricular programs, and faculty lectures (Tinto, 1993).

Although Tinto's theory has been widely used to study student retention, it is not without limitations. The theory neglects the role of finance on student retention (Bean and Metzner, 1985; Cabrera *et al.*, 1992; St. John *et al.*, 2002). It fails to distinguish between factors leading students to transfer rather than dropout (Tinto, 1982; Pascarella and Terenzini, 1983). In addition, it fails to incorporate the important differences in educational career paths for students of different race, gender, and social background (Tinto, 1982).

Tinto modified his original theory in 1993 (Figure 2.3) with the addition of two constructs or factors: External Commitments and Intentions. According to Tinto (1993), a student's intentions have a direct influence on their goal and institutional commitment, which both directly influence student retention. External commitments such as families, neighbourhoods, peer groups and work environments can also have a direct influence on student's initial goal and institutional commitments.

2.2.3 Pascarella's (1980) Attrition Theory

Pascarella's (1980) Attrition Theory is based upon Spady (1970), Astin (1970), and Tinto (1975). His theory emphasises the informal interactions between student and faculty as being important in students' educational outcomes and retention. According to Pascarella (1980):

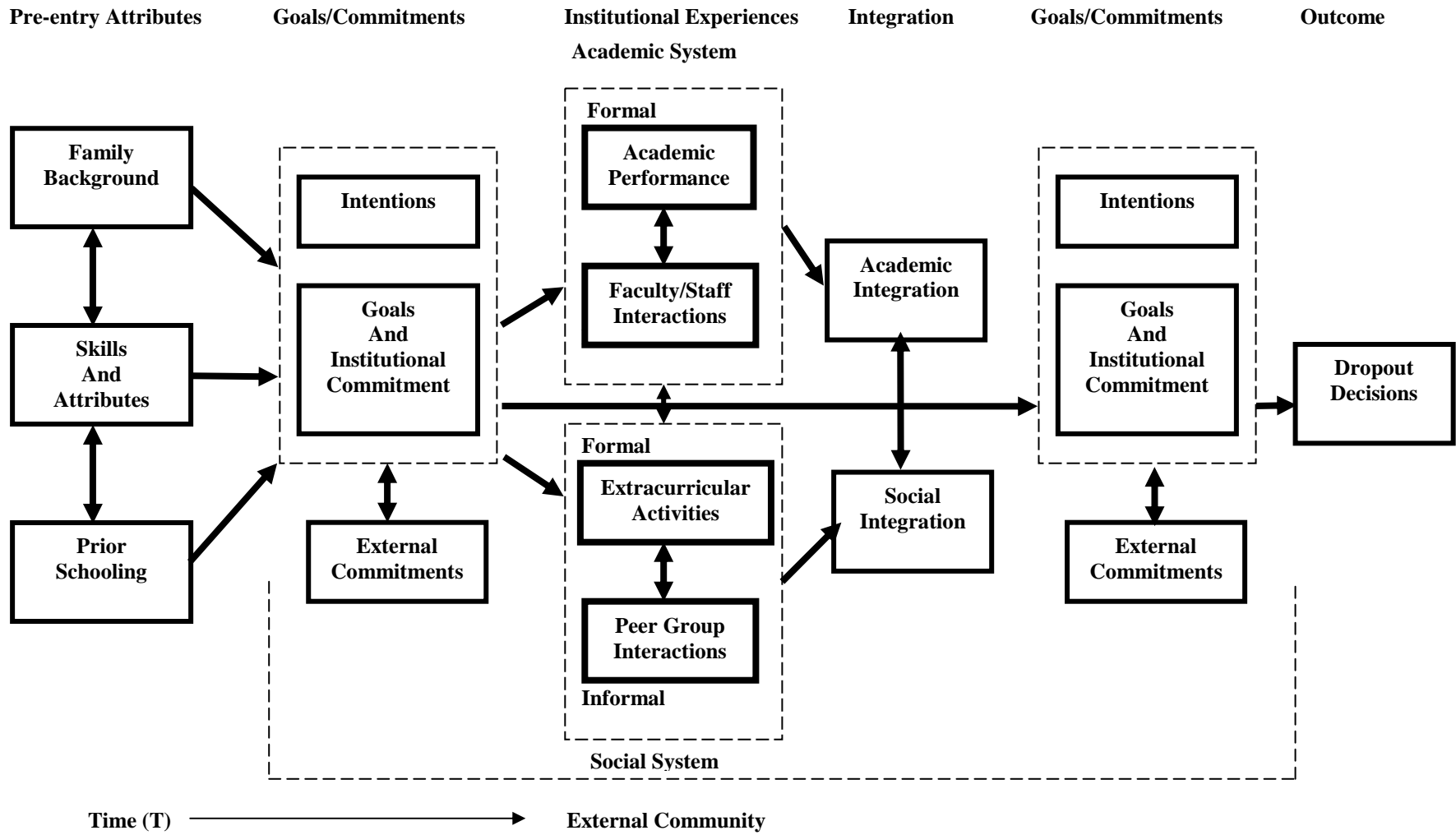


Figure 2.3 Tinto's Revised Theory, Tinto (1993, p. 114)

'In order to understand the unique influence of student-faculty non-classroom contact on educational outcomes and institutional persistence, it is necessary to take into account, not only background characteristics which students bring to college, but also actual experiences of college in other areas, as well as salient institutional factors.' (Pascarella, 1980, p.568)

According to Pascarella's theory, presented in Figure 2.4, student characteristics, institutional characteristics and three independent variables influence each other. The three independent variables include informal contact with faculty, other college experiences, and educational outcomes. The three independent variables reciprocally affect each other so that a problem in one area may affect another area. Only educational outcomes have a direct influence on student retention decision. All other variables affect the persistence/withdrawal decision indirectly through their affect on educational outcomes. However, Pascarella's theory has been criticized because it was developed from a study of a single institution.

2.2.4 Astin's (1984) Student Involvement Theory

Astin's (1984) Student Involvement Theory simply states that students learn by becoming involved. It emphasizes that the factors important to student development were synonymous with the factors important to student retention in terms of the degree to which a student was involved in the institution. Astin (1984) defined student involvement as:

'The amount of physical and psychological energy that the student devotes to the academic experience. Thus a highly involved student is one who, for example, devotes considerable energy to studying, spends much time on campus, participates actively in student organizations, and interacts frequently with faculty members and other students.' (Astin, 1984, p. 297)

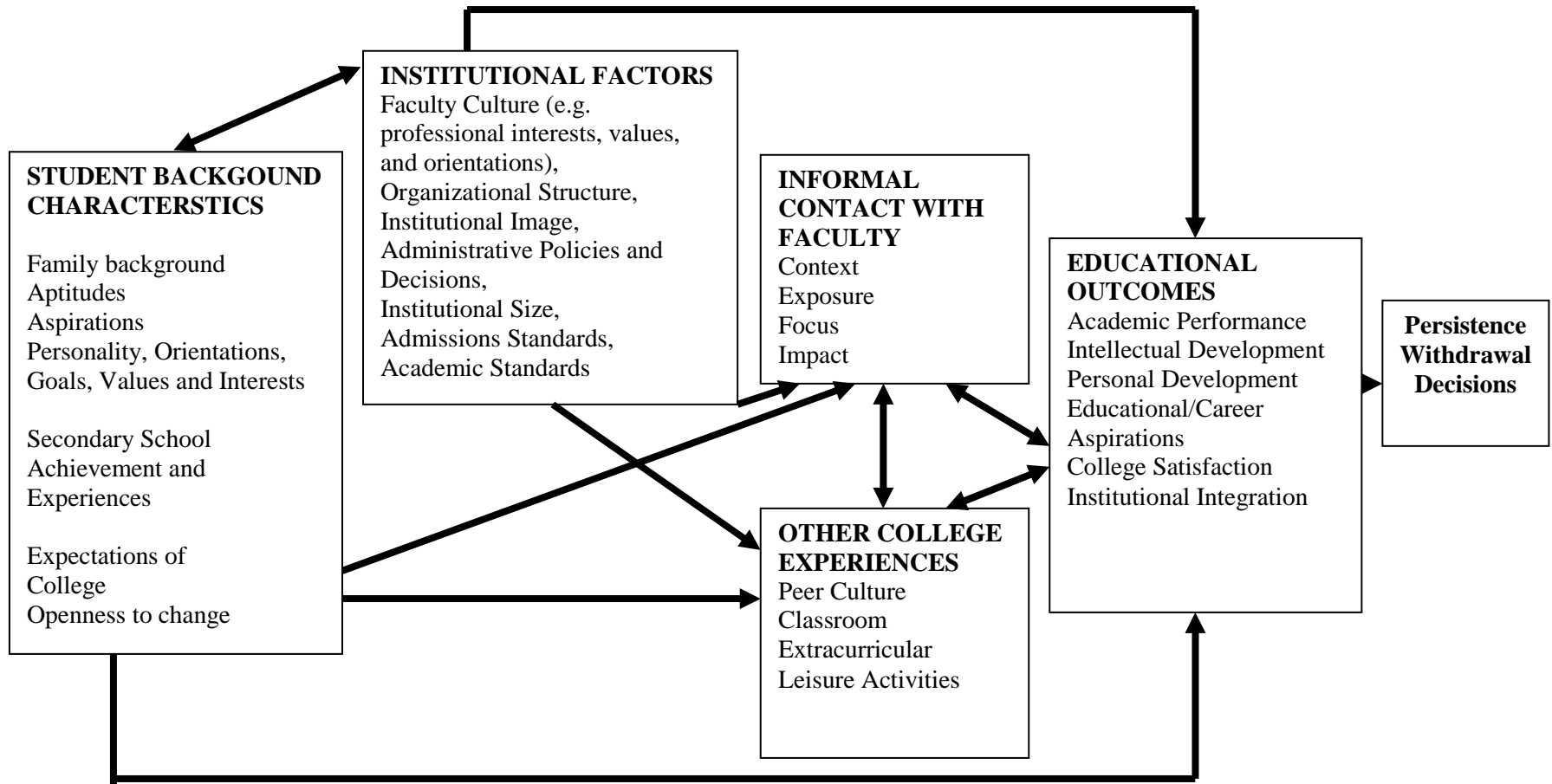


Figure 2.4 Pascarella's (1980) Attrition Theory, Pascarella (1980, p. 569)

Astin's (1984) student involvement theory contains five basic postulates. First, involvement requires the investment of physical and psychological energy in various objects. These objects may be highly generalized or highly specific. Second, involvement is a continuous concept where different students invest different amounts of energy in various objects at various times. Third, involvement includes quantitative (e.g., the numbers of hours a student spends studying) and qualitative (e.g., the amount of learning that takes place during study time) components. Fourth, the amount of student learning and development is directly proportional to the quality and quantity of involvement. Fifth, the effectiveness of any educational policy or practice is related to its ability to increase student involvement.

2.2.5 Bean and Metzner's (1985) Student Attrition Theory

Bean and Metzner's (1985) Student Attrition Theory is based on organizational turnover theory and attitude-behaviour interactions theory. It emphasizes that student decisions to leave university are synonymous with adult decisions to leave the workplace. Bean and Metzner developed this theory for non-traditional students. They contend that the student retention theories developed by Spady, Astin, and Tinto relied too heavily on socialization to explain retention and did not take into account the external factors affecting non-traditional students who have fewer opportunities for social integration. They define non-traditional student by age, residence, and attendance. According to Bean and Metzner (1985):

'A nontraditional student is older than 24, or does not live in a campus residence (e.g., is a commuter), or is a part-time student, or some combination of these factors; is not greatly influenced by the social environment of the institution; and is chiefly concerned with the institution's academic offerings (especially courses, certification, and degrees).' (Bean and Metzner, 1985, p.489)

Bean and Metzner's (1985) Student Attrition Theory, presented in Figure 2.5, posits that four sets of variables influence student retention. The first set are academic variables as measured by grade point average. The second is the student's intention to leave, which is expected to be influenced primarily by psychological outcomes (institutional quality, satisfaction, goal commitment and stress) and academic variables. The third are background and defining variables (primarily high school performance and educational goals). The final set of variables are environmental variables such as finances, hours of employment, family responsibilities and opportunity to transfer, which have a direct effect on dropout decisions.

Bean and Metzner find that environmental variables are more important than academic variables for non-traditional students:

'When academic variables are good but environmental variables are poor, students should leave school, and the positive effects of the academic variables on retention will not be seen. When environmental support is good and academic support is poor, students would be expected to remain enrolled- the environmental support compensates for the low scores on the academic variables.' (Bean and Metzner, 1985, pp. 491-492)

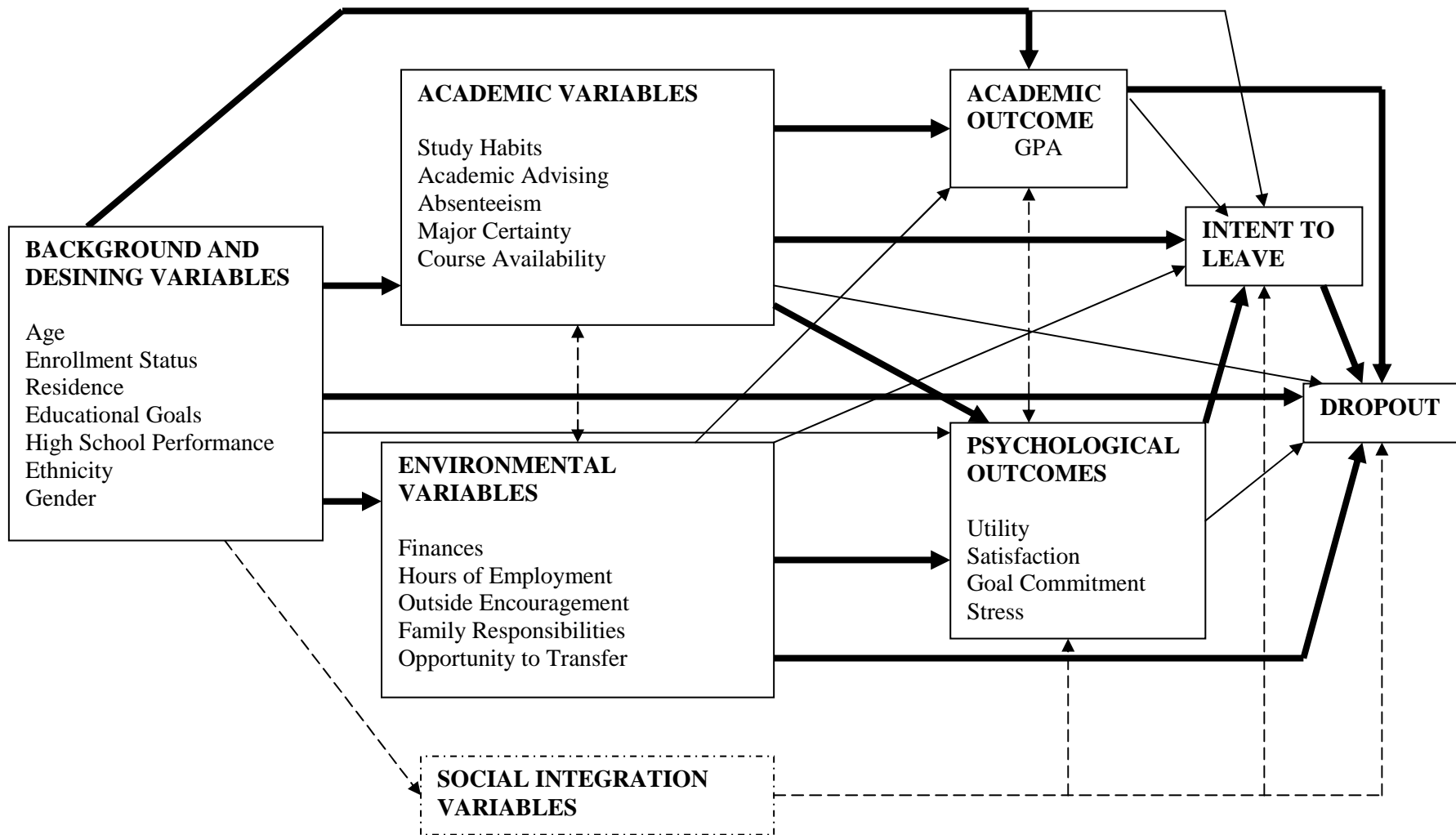


Figure 2.5 Bean and Metzner's (1985) Student Attrition Theory, Bean et al., (1985, p. 491)

Similarly, they find that psychological variables are more important for non-traditional students than academic variables. In other words, if scores on both variables are high, students are more likely to persist and if both are low, the students are more likely to drop out. If the psychological variables are low and the academic variables are high, the students are more likely to drop out. Conversely, if the psychological variables are high and the academic variables are low, the students are more likely to persist.

2.2.6 Cabrera's (1992) Integrated Retention Theory

Cabrera, Castaneda, Nora, and Hengstler (1992) merged both Tinto's (1975) Student Integration Theory and Bean and Metzner's (1985) Student Attrition Theory into one Integrated Retention Model. As noted by Hossler (1984), they examined the commonalities of the two theories. Both models view retention as the result of a complex set of interactions over time; both theories agree that pre-college characteristics affect adjustment and integration; and in addition, both theories agree that a successful match between the student and the institution affect student retention.

However, there are some differences between the two theories. Student Attrition Theory unlike Student Integration Theory, focuses on factors external to the institution such as parental approval, finances, encouragement of friends and the opportunity to transfer to another institution. The two models also differ in how they view academic performance. Student Integration Theory regards academic performance as an indicator of academic integration whereas Student Attrition Theory

regards academic performance as an outcome of social-psychological processes. In addition, empirical research on the two theories suggests different perspectives on what factors have the strongest effect on student retention. Studies using Student Integration Theory suggest that academic integration, social integration, institutional commitment and goal commitment have the strongest impact on student retention (Pascarella and Terenzini, 1980; Munro, 1981; Pascarella and Chapman, 1983a). Conversely, studies using Student Attrition Theory suggest that a student's intention to persist, attitudes, institutional fit and external factors have the greatest impact on student retention (Bean, 1982a; Bean and Vesper, 1990).

The purpose of Cabrera *et al.* (1992) study was to examine the convergent and discriminant validity between the two theories. The data were gathered at several points in time using a questionnaire containing 79 items. These items were selected from several instruments developed by Bean (1982a; 1982b; 1983; 1985), Metzner and Bean (1987), Pascarella and Terenzini (1979), and Terenzini, Lorang, and Pascarella (1981). The 79 items were designed to measure ten constructs: (1) Intent to Persist, (2) Family Approval, (3) Institutional Fit, (4) Courses, (5) Encouragement of Friends, (6) Opportunity to Transfer, (7) Academic Integration, (8) Social Integration, (9) Institutional Commitment, and (10) Goal Commitment. Two additional items were obtained from organizational behaviour literature to measure Institutional Commitment and Goal Commitment (Mowday, Steers and Porter, 1979; Pierce and Dunham, 1987).

Structural equation modelling was used to analysis data in three steps. The first step tested the measurement properties for each construct. For Student Attrition Theory, 14 items were selected from the 79 items to measure eight constructs: (1) Loyalty (one item), (2) Fit Here (one item), (3) Practical Value (two items), (4) Family Approval (two items), (5) Institutional Quality (two items), (6) Courses (three items), (7) Opportunity to Transfer (two items), and (8) Encouragement of Friends (one item). In addition, two items were selected from Nettles *et al.* (1985), to measure Finance Attitudes. The results from the factor analysis indicated that 11 of the 14 items were found to be the most reliable and valid indicators to measure the constructs in the structural model.

For Student Integration Theory, items developed by Pascarella and Terenzini (1979) were selected based on factor analysis conducted by Terenzini *et al.* (1981). These items measured six constructs: (1) Frequency of Contacts with Faculty, (2) Interactions with Faculty, (3) Faculty and Staff Concern for Student Development, (4) Academic and Intellectual Development, (5) Peer Relations, (6) Institutional Commitment and Goal Commitment. In addition, two items were included to measure overall satisfaction with the social and academic life of the institution. Two items to measure Value were also included.

The second step to analyse the data was a structural model. It was found that the structural model of Student Attrition Theory accounted for 44 percent of the variance observed in Persistence and 60.3 percent of the

variance observed in Intent to Persist. Moreover, only six of the fifteen structural paths hypothesized were found to be statistically significant. Three statistically significant paths not hypothesized were also found. These paths were a direct effect of Finance Attitudes on Course and on Grade Point Average (GPA), and a non-casual relationship between Financial Attitude and Parental Approval.

For Student Integration Theory, the structural model accounted for 38 percent of the variance observed in Persistence and for 36 percent of the variance observed in Intent to Persist. Moreover, it was found that nine of the thirteen structural paths hypothesized were found to be statistically significant. Three paths not hypothesized in the model were also found to be statistically significant. These were a direct effect of Academic Integration on Persistence, and two positive relationships between Goal Commitment and Institutional Commitment, and Academic integration and Social Integration.

The last step to analysis the data was performed using a two-step strategy to assess the convergence between each construct across models. First, a polyserial correlation matrix between indicators of both models was computed to explore the convergence across the two models. Second, a modification test was performed to test the convergence between the following constructs: (1) Courses and Academic Integration and (2) Institutional Fit and Quality, and Institutional Commitment. Three structural models were specified for each pair of constructs. The first structural

model hypothesized that the constructs across the two theories were independent (orthogonal) of each pair. The second structural model hypothesized that the constructs across the two theories were correlated. The third structural model hypothesized that the constructs across both theories represented a single construct.

Regarding the convergence between Courses and Academic Integration, the first model was rejected. The second model indicated a plausible representation of the data. The third model provided a perfect fit for the data indicating that Courses and Academic Integration were measures of the same construct. For the convergence between Institutional Quality and Fit and Institutional Commitment, the first model was rejected. The second one provided a good representative of the data. The third model provided a significant improvement of fit over the second model. This indicated that Institutional Quality and Fit, and Institutional Commitment were measures the same construct.

In a follow up study, Cabrera, Nora, and Castaneda (1993) tested the Integrated Model of Student Retention using Structural equation modelling. Their purpose was to examine to what extent the two theories could be merged in order to improve understanding of the processes of student retention. This integrated model, presented in Figure 2.6, has two independent variables and seven dependent variables. The two independent variables are Encouragement from Friends and Family, and Finance Attitudes. The seven dependent variables are Academic

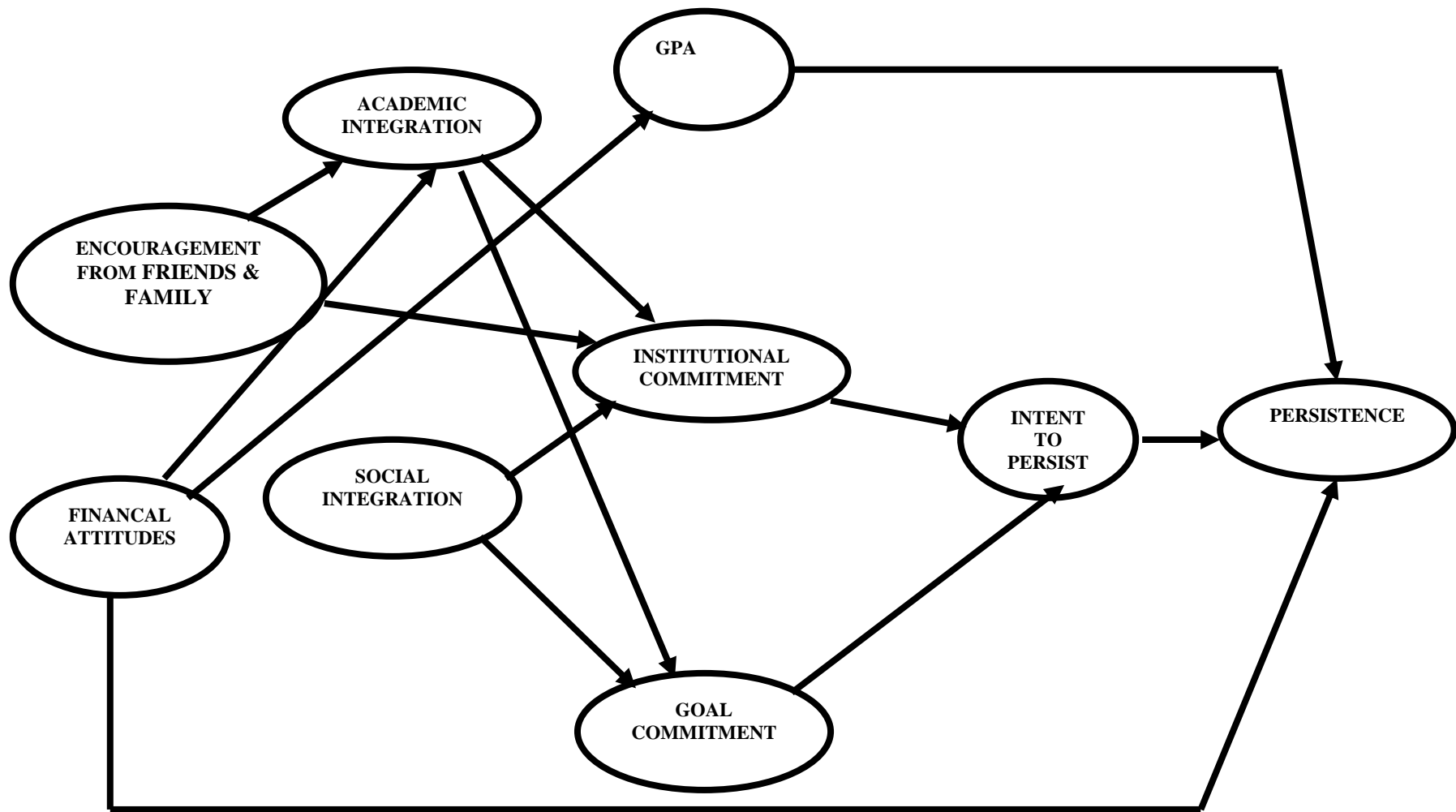


Figure 2.6 Cabrera's (1992) Integrated Retention Theory, Cabrera *et al.*, (1993, p. 128)

Integration, Social Integration, Goal Commitment, Institutional Commitment, GPA, Intent to Persist, and Persistence.

The results indicated that the integrated model was supported. Although the Chi-square was significant, other fit statistics were within the acceptable values. They found that the integrated model explained 45 percent of the variance observed in Persistence and 42 percent of the variance observed in Intent to Persist. Significant structural paths included: (1) the relationship between Academic Integration and Social Integration; (2) the relationship between Goal and Institutional Commitments; (3) the direct effect of Finance Attitudes on Academic Integration and GPA; and, (4) the direct effect of Encouragement from Friends and Family on Institutional Commitment. Non-significant paths included: (1) the direct effect of Finance Attitudes on Persistence; (2) the direct effect of Academic Integration on Institutional Commitment; and, (3) the direct effect of Social Integration on Goal Commitment. The Modification Index suggested that the integrated model could be improved by adding one structural path from Encouragement from Friends and Family to Social Integration. Nora *et al.* (1990) found that encouragement from significant others had a positive effect on student social integration. Therefore, the first modified model was developed by adding this path.

The results of the first modified model indicated an acceptable fit. The first modified model explained 47 percent of the variance in Persistence and 43 percent of the variance in Intent to Persist. Significant paths included:

(1) the direct effect of Encouragement from Friends and Family to Social Integration; (2) the direct effect of Social Integration on Goal Commitment; and, (3) the direct effect of Academic Integration on Institutional Commitment. Based on the recommendation of the modification indices, this model could achieve a better fit by adding one structural path from Encouragement from Friends and Family to Goal Commitment. As noted, Nora *et al.* (1990) found that encouragement from significant others had a positive effect on student goal commitment. As a result, the second modified model was developed by adding this path.

The result of the second modified model showed a considerable improvement of fit comparing to the first modified model. The second modified model explained 47 percent of the variance in Persistence and 43 percent of the variance in Intent to Persist. This suggested that the variance explained by the second modified model offered little improvement over Tinto's Theory and Bean and Metzner's Theory (Cabrera *et al.*, 1992). Two changes were made in this model: (1) a non-significant relationship between Goal and Institutional Commitments and (2) a non-significant direct effect of Social Integration on Goal Commitment. Moreover, the largest total effect on Persistence was accounted for by Intent to Persist, followed by GPA, Institutional Commitment, Encouragement from Friends and Family, Goal Commitment, Academic Integration, Finance Attitudes, and Social Integration. The largest effect on Intent to Persist was accounted for by Institutional Commitment, followed by Encouragement from Friends and

Family, Goal Commitment, Academic Integration, Social Integration, and Finance Attitudes. Further examination of the modification indices did not suggest any additional paths that would significantly improve the fit of the model to the data. The conclusion of the study confirmed that a better understanding of student retention can be achieved by integrating Tinto's Theory and Bean and Metzner's Theory.

To summarize, student retention in higher education has been the subject of an enormous amount of research over seven decades. Researchers have studied student retention in higher education from five theoretical perspectives: psychological, social, economic, organizational, and interactional. The psychological perspective focuses on individual personality attributes. In contrast, the social perspective focuses not on the individual, but rather on social forces that are external to the higher education institution such as social status, race, and prestige. The economic perspective focuses on the individual finance and financial aid that affects student retention. The organizational perspective is concerned with the impact of organizational factors such as bureaucratic structure, size, and faculty-student ratios on student retention. The interactional perspective focuses on the influence of the interaction of individual and environmental factors on student retention.

Six of the most widely tested theories of student retention were reviewed. These were Spady's (1970) Student Departure Theory, Tinto's (1975,1993) Student Integration Theory, Pascarella's (1980) Attrition

Theory, Astin's (1984) Student Involvement Theory, Bean and Metzner's (1985) Student Attrition Theory, and Cabrera's (1992) Integrated Retention Theory. In Spady's theory, the critical factor is normative congruence. The most critical factors in Tinto's theory are social and academic integration and commitment. In Pascarella's theory, the critical factor is the informal contact between student and faculty. For Astin, the critical factor is student involvement. Bean and Metzner's theory focuses on factors external to the institution. Cabrera's theory combines both Tinto's and Bean and Metzner's theory.

However, these theories have something in common. Most theories tend to be longitudinal, complex, and contain several factors, often set in a causal pattern. In addition, they include student background characteristics as important determinants of student retention.

2.3 Studies testing Tinto's model

In this section, studies testing Tinto model will be reviewed. Tinto (1975) postulates that students enter college with various individual characteristics. These student entry characteristics include family background characteristics, individual attributes, and pre-college schooling experiences. Family background characteristics include family socio-economic status, parental educational level, and parental expectations. Examples of individual attributes described by Tinto include academic ability, race, and gender. Pre-college schooling experiences include the

characteristics of the student's secondary school and high school academic achievement.

These student entry characteristics are hypothesized to directly influence students' initial commitment to the institution and commitment to the goal of college graduation. In turn, Initial commitment to the institution and commitment to the goal of graduation affect the level of a student's integration into both the academic and social systems of the college.

Subsequent commitments to the institution and to the goal of graduation are affected by academic and social integration. Other things being equal, the greater the student's level of social and academic integration, the greater the subsequent level of both institutional commitment and commitment to the goal of college graduation. Both subsequent commitments are also affected by the student's initial level of commitment. In turn, these subsequent commitments directly influence student retention (Tinto, 1975). A path diagram of Tinto's model is presented below in Figure 2.7.

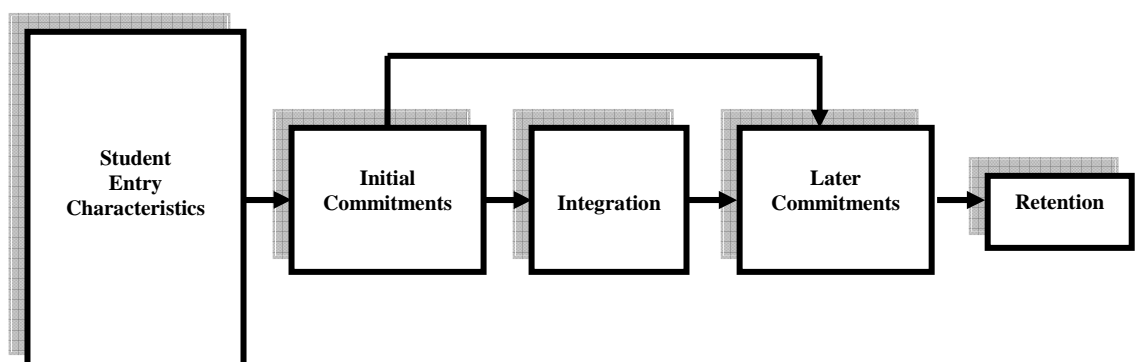


Figure 2.7 Path Diagram of Tinto Model

There are important distinctions between residential and commuter institutions (Braxton, Hirschy, and McClendon, 2004). Residential institutions have well-defined social communities. In comparison, commuter institutions have a lack of structure and clarity in relation to the social communities. In addition, students in commuter institutions experience other obligations such as jobs and family commitments (Tinto, 1993). Therefore, previous studies are grouped into three sections: studies conducted at residential institutions, studies conducted at commuter institutions, and studies conducted across different types of institutions.

2.3.1 Studies testing Tinto's theory in residential institutions

This section will review studies that have tested the Tinto model in residential institutions. The first study was conducted by Terenzini and Pascarella (1977). The purpose of their study was to examine the effects of social and academic integration on student retention and also to determine the contributions of each type of integration to the prediction of student retention.

Data were obtained from 379 freshman students. Questionnaires were distributed by mail during the second semester to assess students' levels of academic and social integration. Academic integration was measured by freshman GPA and students' perceptions of the academic program at the university using the Adjective Rating Scale. Social integration was measured by students' perceptions of non-academic life at the university using the Adjective Rating Scale, the number of extracurricular activities in

which they were involved, and the number of informal interactions they had with faculty. Retention was determined by whether or not students returned for the sophomore year. Student retention status and freshman GPA were taken from the university admission office.

A principle components factor analysis was performed on the Adjective Rating Scale. The result yielded five academic factors and four social factors. The academic factors were interest value, dullness/apathy, practical appeal, difficulty/challenge, and uniqueness of students' academic program. The social factors were interest value, demand/challenge, practical appeal of students' non-academic lives at the college, and an unnamed factor.

Multivariate analysis of variance was used to determine if the measures of academic and social integration could differentiate between persister and non-persister students. The result indicated that both types of integration measures differentiated significantly between persisters and non-persisters.

Stepwise discriminant analysis was employed to assess the relative contributions of academic and social integration measures to the separation of persisters and non-persisters. Among academic integration measures, persisters were more interested in their academic program than non-persisters. Freshman GPA did not discriminate meaningfully between persister and non-persister students. Among social integration measures, persisters had more informal contacts with faculty members and also

found their non-academic lives to be more demanding and challenging than non-persisters. This results indicated that persisters, when compared with non-persisters, were more involved in the academic and social system of the university. However, this study is limited in that many of Tinto's constructs were not included.

Consequently, Terenzini and Pascarella (1978) tested the validity of the Tinto model with student background characteristics and social and academic integration as predictors of student retention. Data were obtained from 536 freshman students using two questionnaires. The first questionnaire was mailed to students in the summer before entry to college to assess their expectations of a variety of aspects of the college experience and to collect their background characteristics. The second questionnaire was mailed during the second semester to assess students' social and academic integration. Retention was determined by whether or not students returned for the sophomore year.

Background characteristics included sex, ethnicity, major, academic aptitude, high school achievement, personality, parent's education, expectations of academic and non-academic life at the college, expected number of informal contacts with faculty, and expected participation in extracurricular activities. Academic integration was measured by freshman GPA, by students' satisfaction with their intellectual development progress, and by the affective appeal, practical value, dullness and challenge of the academic program factors. Social integration was measured by the

number of informal contacts with faculty, by the number of extracurricular activities, by students' satisfaction with their personal development progress, and by the affective appeal, practical value, dullness, and challenge of their non-academic lives.

Using stepwise multiple regression, the results indicated that the strongest predictor of student retention were academic integration measures, explaining 5.6 percent of the variance in student retention. Social integration measures explained a more modest amount of the variance (3%). Background characteristics variables were found to be statistically non-significant.

This result indicated that what happens to students during the freshman year may be more important than their background characteristics in predicting their retention. In addition, the results suggested that what happens in students' academic lives may be more important than their social experiences in their retention decisions.

Pascarella and Terenzini (1979) conducted a study to test the predictive validity of the Tinto model for different types of students. Data was obtained from 773 student using two questionnaires.

The first questionnaire mailed to students in the summer prior to college entry collected students' entering characteristics and assessed their initial goal and institutional commitments. Student background characteristics included sex, ethnicity, academic aptitude, high school achievement, number of high school extracurricular activities, expected number of

informal contact with faculty, parents' education, parents' income. Initial goal commitment was measured by a student's highest expected degree and by the perceived importance of graduation from college. Initial institutional commitment was measured by the self-reported rank of this university as a college choice and confidence that choosing to attend this university was the right decision.

The second questionnaire was mailed to students during the second semester. This questionnaire asked students to respond to items assessing their involvement in extracurricular activities during the freshman year, frequency of informal contact with faculty, and a series of 34 Likert-scale items designed to measure the various dimensions of social and academic integration and later goal and institutional commitments. A principal components factor analysis of these 34 items yielded five factors with eigenvalues ranging from 6.14 to 1.67, explaining 44.45 percent of the variance (Pascarella and Terenzini, 1980). These five factors were named: peer group relations, informal relations with faculty, faculty concern for teaching and student development, academic and intellectual development, and institutional/ goal commitment.

Social integration was operationalized by scores on involvement in extracurricular activities, peer-group relations and informal relations with faculty factors, and the frequency of informal contacts with faculty to discuss campus issues, to socialize informally and to resolve a personal problem. Academic integration was operationalized by freshman GPA,

scores on the faculty concern for teaching and student development factor and the academic and intellectual development factor and, informal contacts with faculty to obtain advice and information about academic programs and to discuss intellectual matters and career concerns. Later institutional and goal commitments were measured by scores on institutional and goal commitment factors. Retention was determined by whether or not students returned for the sophomore year.

Setwise discriminant analysis employed separately for men and women indicated that student characteristics were not significantly related to retention for either sex. Both social and academic integration were significantly related to retention for both men and women. However, academic integration made more of a contribution for men and social integration made more of a contribution for women. In addition, institutional and goal commitments were significantly related to retention for men but not for women.

The researchers also presented the standardized discriminant weights for each measures of academic and social integration for both sexes. Among the academic integration measures, three measures had significant effects on retention for male students. Male students who had low grades on GPA (-0.308), who had high scores on faculty concern for teaching and development factor (0.329) and who had more informal contacts with faculty to discuss intellectual matters (0.408) were more likely to persist. The negative sign of GPA may reflect that 'male students performing

particularly well academically are likely to transfer to other institutions generally regarded as more prestigious and academically demanding' (Pascarella *et al.*, 1979, p. 203). On the other hand, only one measure of academic integration had a significant effect on retention for female students. Female students who had few informal contacts with faculty to obtain information about courses and programs (-0.314) were more likely to persist.

Among the social integration measures, three measures had significant effects on retention for men. Male students who had high scores on the relations with faculty factor (0.304), who had few informal contacts with faculty to discuss personal problems (-0.334) and who had more informal contacts with faculty to discuss to campus issues (0.282) were more likely to persist. Two measures of social integration had significant effects on retention for females. Female students, who had more relations with peers (0.482) and who had more informal relations with faculty (0.397), were more likely to persist. These results also suggested that what happens during the freshman year may be more important than student entering characteristics in predicting student retention.

Using a similar sample, Pascarella and Terenzini (1980) conducted an additional study to assess the predictive validity of the instrument that they had developed to measure academic and social integration. They sought to determine whether this instrument would discriminate between persisters and dropouts while controlling for the influence of student

background characteristics. This instrument yielded five scales named: peer group relations, informal relations with faculty, faculty concern for teaching and student development, academic and intellectual development, and institutional/ goal commitment.

Multivariate analysis of covariance was performed to determine if these five scales significantly differentiated between persisters and non-persisters. The result showed that each of the five factors significantly discriminated between the two groups of students.

Using setwise discriminant analysis to estimate variable contributions to group discrimination, the results showed that the Institutional and Goal Commitments factor made the largest contributor (0.53), followed by Interactions with Faculty (0.47), and Faculty Concern for Student Development and Teaching (0.32). Peer-Group Relations and Academic and Intellectual Development did not contribute significantly.

Since different dimensions of social and academic integration were hypothesized to have different influences on decisions to persist or withdraw for different kinds of students, the analysis was re-performed with all interactions included. Only two of the interactions were significant. Female students were more likely to be influenced by the quality of peer-group interactions than male students in making their decisions to persist or withdraw. Conversely, male students were more likely to be influenced by institutional and goal commitments than female students in making their decisions to persist or withdraw.

This study suggested that the five institutional integration scales might be useful in identifying potential dropout students during the second semester of the freshman year.

Terenzini, Lorang, and Pascarella (1981) conducted a replication of this study using data of 469 freshman students. The result of the multivariate analysis of covariance indicated that only three of the five factors significantly differentiated between persisters and non-persisters. The three factors were peer group relations, academic and intellectual development and institutional and goal commitment.

Moreover, the result of the setwise discriminant analysis indicated that the institutional and goal commitment factor made the largest unique contribution to group differentiation (0.73). In comparison to the former study, this study found no significant interactions.

The difference between these studies may be due to institutional type. The former study was conducted at a large private university while the latter one was conducted at a large public university. This suggests the importance of considering institutional type in developing a model of student retention.

Previous research had only tested the major constructs of Tinto's model. They did not test the validity of the model with all constructs in causal sequence. Moreover, previous research had used correlation and multiple regressions to test the model. These techniques are not adequate because they cannot examine the relationships within the model (Stage,

1988). Tinto (1975) suggested using a path analysis to test his model because this technique can specify order and causality among the variables. Therefore, Pascarella and Terenzini (1983) used a path analysis to test the validity of Tinto model with all constructs.

Data were collected from 763 freshman students using two questionnaires and the university admission office. The first questionnaire was mailed to students during the summer to collect background characteristics and to assess their initial goal and institutional commitments. The second questionnaire was mailed to students during the second semester to assess their integration and later commitments. Retention, SAT scores, high school class rank and freshman year GPA were gathered from the university admission office. Retention was measured by whether or not students registered for the second year.

Background characteristics included sex, race, SAT scores, major, high school class rank, socio-economic status, and extracurricular activity in high school. Initial goal commitment was measured by a combination of the student's highest expected degree and the importance of graduating from college. Initial institutional commitment was measured by the self-reported rank of the college choice and confidence that choosing to attend this university was the right decision.

Academic integration was measured by freshman year GPA, scores on the faculty concern for teaching and student development scale, the academic and intellectual development scale and informal contacts with

faculty to discuss academic or career concerns. Social integration was measured by scores on involvement in extracurricular activities, peer-group relations, the informal relations with faculty scales, and frequency of informal contacts with faculty to discuss social or personal concerns. Later institutional and goal commitments were measured by the scores on institutional and goal commitment scale.

The results from the path model for the overall sample explained only 18.1 percent of the variance in retention. The model for the overall sample was generally consistent with Tinto's model.

Background characteristics had direct effects on initial commitments but had no effect on retention. Students whose parents were less educated and wealthy (-0.10), and who enrolled in professional majors (-0.09) were predicted to have high levels of initial institutional commitment. Students with high levels of initial goal commitment were predicted to be those who were Non-White (-0.09), who enrolled in Liberal arts majors (0.23) and who participated in extracurricular activities during high school (0.11).

Initial goal commitment had a direct, equal effect on both academic (0.10) and social (0.10) integration. On the other hand, initial institutional commitment did not have any effect on integration. Both initial commitments positively predicted later commitments. Initial goal commitment (0.22) predicted later goal commitment and initial institutional commitment (0.19) predicted later institutional commitment.

Both types of integration positively predicted later commitments. Academic integration had a direct effect on later goal commitment (0.15) and later institutional commitment (0.18). While social integration had only a direct effect on later institutional commitment (0.12). Moreover, both academic and social integration had direct and approximately equal effects on retention (0.19 and 0.14, respectively).

Both later commitments had a direct influence on retention. The effect of later institutional commitment (0.23) was much higher than that of later goal commitment (0.08).

When separate analyses were conducted by gender, the results indicated some substantial differences. First, the influence of initial goal commitment was found to be more pronounced for females than for males. For both models initial goal commitment had a direct effect on later goal commitment. However, female initial goal commitment also had a direct effect on both social integration and retention. On the other hand, the effects of initial goal commitment for males were basically indirect and mediated through academic integration and later goal commitment.

Second, social integration was found to have a stronger direct effect on female retention than academic integration, whereas the reverse was found for males. This study indicated that factors affecting student retention may vary significantly by gender.

Terenzini, Pascarella, Theophilides, and Lorang (1985) replicated the study conducted by Pascarella and Terenzini (1983). Data were collected

from 723 freshman students. The variables were measured as in Pascarella and Terenzini's study.

Similar to Pascarella and Terenzini's study, the model in this study explained only a small amount of variance in student retention (11.5%). In addition, the mode in this study was generally consistent with Tinto's model.

Both studies found that background characteristics had direct effects on initial commitments but had no effect on retention. In this study, students whose parents were less educated and wealthy (-0.10), and who enrolled in a professional major (-0.17) were predicted to have high levels of initial institutional commitment. Students with high levels of initial goal commitment were predicted to be those who were male (-0.08), who enrolled in Liberal arts (0.15) and who participated in extracurricular activities during high school (0.11).

Consistent with Tinto's model and earlier study, both initial commitments were found to positively predict later commitments. Initial goal commitment (0.10) predicted later goal commitment and initial institutional commitment (0.21) predicted later institutional commitment. Both studies also found that initial goal commitment had a direct effect on social integration (0.09). On the other hand, inconsistent with Tinto's model initial institutional commitment did not have any effect on either types of integration in both studies.

Academic integration was found to have direct effects on both later goal commitment (0.10) and later institutional commitment (0.18). Inconsistent with Tinto's model and former study, social integration did not have any effect on later commitments. In addition, social integration (-0.05) had a small, negative and direct effect on retention. In other words, students who were more socially integrated in the university were predicted to dropout. The researchers explained that Tinto's model indicated no direct effect from either types of integration on retention.

Consistent with Tinto's model and former study, this study also found that both later commitments had a direct influence on retention. The effect of later institutional commitment (0.32) was much higher than that of later goal commitment (0.09). Both studies indicated that Tinto's model had predictive validity in predicting student retention between the freshman and sophomore years.

Stage (1988) had criticized research which employed a path analysis technique to test the validity of Tinto's model because this statistical method requires an assumption of no measurement error among variables. Ignoring measurement error could lead to systematic bias in parameter estimates. Moreover, path analysis requires the variables to be normally distributed and a retention variable is usually not normally distributed. Therefore, Stage (1988) conducted a study to test the validity of Tinto's model using structural equation modelling. This statistical method is able to take measurement error of the variables into account.

Data were collected from 313 freshman students from two questionnaires and from the university admission office. The first questionnaire was administered during the first two weeks to collect students' background characteristics and to assess their initial goal and institutional commitments. The second questionnaire was administered during the third month of the first semester to assess students' levels of academic and social integration and also their later commitments. Data taken from university admission office were first semester GPA, hours earned and retention status. Retention was determined by whether or not students registered for the second semester.

Background characteristics included age, gender and parents' education. Initial and later commitments were measured using Pascarella and Tereinzini's (1980) scale. Academic integration was measured by first semester GPA, credits earned, participation in academic activities, the academic development scale, and faculty concern scale. Social integration was measured by residency, campus employment, participation in social activities, the peer group relations scale, and the informal faculty relations scale.

Data were analysed separately by sex. The numerical values for each path were not reported in this study. In general both male and female models did not support most of Tinto's propositions. Both models had a generally similar pattern. None of the background variables had a direct effect on either initial commitments or retention. Initial goal commitment

did not predict any types of integration while initial institutional commitment predicted only social integration. In addition, both initial commitments had significant effects on later commitments.

Academic integration failed to predict any type of later commitments. On the other hand, social integration predicted only later institutional commitment. In addition, both types of integration were found to significantly predict retention.

Later goal commitment failed to predict retention for both models. The only difference between both models was the effect of later institutional commitment on retention. For female students, later institutional commitment was a significant predictor of retention while it was not significant for male students. However, this finding should be viewed with caution because the male and female sample sizes were relatively small. In addition, this study tested Tinto's model over one semester.

Some researchers have tested Tinto's model with the addition of other constructs to improve the explanatory power of the model and to provide information about potential sources and influences on social and academic integration for students. For example, Pascarella, Terenzini and Wolfle (1986) examined the influence of an institutional intervention on student retention within Tinto's model. The intervention was a pre-college orientation program and it was measured by asking students to indicate whether or not they had attended orientation. It was hypothesized that attending an orientation program might have a small positive effect on

academic integration, but would have a strong effect on both social integration and later institutional commitment. Therefore, attending an orientation program construct was placed between initial commitments and integrations (Figure 2.8). The researchers used similar data as in Pascarella and Terenzini's (1983) study.

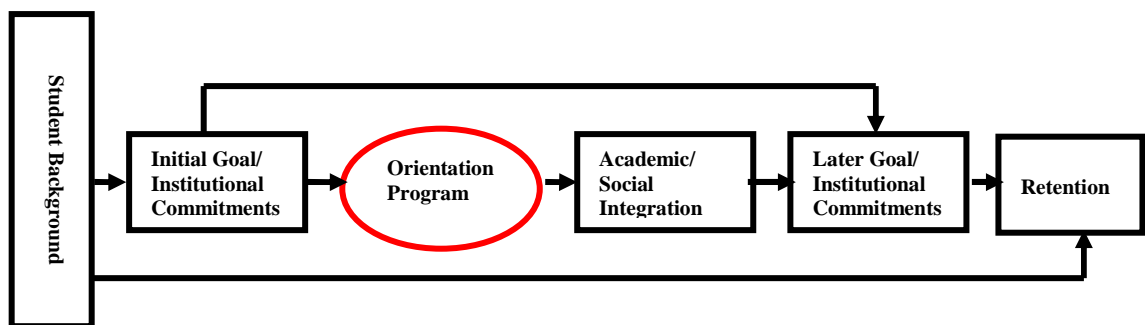


Figure 2.8 A Path Diagram of the Impact of Attending Orientation Program within Tinto Model

Using multiple regression analysis, the results indicated that the model explained 19.6 percent of the variance observed in retention. The model was generally consistent with Tinto's model. None of the background characteristics had significant effects on retention.

Initial goal commitment had a direct effect on social integration (0.142) whereas initial institutional commitment did not have any effect on either social or academic integration. In addition, both initial commitments were found to have significant influences on later commitments (0.227 for later goal, 0.156 for later institutional).

Both integrations had significant effects on later commitments. Academic integration had significant effects on later goal commitment (0.107) and

later institutional commitment (0.166). Social integration had a significant effect on later institutional commitment (0.175). Moreover, academic integration significantly predicted retention (0.270). Later commitments were found to have effects on retention. However, later institutional commitment (0.232) had a greater effect than later goal commitment (0.079).

Regarding the effect of attending an orientation program on retention, the results indicated that attending an orientation program did not have a direct effect on retention. However, it had an indirect effect on retention mediated through social integration and later institutional commitment. In other words, students attending an orientation program had higher levels of social integration and later institutional commitment than those students not attending an orientation program.

Milem and Berger (1997) tested the validity of Tinto's model with the addition of an involvement construct from Astin's theory. They argued that previous research has focused on the perceptual component of academic and social integration while ignoring measures of actual behaviours. Involvement constructs may provide potential sources of academic and social integration. As a result, they were placed in the model between initial commitments and integrations (Figure 2.9).

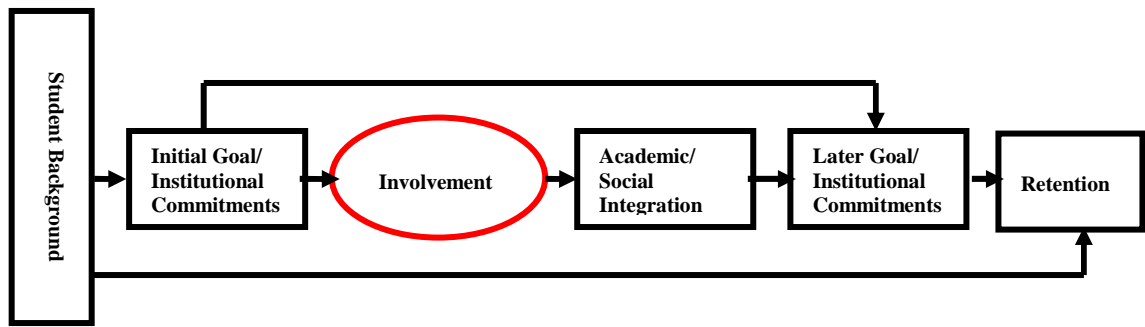


Figure 2.9 A Path Diagram of the Impact of Involvement within Tinto Model

The data were collected from 718 freshman students. Students' background characteristics and their initial commitment data were collected at the end of the freshman orientation. Background characteristics included race, gender, political view, high school GPA and family income. Initial institutional commitment was measured by one item asking students about their choice of institution. Initial goal commitment was measured by a combination of the student's highest expected degree and the importance of graduating from college.

Social integration, later institutional commitment and intention to persist data were collected during the second semester. Social integration was measured by two scales from Pascarella and Terenzini (1980): peer-group relations and faculty relations. Later institutional commitment was measured by one scale from Pascarella and Terenzini (1980). Retention was determined by a students' intention to persist.

Data was analyzed using Path Analysis. The results indicated the model explained 41 percent of the variance in intention to persist. Initial and later goal commitments were excluded from the model because there was no

variation in goal commitment for students in this data. Nearly every student who enters the institution is highly committed to the goal of receiving at least a bachelor's degree.

Most of the background characteristics variables had direct effects on initial institutional commitment except high school GPA and parental income. Being a woman (0.10), being White (0.14) and being African American (0.10) were all found to positively predict initial institutional commitment, whereas having a more liberal political ideology (-0.08) was found to negatively predict initial institutional commitment. None of the background characteristics had direct impacts on intent to persist.

Initial institutional commitment did not predict either social or academic integration. However, it was a weak positive predictor of later institutional commitment (0.08). Academic integration did not predict either later institutional commitment or intent to persist. However, social integration had a direct effect on later institutional commitment (0.31) and intent to persist (0.13). Later institutional commitment had the strongest impact on intent to persist (0.40).

Regarding the effect of student involvement on both social and academic integration, it was found the involvement directly affected both types of integration and retention.

The above study examined only the direct effects among variables and used a proxy measure of retention (students' intent to persist) rather than an actual measure of retention. Therefore, Berger and Milem (1999)

replicated this study by calculating direct and direct variable effects and by using an actual measure of retention using the same dataset. Retention was taken from the university admission office and it was determined by whether or not students returned for the sophomore year.

Using a Path Analysis approach, the results indicated that the model explained 25 percent of the variance in retention. Regarding the effect of background characteristics, being black (0.12), being white (0.11) and being female (0.10) had a statistically significant direct effect on initial institutional commitment. Only one background variable had a direct effect on retention. Students who were white (-0.13) were predicted to persist.

Initial institutional commitment had no direct or indirect effect on social or academic integration. However, it had a significant direct effect on later institutional commitment (0.08). Social and academic integration both had a positive impact on later instructional commitment (0.39 and 0.09 respectively). Social integration had a significant direct and indirect effect on retention (0.14 and 0.15, respectively) whereas academic integration did not. Later institutional commitment had the greatest direct effect on retention (0.38).

Regarding the effects of student involvement on academic and social integration, the results indicated that involvement had direct and indirect effect on both types of integration and retention.

Brower (1992) tested Tinto's model with the addition of student life task constructs. The researcher argued that instruments designed to measure

integration such as the one developed by Pascarella and Terenzini's (1980) neglected how students shape and modify their college environment by engaging in specific activities and by pursuing their own goals and tasks. Those instruments measured only the extent to which students agree with a set of goals, values and ideals of the university. Student Life Task was placed between initial commitments and integrations (Figure 2.10).

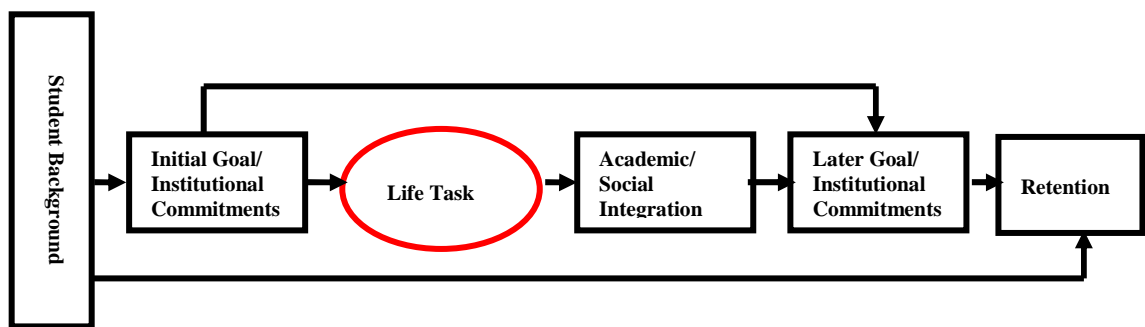


Figure 2.10 A Path Diagram of the Impact of Life Task within Tinto Model

The data was obtained from 311 freshman students using two questionnaires administered in the first and second semesters. Background characteristics included age, sex, high school class rank and socioeconomic status. It was obtained from the university admission office. Initial and later goal commitment was measured by five items such as “I know why I’m in college, and what I want out of it,” and “Getting a college degree is very important to me.” Initial and later institutional commitment was measured by six items such as “I feel that I fit in well as part of the UM-Madison environment” and “I am pleased now about my decision to attend UW-Madison in particular.” Initial commitments were collected from

the first questionnaire while later commitments were collected from second questionnaire.

Academic integration was measured by students' GPA earned in the first semester, number of credits earned in the first semester, total number of hours per week spent on academically oriented activities and attitudes and feelings about their academic activities. Social integration was measured by attributes and feelings about social activities and total number of hours per week spent engaged in social activities. Integration data were collected from the second questionnaire except GPA and number of credits which were obtained from the university admission office.

Life task predominance was measured by asking students to list 'all of the life tasks that come to mind for you as you think about the coming year. Your list can include tasks ranging from the mundane to the monumental, as well those that you will actively seek out and those you will simply stumble into' (Brower, 1992, p. 451). Then, the students were asked to rank order them for importance and code them into one of the seven life task domains (grades, future, friends, alone, identity, time, and physical). It was measured twice. Early life task variables were collected from the first questionnaire while the later life task variables were collected from the second questionnaire.

Retention was measured with an interval variable consisting of the total number of semesters in which students were enrolled, data obtained from the university admission office.

Linear regressions were performed to compare Tinto's model without and with life task constructs. The results showed that the addition of the life task variables significantly improved the prediction of retention (Adjusted $R^2 = 0.19$ versus 0.10). Using only Tinto's model, high school class rank (0.22) was a significant predictor, followed by socioeconomic status (0.18), later institutional commitment (0.14) and sex (-0.13). Those students who performed better in high school, who were from a higher socio-economic background, who were more committed to their institution and those who were female were predicted to enrol for the greatest number of semesters. Social and academic integration, initial and later goal commitment, and initial institutional commitment were not significant predictors.

Using Tinto's model with the addition of the life task variables, none of Tinto's variables were found to be a significant predictor except two variables of background characteristics: sex (-0.20) and socioeconomic status (0.21). Three of the life task variables were found to be significant predictors. Students were more likely to remain enrolled when they focused less on making friends (-0.33) and on their identities (-0.027) in their first semester, but focused more on making friends in their second semester (0.33). However, many of the relationships between the variables within Tinto's model were not tested because the data were analyzed using a regression method.

Thomas (2000) examined the role of student social structure in predicting retention within Tinto's model, placing this construct between initial commitments and integration (Figure 2.11).

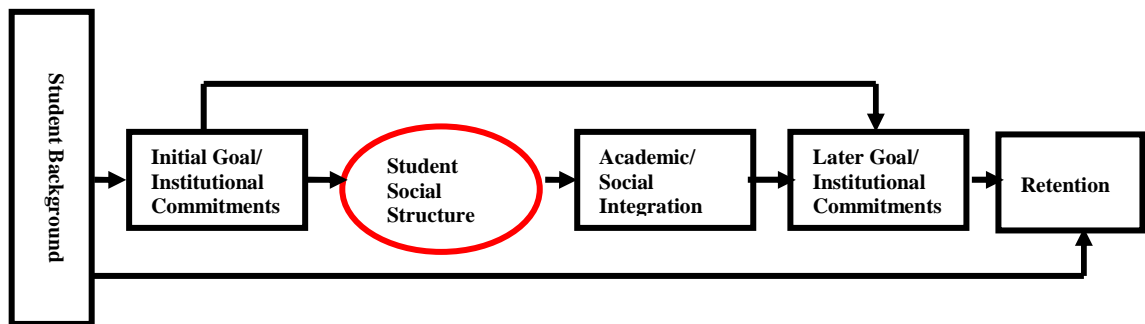


Figure 2.11 A Path Diagram of the Impact of Student Social Structure within Tinto Model

Data were collected from 379 freshman students from two questionnaires and from the college admission office. The first questionnaire was administered during orientation and registration to collect students' initial goal and institutional commitment. Initial goal commitment was measured by one item about the importance of graduating from college in general. Initial institutional commitment was measured by one item about the importance of graduating from this college in particular.

The second questionnaire was mailed to students toward the end of the second semester to assess their social and academic integration, later goal and institutional commitments, intent to persist and student social structure. Integrations and commitments were measured using some items from Pascarella and Terenzini's (1980) scales. A student's intent to persist was measured by asking students one item about their likelihood of attending this college during the next year. Student social structure data

were measured by asking students to list the names of those students with whom they frequently spoke and the dimensions on which they related to these other students such as being a close personal friend or a source of academic or social advice.

Data collected from the college admission office included students' background characteristics, freshman GPA and persistence status. Background characteristics included gender, race and combined SAT score. Persistence was defined as whether or not students were enrolled the following year.

Data were analysed using a Path Analysis approach. The results indicated that the model fit for the data was good with a chi-square of 55.87 ($df= 55$, $p=0.44$). The model accounted for only 26 percent of the variance in retention. Although Tinto's theory hypothesized that student background characteristics have direct effects on initial commitments, this proposition was not tested. Among background characteristics, only SAT had a direct effect on retention (0.09).

Initial goal commitment was found to affect academic integration (0.08), later goal commitment (0.53) and intention (0.19). Initial institutional commitment was found to impact social integration (0.09), later institutional commitment (0.34) and intention (0.29).

Social integration had no effect on both later commitments and retention, but had a direct effect on intention (0.15). In contrast, academic integration

was found to affect later goal commitment (0.09), intention (0.13), and retention (0.14)

None of the later goal and institutional commitments had direct effects on either intention or persistence. Intention was found to be the strongest predictor of student retention (0.75).

Regarding the effects of student social structure within Tinto model, the results indicated that students with a higher proportion of ties with their own peer group had lower levels of social integration (-0.10), lower levels of academic integration (-0.18) and lower grade performance (-0.05). This study suggested that students with a broader student social structure in the form of a higher proportion of ties outside their peer group perform better academically and are more likely to persist.

Some researchers have focused on elements of Tinto's model because these were supported in residential institutions (Braxton *et al.*, 1997). These supported propositions are shown in Figure 2.12. However, these propositions are incomplete because social integration is unexplained. Therefore, researchers have tried to elaborate Tinto's model by applying new concepts from other theoretical perspective to explain the focal phenomena (Braxton *et al.*, 1997).

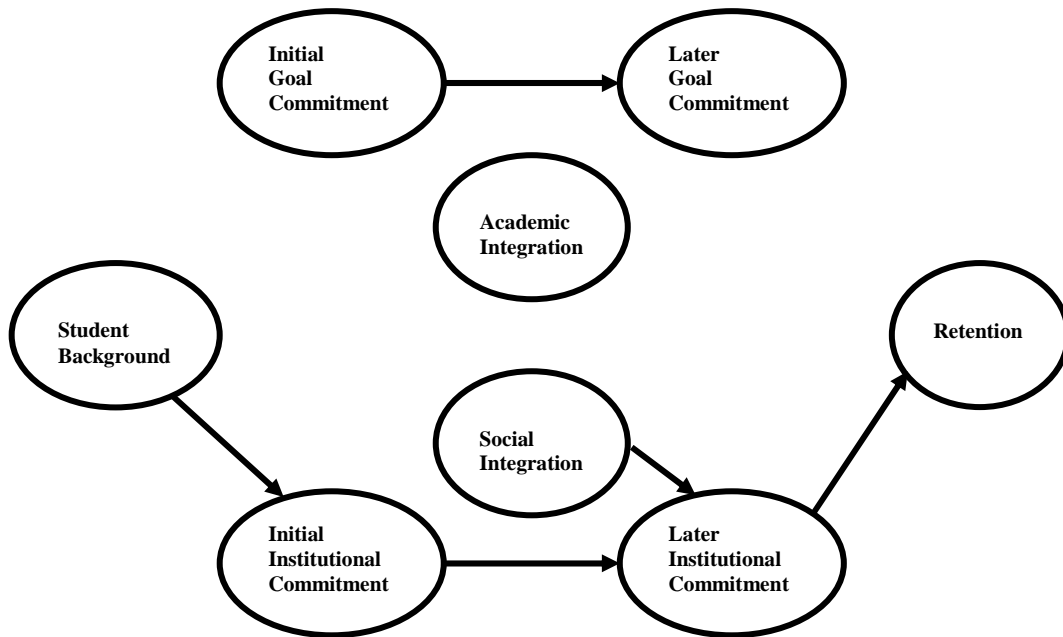


Figure 2.12 Strongly Supported Propositions (Braxton *et al.*, 1997, p. 155)

These researchers have used the same dataset collected as part of a longitudinal study of first year retention at a highly selective, private, and residential university. The data were collected from 718 freshman students. Students' background characteristics and their initial institutional commitment data were collected at the end of the freshman orientation. Background characteristics included race, gender, political view, high school GPA, and family income. Initial institutional commitment was measured by one item asking students about their choice of institution.

Social Integration, later institutional commitment, and intent to persist data were collected during the second semester. Social integration was measured by two scales from Pascarella and Terenzini (1980): peer-group relations and faculty relations. Later institutional commitment was measured by one scale from Pascarella and Terenzini (1980). Retention was determined as students' intent to persist.

Berger (1997) used concepts from community psychology literature to elaborate Tinto's model. Tinto (1993) asserted that every campus is composed of multiple communities, any one of which could provide a way for a student to become integrated into campus life. Berger investigated how campus communities such as residence halls affect the process of social integration. It was hypothesized that students' sense of community within their campus living units affects levels of social integration. As a result, it was placed between initial institutional commitment and social integration (Figure 2.13).

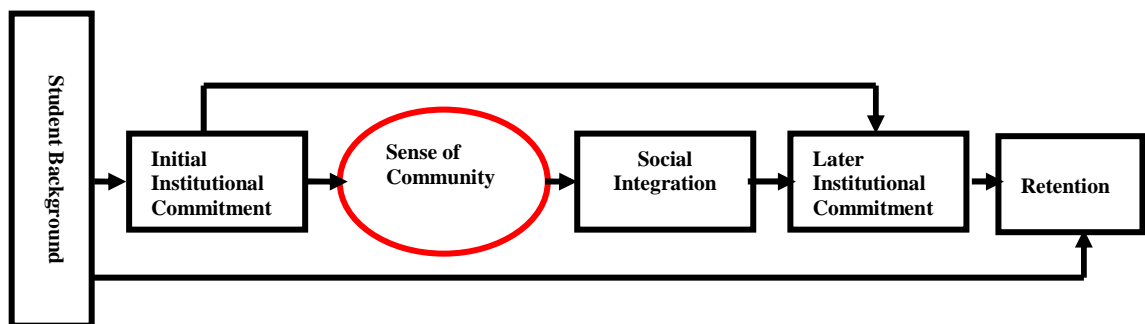


Figure 2.13 A Path Diagram of the Impact of Sense of Community within Tinto Model

Using the Path Analysis technique, the results indicated that the model explained 42 percent of the variance in intent to persist. Two background variables had direct effects on initial institutional commitment. Students who were female (0.10) and who were white (0.11) were more likely to have high levels of initial institutional commitment. In addition, two background variables had direct effects on intent to persist. Students who performed well in high school (0.07) and who were non-white (-0.07) were more likely to intend to persist.

Initial institutional commitment had no direct or indirect impact on either measures of social integration. However, it had a weak and direct influence on later institutional commitment (0.06).

Both measures of social integration had direct effects on later institutional commitment. However, the effect of peer relations (0.55) was much stronger than the effect of faculty relations (0.10). Moreover, it was found that both measures of social integration directly and indirectly predicted intent to persist. Peer relations had much stronger direct (0.20) and indirect (0.29) effects than direct (0.01) and indirect (0.5) effects of faculty relations.

Later institutional commitment had the strongest direct effect on intent to persist (0.52). Regarding the effect of students' sense of community on social integration, the results indicated that students' sense of community in their residence halls was a source of social integration. Students with a strong sense of community in their residence halls were more likely to integrate into the campus social system.

Berger and Braxton (1998) suggested that one potential source of influence on social integration may be the ways in which students experience the organizational attributes of an institution such as participation in organizational decision-making, fairness in the administration of policies and rules and communication. Therefore, it was placed between initial institutional commitment and social integration (Figure 2.14).

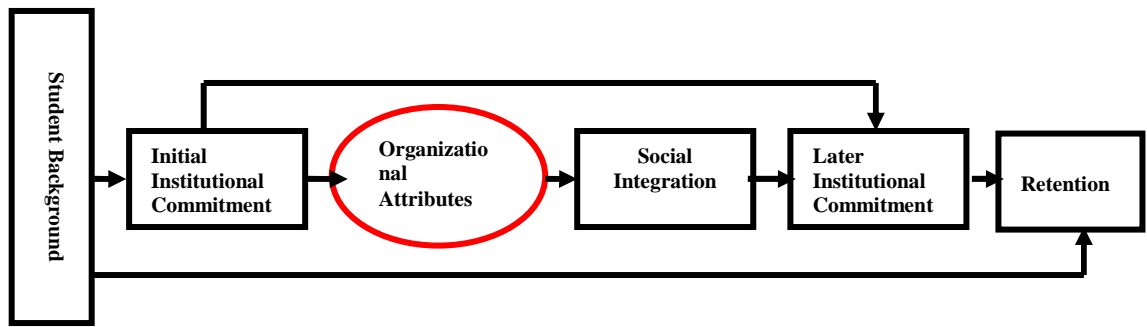


Figure 2.14 A Path Diagram of the Impact of Organizational Attitudes within Tinto Model

Using a Path Analysis technique, the results indicated that the variables in the model explained 44 percent of the variance in student retention. Regarding the effect of background characteristics, only sex and race had direct effects on initial institutional commitment. Females (0.10) and white (0.10) students had high levels of institutional commitments. While most of the background characteristics indirectly affect intent to persist, only race had a direct effect on intent to persist. Non-white students (-0.09) were more likely to intend to persist than White students.

Initial institutional commitment had no direct or indirect impact on social integration measures and later institutional commitment. Both measures of social integration had a direct effect on later institutional commitment (Peer = 0.50, Faculty= 0.09). Peer relations had a direct and indirect effect on intent to persist (0.17 and 0.25, respectively). Faculty relations impacted intent to persist only indirectly (0.05). Later institutional commitment positively predicted intent to persist (0.49).

Regarding the effects of organisational attributes on student social integration, the results indicated that the organizational attributes exerted

not only direct effects on social integration, but also indicated important indirect effects on students' intent to persist. The researcher suggested that organisational attributes play an important role in the process of student social integration and retention.

Bray, Braxton, and Sullivan (1999) suggested that how students cope with stress may be used to explain student social integration. Therefore, it was placed between initial institutional commitment and social integration (Figure 2.15).

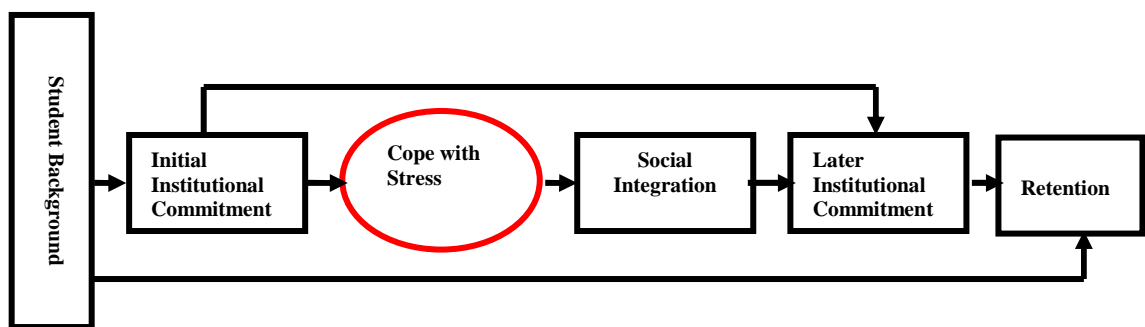


Figure 2.15 A Path Diagram of the Impact of Cope with Stress within Tinto Model

Using the Path Analysis technique, the results indicated that the model explained 38 percent of the variance in intent to persist. Most of the background variables were found to directly predict initial institutional commitment. In addition, most of these background variables directly and indirectly impacted on intent to persist. However, these influences were small.

Initial institutional commitment had a direct impact on social integration and later institutional commitment (0.04 and 0.13, respectively). Social integration had a strong direct effect on later institutional commitment

(0.61) Moreover, social integration was found to directly and indirectly predict intent to persist (0.14 and 0.30, respectively). Later institutional commitment had the strongest direct effect on intent to persist (0.50).

Regarding the influence of stress on student social integration, it was found that how students deal with stress affected their level of social integration.

Braxton, Bray, and Berger (2000) suggested that faculty teaching skills such as organization, preparation, and clarity may be used to explain student social integration. It was hypothesized that students who take courses from faculty members who frequently exhibit such skills may be more likely to participate in the social communities of their university because they feel more confident and relaxed about their academic achievement. Therefore, it was placed between initial institutional commitment and social integration (Figure 2.16).

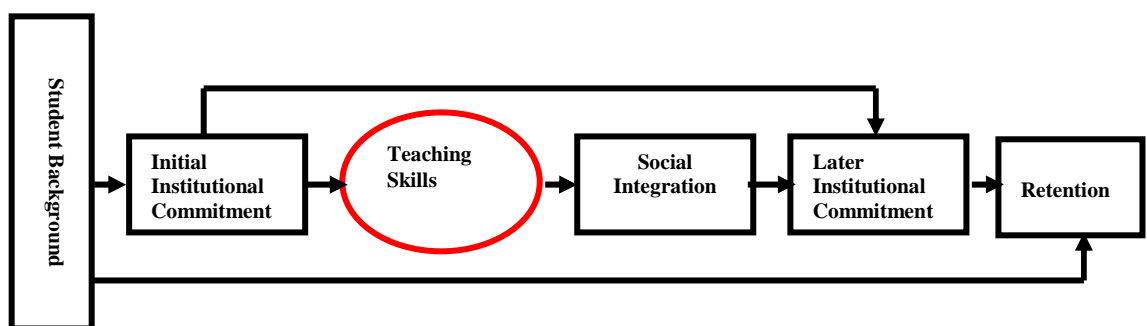


Figure 2.16 A Path Diagram of the Impact of Faculty Teaching Skills within Tinto Model

Using the Path Analysis technique, the results indicated that the model explained 38 percent of the variance in intent to persist. Most of the background variables were found to directly predict initial institutional

commitment. In addition, most of these background variables directly and indirectly impact intent to persist. However, once again these influences were small.

Initial institutional commitment did not influence social integration but it did influence later institutional commitment (0.113). Social integration had a strong direct effect on later institutional commitment (0.42). Moreover, social integration was found to directly and indirectly predict intent to persist (0.133 and 0.31, respectively). Later institutional commitment had the strongest direct effect on intent to persist (0.51).

Regarding the effects of faculty teaching skills on student social integration, it was found that students who had instructors that demonstrated increased levels of organization and preparation along with higher levels of instructor skill and clarity were predicted to participate more in the social communities of the university. This study suggested that the classroom is a complex source of social integration and that basic teaching skills impact on how students participate in the social community of the university.

Braxton, Milem, and Sullivan (2000) suggested that the classroom constitutes one possible source of influence on social integration. Tinto (1997) contends that if social integration is to occur, it must occur in the classroom. Faculty use of active learning practices constitute another possible source of influence on social integration. Active learning is any class activity that 'involves students in doing things and thinking about the

things they are doing' such as discussion, debates, and role playing (Bonwell and Eison, 1991 cited in Braxton *et al.*, 2000, p 571). It was hypothesized that a student who frequently experiences active learning in class may have more time to become socially integrated in the university because they feel that they are able to spend less time on studying for examinations. As a result, it was placed between initial institutional commitment and social integration (Figure 2.17).

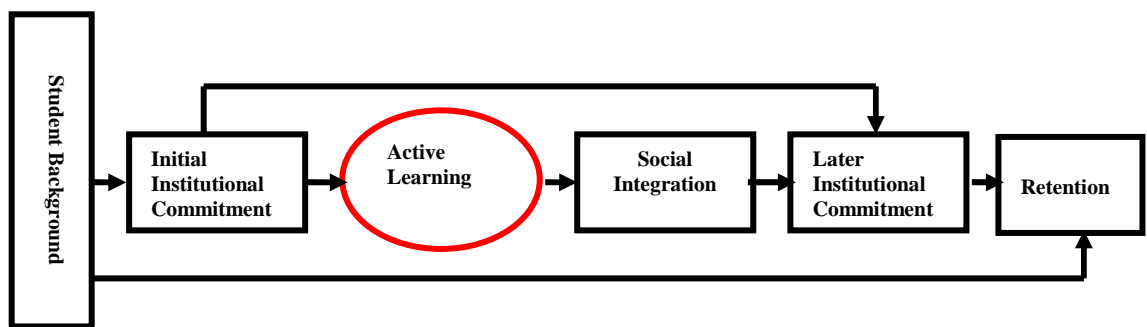


Figure 2.17 A Path Diagram of the Impact of Active Learning within Tinto Model

Using a Path Analysis approach, the results showed that the model explained 39 percent of the variance in the dependent variable. Regarding the effects of students' background characteristics, all background characteristics directly predicted initial institutional commitment with the exception of parental income. In addition, all the variables had a significant indirect effect on intent to persist with the exception of parental education level and SAT score.

Initial institutional commitment was found to have no direct or indirect effects on social integration. Initial institutional commitment had a direct effect on later institutional commitment (0.12) while social integration had

a strong direct effect on later institutional commitment (0.61). In addition, social integration had a direct and indirect effect on intent to persist (0.14 and 0.21, respectively) Later institutional commitment had the strongest direct effect on intent to persist (0.49).

Regarding the effects of active learning variables on social integration, the results indicated students who frequently experienced active learning in classes were predicted to spend more time on social integration at university. The researchers suggested that active learning in a classroom play an important role in the process of student social integration in particular and student retention in general. They also suggested that active learning should be used as a source of student social integration.

In general the results from the above studies were consistent with Tinto's model and also successfully explained the sources and the influences of social integration. However, these studies used the same dataset collected in a single institution. Moreover, the measure of retention is not a true measure because it only reflects student's assessment of the likelihood they will persist or leave.

The above studies have tested Tinto model at American Higher Education Institutions. One study has tested the predictive validity of the Tinto model at UK Higher Education Institutions. Brunsden, Davies, Shevlin, and Bracken (2000) conducted a study on two separate courses: a BA Computer Studies course at an English University and a BA Psychology course at a Scottish University. The data was obtained from 264 freshman

students using a questionnaire completed in the first two weeks after enrolment. This questionnaire was designed to collect student background characteristics and to assess their initial goal and later commitments, and their social and academic integration. Student background characteristics included sex, GCE A-level scores, three scales measuring personality, self-esteem, and satisfaction with life, and one item measuring whether a student was the first member of his family to attend university.

Academic integration was measured by two items: 1) Do you prefer to rely on handouts or on the notes you take yourself?; and 2) On your course, what do you expect the percentage split to be between self-directed study and taught input? Social integration was measured by two items: 1) Do you prefer to study alone or as part of a group?; and 2) Do you prefer to be assessed individually or as part of a group? Initial goal commitment was also measured by two items: 1) How sure are you that you made the right choice in attending this university?; and 2) How satisfied do you think you will be with the final outcome of your degree course? Initial institutional commitment was measured by one item: Was the degree subject that you are currently studying your first choice? Retention was defined as any student who re-enrols and remains on the course. It was collected at the end of the freshman year.

Structural equation modelling was used to analyse the data. The researchers found that the model did not provide an acceptable description of the data as suggested by the goodness of fit indices ($\chi^2=$

347.38; $df= 58$; $p < 0.05$; $GFI= 0.85$; $RMSEA = 0.85$; $CN = 56$). They concluded that Tinto's model may not be the most appropriate for predicting student retention.

However, the results should be interpreted with caution because this study has several limitations. First, social and academic integration were collected in the first two weeks of the course. As a result, actual levels of integration were not measured. Second, later goal and institutional commitments were not included in the model. Finally, structural equation modelling was conducted with small sample ($n=264$). This method requires a large sample size in order to get reliable and meaningful parameter estimates (Hair *et al.*, 1998).

In summary, there are many variations in how the researchers have tested Tinto's model in residential institutions. These variations can be grouped into the following:

- Researchers tested the whole model
- Researchers tested the whole model with the addition of other constructs
- Researchers tested parts of the model
- Researchers tested parts of the model with the addition of other constructs.

A number of general conclusions can be made. First, it would appear that Tinto's model has reasonable predictive validity in explaining variance in student retention. Second, the influences of students' background characteristics on retention are indirect, mediated by their social and

academic integration. Third, student's integration and later commitments appear to be more important in predicting student retention than student's background characteristics and initial commitments. Fourth, academic and social integration appear to be important in predicting student retention. In addition, there appear to be gender differences. Academic integration seems to be a strong predictor of retention for males whereas social integration seems to be a strong predictor of retention for females. Finally, later goal and institutional commitments appear to be most important in predicting student retention. In addition, later institutional commitment seems to be the strongest predictor of student retention among all Tinto's constructs.

2.3.2 Studies testing Tinto's theory in commuter institutions.

The previous section reviewed studies that tested Tinto's model in residential institutions. In this section, studies that tested Tinto's model in commuter institutions will be reviewed, although it was developed to explain student retention in 4-year residential institutions. The first study was conducted by Pascarella, Duby, and Iverson (1983) to determine the explanatory power of Tinto's model in a commuter university and also to extend the model by considering an additional construct termed "intention".

Data were collected from 269 freshman students using two questionnaires. The first questionnaire was completed during the first month of the first semester to collect students' background characteristics

and to assess their initial commitments. Background characteristics included pre-college schooling, individual attributes and family background. Pre-college schooling was measured by high school scores. Individual attributes were measured by sex, race, intended major, and academic aptitude score. Family background was measured by asking students about their parents' formal education and parental financial support for college. Initial goal commitment was measured by one item asking students about their highest expected academic degree. Initial institutional commitment was measured by two items asking students about their satisfaction with their first year experiences and to what extent they believed they persist at the university.

The second questionnaire was mailed to students during the second semester to assess academic integration, social integration, later commitments and intention. Academic integration was measured by freshman GPA, frequency of non-class contacts with faculty to discuss course related matters and to get advice about a program, an academic and intellectual development scale and a faculty concern for teaching and student development scale. Social integration was measured by frequency of non-class contacts with faculty to socialize informally and to discuss a campus issue, an informal relations with faculty scale and a peer group relations scale. Later goal commitment was measured by two items asking students about the importance of graduating from college in general and their highest expected academic degree. Later institutional commitment was measured by two items asking students about the importance of

graduating from this college and their confidence in having made the right college choice. Intention was measured by one item asking students about their likelihood of enrolment next year. The dependent variable, retention, was defined as whether or not students were enrolled the following year. It was obtained from the university admission office.

Using a hierarchical regression analysis to assess which of the five sets of predictors (background characteristics, initial commitments, integrations, later commitments, and intention to persist), made a significant contribution to the prediction of student retention, it was found that background characteristics made the largest significant contribution (9.9%), followed by intention (9.2%) and integration (6.3%).

Path Analysis was employed to test the predictive validity of Tinto's model. The results indicated that the model without intention explained 19 percent of the variance in student retention. The addition of intention increased the variance explained to 28.2 percent.

Regarding the effects of background characteristics on initial commitments, it was found that students who were male (-0.14), who were non-white (-0.15), who performed better in SAT test (0.22) and whose parents were educated (0.21) were predicted to have high levels of goal commitment. Female students (0.14) were predicted to have high levels of institutional commitment. In addition, sex, high school and SAT grades were found to have significant direct effects on retention. Students who were females (0.27), who performed better in SAT (0.17) and who did not

perform well in high school (-.012) were predicted to persist. Although the simple correlation between high school and retention was positive, the negative effect of high school on retention may be due to collinearity among predictors and as such should be interpreted with caution.

Initial goal commitment did not have any effect on either academic or social integration whereas initial institutional commitment (0.13) had a direct effect on academic integration. Both initial commitments directly predicted later commitments. Initial goal commitment (0.33) influenced later goal commitment and initial institutional commitment (0.22) influenced later institutional commitment.

Regarding the effects of integrations on later commitments, only academic integration (0.36) had a direct effect on later institutional commitment. In addition, both integrations were found to have direct impact on retention. However, academic integration had a positive effect while social integration had a negative effect. In other word, students who were more academically integrated (0.31) or who were less socially integrated (-0.25) were predicted to persist.

Neither later goal nor institutional commitments had a direct influence on student retention. Regarding the role of intention within Tinto's model, it was found that intention (0.34) had the strongest direct effect on retention.

The researchers suggest a reconceptualization of Tinto's model in non-residential universities, where student background characteristics may

have a stronger direct effect on student retention, and academic integration is considered to be more important relative to social integration.

Fox (1986) tested the validity of Tinto's model for urban students with economically and academically disadvantaged backgrounds. Data were obtained from 435 freshman students on two occasions: during the first semester and during the second semester. The data collected during the first semester were student background characteristics and initial commitments. Background characteristics included pre-college schooling, individual attributes and family background. Pre-college schooling was measured by secondary school grades and skill assessment tests in mathematics, reading and writing. Individual attributes were measured by sex and ethnicity. Family background was measured by parental education, number of hours worked on job and concern about finances. Initial commitments were measured using Pascarella and Terenzini's (1980) scale.

The data collected during the second semester concerned academic and social integration, later commitments and intention to persist. Academic integration was measured by grade point average, proportion of courses passed, number of class withdrawals, frequency of non-class contacts with faculty for academic reasons, number of contacts with counsellors for academic reasons, number of hours tutored, and two scales developed by Pascarella and Terenzini's (1980) study. Social integration was measured by frequency of non-class contacts with faculty for social or personal

reasons, number of contacts with counsellors for personal reasons and two scales developed by the same study. Later commitments were measured using Pascarella and Terenzini's (1980) scale. Retention was defined as whether or not students were enrolled the following year.

Using a hierarchical regression analysis, the results indicated that the model explained 31 percent of the variance in student retention. Of the five sets of predictors (background characteristics, initial commitments, integrations, later commitments, and intention to persist), only two, social and academic integration (24.3%), and intention to persist (2.0%), made a significant contribution to predicting student retention.

The result from multiple regression indicated that only three variables were found to influence student retention. Academic integration had the greatest influence (0.56). Social integration negatively predicted retention (-0.28) while intention to persist positively predicted retention (0.18). The negative influence for social integration on retention was also found by Pascarella *et al.* (1983). The researcher explained that students for whom social integration is very important do not get sufficient opportunities and are likely to seek it at a residential university.

Allen and Nelson (1989) tested Tinto's theory among 265 female students at 4-year and 2-year institutions. Student background characteristics were obtained from the university admission office. These characteristics included parents' combined income, SAT composite scores and percentile rank in graduating class.

Social integration was measured by student activities during the freshman year, frequency of non classroom contacts with faculty and two scales from Pascarella and Terenzini (1980) (faculty relations and peer relations). Academic integration was measured by freshman GPA, frequency of non classroom contacts with faculty and two scales from Pascarella and Terenzini (1980) (faculty concern for teaching and student development, and academic development). Later commitments were measured using the institutional/goal commitment scale developed by Pascarella and Terenzini (1980). Intention was measured by a single item asking students about the likelihood of their enrolment next year. The integrations and commitments data were obtained at the end of the freshman year. GPA data was taken from the university admission office. Initial commitment was not measured because the data were collected at the end of the freshman year. Retention was defined as whether or not students returned for the second year. It was obtained from the university admission office.

Path Analysis was used to test the model. The results of this study generally supported the predictive validity of Tinto's model. The findings were presented for a pooled sample, a 2-year sample, and a 4-year sample. For the pooled sample, the model explained 44 percent of the variance in retention. Background characteristics did not have any significant effects on retention. Social integration had a direct effect on later goal and institutional commitment (0.23 and 0.38, respectively) Academic integration only had a direct effect on institutional commitment (0.15) while both commitments did not have any direct effects on retention.

The only variable which did have a direct effect on retention was intention (0.66).

For the 2-year women's college, the model explained 53 percent of the variance in retention. Background characteristics did not have any significant effects on retention. Social integration had only a direct effect on later institutional commitment (0.36) whereas academic integration failed to have any effect. Both commitments did not have any direct effects on retention. Two variables did have direct effects on retention. Intention had a positive effect (0.74), while academic integration had a negative effect. In other words, students who were more academically integrated were more likely to leave the institution. The explanation of the negative effect of academic integration indicated that female students who were more academically integrated were more likely to transfer to a four-year institution where opportunities for academic involvement were more consistent with their expectations.

For the 4-year women's college, the model explained 44 percent of the variance of retention. Background characteristics did not have any significant effects on retention. Social integration had a direct effect on later goal and institutional commitment (0.29 and 0.41, respectively). Academic integration failed to have any effect on commitments. Both commitments did not have any direct effects on retention. The only variable which had a direct effect on retention was intention (0.70).

Some researchers have tested Tinto's model with the addition of other constructs to improve the explanatory power of the model. Braxton, Duster, and Pascarella (1988) conducted a study to examine the effect of academic advising within Tinto's model. The researchers hypothesized that students with varying levels of initial commitments engage in the academic advising process to a varying degree. In turn, varying levels of engagement in the process of academic advising lead to varying levels of academic and social integration. Therefore, they placed academic advising between initial commitments and integrations (Figure 2.18).

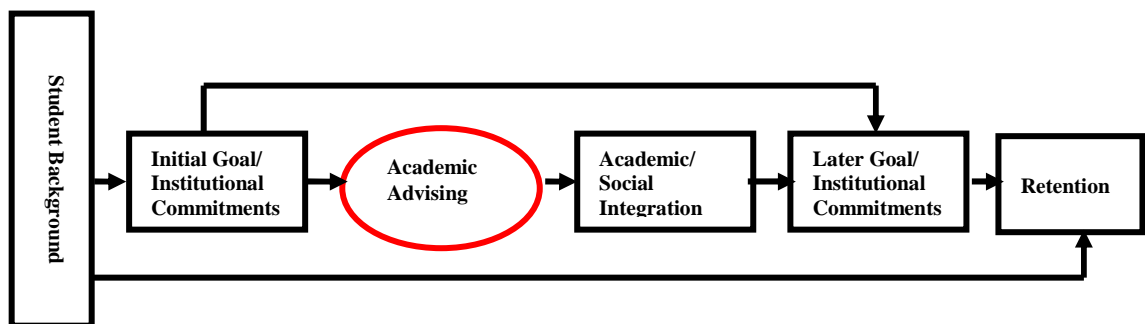


Figure 2.18 A Path Diagram of the Impact of Academic Advising within Tinto Model

Data were obtained from 104 freshman students. Student background characteristics and initial commitment data were collected in the first semester of the freshman year. Integration and later commitment data were collected during the summer of the freshman year using Pascarella and Terenzini's (1980) scales. Retention was defined as whether or not students were enrolled in the following year and it was taken from the university admission office.

Path Analysis was performed to analysis the data. The results indicated that the model explained only 19 percent of the variance in retention. None of the background variables had effects on initial goal commitment. Moreover, only one variable negatively predicted initial institutional commitment. Students who scored low on the ACT composite score (-0.22) were predicted to have high levels of initial institutional commitment in addition, only one background variable had a negative direct effect on retention. Non-white students (-0.25) were more likely to persist than white students.

Initial goal commitment (-0.15) negatively influenced academic integration but did not influence later goal commitment. On the other hand, initial institutional commitment did not influence any kinds of integration but positively (0.20) influenced later institutional commitment.

Academic integration (0.23) had a direct effect on later institutional commitment whereas social integration failed to have any influence on later commitments. In addition, both types of integrations failed to have any influence on retention. Later goal commitment had no effect on retention while later institutional commitment had the strongest effect (0.32).

Regarding the effect of academic advising, it was found that academic advising did not have a direct effect on social integration and retention. However, it had a direct effect on academic integration. In other words, the

greater the level of student-advisor interaction, the higher the level of academic integration.

Using the same dataset, Braxton, Brier, and Hossler (1988) conducted a study to compare the effects of student problems, which are often cited by students as reasons for leaving, with the effects of constructs derived from Tinto's model. Students face many problems while attending college. These problems include difficulty taking desired courses; difficulty balancing academic workload with demands at home or work and personal problems. Student problems were placed between initial commitments and integrations (Figure 2.19).

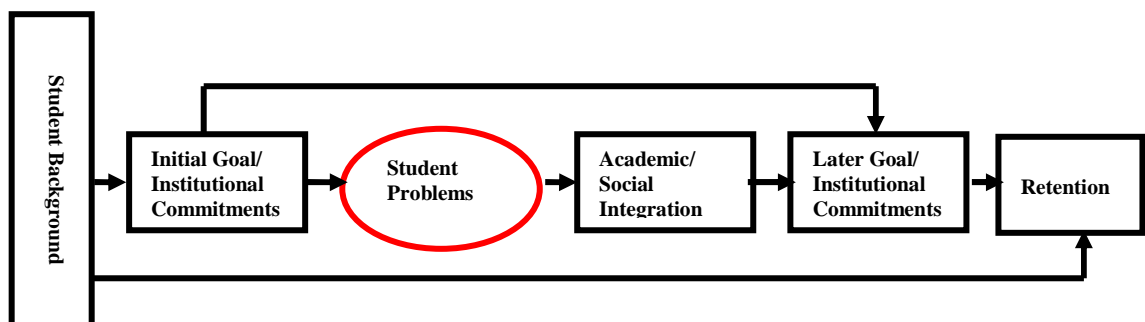


Figure 2.19 A Path Diagram of the Impact of Student Problems within Tinto Model

Multiple linear regressions were used to analysis the data. The results indicated that only later institutional commitment (0.29) had a positive effect on student retention. Regarding the effect of student problems, it was found that student problems exerted no influence on student retention. This study suggested that reasons given by withdrawing students should not be accepted as primary reasons for student attrition because they may not reflect the underlying reasons for withdrawal.

Using the same dataset, Braxton and Brier (1989) conducted a study to estimate the effects of organizational attributes on student retention in a causal sequence using the constructs of Tinto's model. Organizational attributes include communication, fairness in the administration of policies and rules and participation in organizational decision making. The researchers hypothesized that varying levels of initial commitments lead to varying levels of familiarity and interaction with various organizational attributes of the institution. In turn, these organizational attributes lead to varying levels of academic and social integration. Therefore, they placed the set of organizational attributes variables between initial commitments and integrations (Figure 2.20).

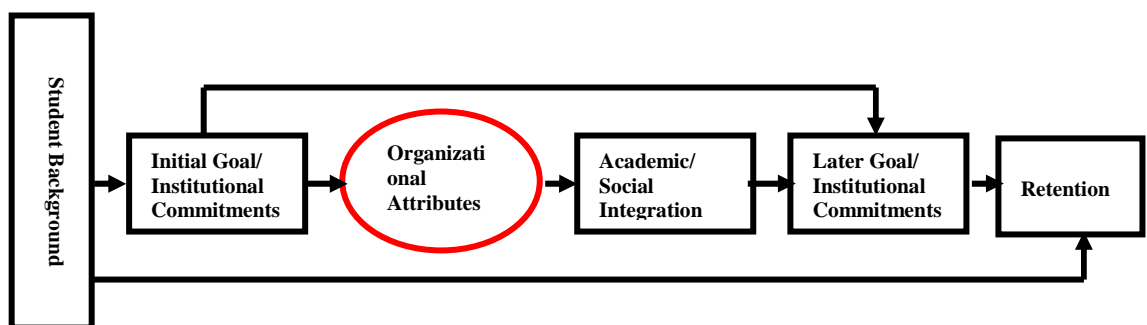


Figure 2.20 A Path Diagram of the Impact of Organizational Attributes within Tinto Model

Path Analysis was used to analysis the data. The results indicated that the model explained 20 percent of the variance in student retention. None of the background variables had significant effects on either initial commitments or retention.

Both initial commitments failed to predict either type of integration. Initial institutional commitment (0.204) positively predicted later institutional commitment whereas initial goal commitment did not predict later goal commitment.

Regarding the effects of integration on later commitment, social integration did not predict any kind of later commitments while academic integration (0.333) positively predicted only later institutional commitment. In addition, both type of integration failed to predict student retention. Moreover, it was found that only later institutional commitment (0.303) had a significant direct effect on student retention.

In relation to the effects of organizational attributes on student retention, it was found that these exerted no direct or indirect influence on student retention. However, this factor was found to positively predict both types of integration. However, the above studies were conducted at the same institution using a very small sample size ($n=104$). Therefore, the findings should be interpreted with caution.

Cabrera, Nora and Castaneda (1992) tested parts of Tinto's model with the addition of other constructs from other models such as Bean's model and Cabrera *et al's* model. The purpose of their study was to explore the role of finances within Tinto's model. Data were obtained from 466 freshman students. During the second semester, students were mailed a questionnaire to collect academic integration, social integration, later

goal commitment, later institutional commitment and intention to persist data.

Academic integration was measured by GPA and the academic and intellectual development scale developed by Pascarella and Terenzini (1980). Social integration was measured by the peer-group relations scale developed by the same researchers. Goal commitment was measured by two items assessing the importance of a college degree and the importance of completing a program of study while institutional commitment was measured by eight items assessing feelings of belonging at the institution, confidence of institutional choice, importance of graduating from the institution, the practical value of the education, and institutional prestige. Intention to persist was measured by one item borrowed from Pascarella and Terenzini (1979). Other data were obtained from the university admission office at the end of the second semester to collect high school rank, GPA, financial aid and retention status. Retention was determined by whether or not students had returned for second year.

Structural equation modelling was employed to analyse the data. The results indicated that the model accounted for 47 percent of the variance observed in retention. The chi-square was non-significant ($\chi^2= 18.14$, $df= 18$; $p= 0.447$). Other fit statistics were within the acceptable values (GFI= 0.996; AGFI= 0.985; RMSEA= 0.035), indicating that the model fits the data well.

Only high school rank was measured as an indicator of background characteristics. The effects of school rank on initial commitments were not estimated because initial commitments were not measured in this study. High school rank did not have a direct effect on retention.

Academic and intellectual development scales as an indicator of academic integration had a direct effect on later goal commitment (0.207). Social integration had a direct effect on later institutional commitment (0.319). while GPA was found to have a direct effect on retention (0.263).

Both later commitments had no direct effect on retention but had direct effects on intention to persist. The largest direct effect was exerted by institutional commitment (0.308) followed by goal commitment (0.185). Intent to persist positively predicted retention (0.595).

Regarding the role of finances in predicting retention, the results indicated that financial aid did not have a direct effect on retention. However, it was found that students who received some form of financial aid were predicted to engage in social and academic activities.

In summary, although Tinto's model was developed to predict student retention at residential institutions, the model appears to function effectively in commuter institutions. Students' background characteristics appear to be more important in predicting student retention than student social and academic integration in addition academic integration seems to be a more important predictor of retention than social integration.

2.3.3 Studies testing Tinto's theory across different types of institutions

In this section studies testing Tinto's model across different types of institutions will be reviewed. The first study was conducted by Munro (1981). She used the US National Longitudinal Study of the High School Class of 1972 to obtain a sample of 6,018 full-time students entering four-year colleges. Student background characteristics included sex, aptitude, locus of control, self-esteem, high school achievement and student and parental educational aspirations.

Social integration was measured by one item asking students about their satisfaction with the social life on campus while academic integration was measured by one item asking students about their satisfaction with their intellectual development and their college grade point average.

Later goal commitment was measured by one item asking students about their educational plans, while later institutional commitment was measured by asking one item about satisfaction with faculty and satisfaction with the development of employment skills. Commitments were measured at the end of the freshman year. Retention was measured by two variables: retention in the specific institution and retention in higher education in general. Retention in the institution was defined as whether or not students had remained within the original institution, while retention in higher education was defined as whether or not students remained in the higher education system four years later.

Using a Path Analysis technique, the results indicated that the variables in the model explained only 14 percent of the variance in retention. The model did not support most of Tinto's hypotheses

The researcher measured student's educational aspiration which is similar to initial goal commitment. However, initial institutional commitment was not measured. Regarding the effect of students' background characteristics on students' educational aspirations sex (0.049), ethnicity (-0.049), aptitude (0.182) and self-esteem (0.055) all had direct effects on students' educational aspirations. Those students who were female, who were white, who had high grades in the Aptitude test and who had high levels of self-esteem were predicted to have high levels of educational aspirations or initial goal commitments. Among the background variables only high school grades had a direct and indirect influence on retention in higher education (0.062 and 0.084, respectively).

Educational aspirations had no direct effect on either social or academic integration although educational aspirations were found to directly and indirectly impact later goal commitment (0.171 and 0.137 respectively).

Regarding the effects of integration on later commitments, it was found that academic integration had a direct effect on later goal and institutional commitments (0.224 and 0.485, respectively). On the other hand, social integration had a direct effect only on later institutional commitment (0.191). In addition both types of integration had a significant influence on retention in the institution. However, social integration had a positive effect

(0.076) while academic integration had a negative effect (-0.068). Moreover, academic integration positively predicted retention in higher education (0.156).

Regarding the effects of later commitments on retention, later goal commitment had a direct effect on retention in higher education (0.212), whereas later institutional commitment did not.

Although Munro's study was based on multi-institutional data, the results were not disaggregated by institutional type. As a result, it is difficult to determine if the results are consistent for different types of institution. Therefore, Williamson and Creamer (1988) replicated and extended Munro's study by testing Tinto's model using both 2- and 4-year college student populations.

The researchers used the National Longitudinal Study of the High School Class of 1980 to obtain a sample of 974 2-year college students and 2,969 4-year college students. Similar to Munro's study, initial commitments were not measured in this study. However, student educational aspiration can be used as indicator of initial goal commitment.

Path Analysis was used to analysis the data. The findings were presented by institutional type and by the two measures of retention, outlined above related to retention at the specific institution and in higher education in general. The results indicated that the path models for the 2-year students explained 19.0 percent of the variance in retention in higher education and 6.7 percent of the variance in retention in the institution. In comparison,

the path models for the 4-year students explained 16.8 percent of the variance in retention in higher education and 11.3 percent of the variance in retention in the institution.

For the 2-year sample using retention in higher education, none of the background characteristics had a significant effect on student educational aspirations. Only locus of control (-0.085) had a significant impact on retention in higher education. A student's educational aspirations had direct effects on academic integration and later goal commitment (0.074 and 0.276, respectively). Academic integration positively predicted later goal commitment and retention in higher education (0.120 and 0.110 respectively) while social integration did not have any effect on either later commitments or retention in higher education. Later goal commitment did have a significant effect on retention in higher education (0.325) whereas later institutional commitment did not.

For the 2-year sample using retention in the institution, none of the background characteristics had significant effects on either educational aspirations or retention. Educational aspirations did not influence either social or academic integration but it positively influenced later goal commitment (0.268). Academic integration had a significant influence on later goal commitment and retention (0.118 and 0.091 respectively). Social integration did not have any effect on later commitments but negatively predicted retention (-0.117); while later goal commitment positively predicted retention (0.156) and later institutional commitment did not.

For the 4-year sample using retention in higher education, none of the background characteristics influenced educational aspirations. However, four background characteristics had significant direct effects on retention in higher education. Student who were female (0.04), who had higher Socio-Economic Status (SES) (0.103), who performed well in high school (0.085) and SAT (0.076) were predicted to persist in higher education. Educational aspiration did not influence social or academic integration but it positively influenced later goal commitment (0.268). Academic integration had significant effects on later goal and institutional commitments, (0.072 and 0.556 respectively), while social integration had a significant effect only on later institutional commitment (0.212). Neither social nor academic integration had any effect on retention in higher education. Finally, later goal commitment positively predicted retention in higher education (0.309), while later institutional commitment did not.

For the 4-year sample using retention in the institution, none of the background characteristics had a significant effect on educational aspirations and only two background variables had a direct influence on retention. Students who had higher SES (0.048) and who performed well in high school (0.123) were predicted to persist in the institution. Educational aspirations did not have any impact on social or academic integration but had a direct effect on later goal commitment (0.283). Academic integration predicted later goal commitment (0.089) while social integration did not. Moreover, while both academic and social integration

predicted retention, (0.076 and 0.077 respectively); later goal commitment predicted retention (0.234) while later institutional commitment did not.

This study indicated that background characteristics may be more influential than social and academic integration in predicting long-term persistence. On the other hand, social and academic integration may be more influential than background characteristics in predicting short-term persistence. Both Munro's and the Williamson *et al.* studies found that later goal commitment had the strongest direct effects on persistence whereas later institutional commitment failed to have any effect. One explanation of this finding might be due to the lack of an adequate measure to assess institutional commitment.

Pascarella and Chapman (1983b) have questioned the extent to which the variables from the National Longitudinal Sample of the High school provided adequate operational definitions of Tinto's constructs, especially social and academic integration. As a result, they conducted a study to test Tinto model across different institutions using multiple measures of social and academic integration. Data were obtained from 2,326 first-time freshman students at 11 different institutions, including 4 four-year public or private residential universities, 3 two-year commuter community colleges, 2 commuter four-year institutions and 2 private liberal arts colleges with a mix of residential and commuter students.

Data were collected during the second semester. As a result, initial commitments were not measured. Students were mailed a questionnaire

to collect students' background characteristics and to assess their later commitments and integrations. Background characteristics included sex, age, secondary school achievement, academic major, socioeconomic status and some personality dimensions. Later goal commitment was measured by one item asking students about the importance of graduating in general. Later institutional commitment was measured by two items asking students about the importance of graduating from this university and their confidence in having made the right university choice.

Academic integration was measured by first semester grade point average, expected grade point average for the second semester, academic/ intellectual activity, honours program participation, special skills program participation, informal contact with faculty to discuss academic concerns, peer conversations to discuss academic concerns, and career panning program participation. The variables to measure social integration were residential status, average number of dating each month, number of best friends on campus, participation in organized student extracurricular activities, participation in informal social activity, number of weekends spend on campus each month, friendships, peer conservations to discuss social and personal concerns, and informal contact with faculty to discuss social and personal concerns. Retention was defined as re-enrolment for the sophomore year.

Multiple regression analyses were conducted for each type of institution. The results indicated that all background characteristic variables were not

related to retention across all four types of institutions except one dimension of the personality attribute (affiliation needs) in two-year commuter universities. Drop-out students in two-year commuter colleges had significantly higher levels of affiliation needs (-0.124) than persister students.

Regarding academic integration measures, only three measures had significant effects on student retention for two institutional types. For residential university students, participation in a special skills program (-.0.087) was negatively associated with retention while participation in a career planning program (0.068) was positively related. For four-year commuter university students, only expected second semester grade point average (0.218) was positively related to retention. None of the academic integration measures had significant effects on retention for liberal arts colleges and two-year commuter colleges.

Regarding social integration measures, four measures had significant effects on retention for three institutional types. For residential university students, living on campus (0.112) and friendships (0.071) had significant effects on retention. For four-year commuter university students, only dating frequency (-0.109) had a negative effect on retention. For two-year commuter students, friendships (0.108) had a positive effect while peer conversations to discuss social and personal concerns (-0.137) had a negative effect on retention. For liberal arts college students, none of the social integration measures had significant effects on retention.

Regarding the effects of later commitments on retention, it was found that later institutional commitment was positively related to retention in the liberal arts colleges (0.291) the four-year commuter (0.253) and residential universities (0.305). Goal commitment had a positive effect on retention for residential (0.07) and two-year commuter colleges (0.328). However, the relationships between variables in Tinto's model were not estimated because the data were analyzed using a regression method.

As a result, using the same dataset Pascarella and Chapman (1983a) conducted another study to test the validity of Tinto's model in three different types of institutions: 4-year residential institutions, 4-year commuter institutions, and 2-year commuter institutions using a Path Analysis technique.

The study found that Tinto's model explained a small proportion of the variance in retention (from ranged from 11 to 15 percent). The researchers suggested the small explained variance may be due to inadequate measures of the variables in Tinto's model or some important predictors of student retention may not be specified in Tinto's model.

The Path Analysis of the pooled sample was consistent with Tinto's theoretical expectations. The effects of most of the background characteristics were mainly indirect through social and academic integration and goal and institutional commitments. Social and academic integration had indirect effects through later goal and institutional

commitments, while later goal and institutional commitments had direct effects on retention.

When the data were disaggregated by institutional types, three major differences were indicated. The first was the effect of background characteristics. For students in residential institutions, the effects of background characteristics on retention were largely indirect, mediated through social integration, commitments, and living on campus. Conversely, for students in 2- and 4-year commuter institutions, background characteristics had direct effects on retention.

A second difference was in the role played by academic and social integration. For students in residential institutions, social integration had a significant direct effect on retention and an indirect effect through later goal and institutional commitment. On the other hand, academic integration had no effect on retention either directly or indirectly. For students at 2 and 4 year commuter institutions, the influence of academic integration on retention was indirect through later institutional commitment. Conversely, social integration had no direct or indirect effect on retention.

A third difference was in the relative contributions of later goal and institutional commitments. For students in 4 year residential and commuter institutions, later institutional commitment had a much stronger direct effect on retention than later goal commitment, while later goal commitment for students in 2 year commuter institutions had a somewhat stronger direct effect on retention than later institutional commitment. This

study indicates that the pattern of effects in Tinto's model may be different when employed at different institutional types.

Using a similar sample, Chapman and Pascarella (1983) conducted a study to examine the effect of institutional type and size on academic and social integration. Using discriminant analysis, the results indicated that the patterns of student social and academic integration differed significantly by institutional type and size. As institutional size increased, students' social life tended to centre more on campus social activities. This pattern may be due to the greater number of social opportunities available in larger institutions. In addition, as institutional size increased, students' informal contact with faculty either on social or academic matters tended to decrease. This pattern may be due to the assignment of teaching responsibilities. Freshman students may be taught primarily by graduate students.

In terms of the institutional type (residential v commuter), two main differences were found. First, students in residential institutions tended to have higher levels of both academic and social integration. While students in commuter institutions tended to be less involved in campus-based academic activities. Second, students in 4-year institutions participated more in social life of their institution. In addition, they had more informal contacts with faculty in academic matters than their peers in 2-year institutions. This study provides evidence of the importance of both

student personal and institutional characteristics in determining whether or not a student becomes integrated into the institution.

Previous research has tested Tinto's model on ethnic majority students. Consequently, Donovan (1984) conducted a study to test Tinto's model among a sample of 403 low-income black youths attending a variety of institutions. Students' background characteristics and their educational aspirations were collected prior to college entry. Background characteristics included parental education, family income, aptitude, and high school grade. Educational aspiration was measured by a single item asking students about how many years they wanted to stay in college.

Academic integration was measured by a 12-item scale and freshman cumulative GPA. Social integration was measured by a nine-item scale. Integration data were collected during the second semester of the freshman year. Retention was collected at the end of the sophomore year and it was defined as whether or not a student had remained enrolled in college for two years.

Using a Path Analysis, the results indicated that the model explained 32 percent of the variance in retention. Regarding the effects of background characteristics on student's educational aspiration, high school grades (0.11) and aptitude (0.19) had direct effects. However, only parental education (0.16) positively predicted retention. Student's educational aspirations failed to predict social or academic integration.

The effects of academic and social integration on later commitments and the effects of later commitments on retention were not estimated because later commitments were not measured. The strongest predictors of retention were accounted for by freshman cumulative GPA (0.47) followed by academic integration (0.14). However, social integration was found to predict retention but the researcher excluded it from the model because it was not predicted by any prior variable. This study suggested that retention of black students was largely the result of college experiences rather than background characteristics.

Previous research had studied student retention using Tinto's model over a relatively short period of time typically one or two years. Pascarella, Smart, and Ethington (1986) conducted a study in which student retention was measured after a nine-year period of time. Data were obtained from 825 freshman students enrolled in 85 two-year institutions who began their study at two-year institutions and aspired to continue to get a bachelors' degree or above after transfer to 4-year institution.

Student background information and initial commitments were collected in the first semester of the freshman year. Student integration and later commitment data were collected approximately nine years later. Persistence was measured by two variables: degree persistence and degree completion.

Structural equation modelling was employed and analyses were estimated separately for men and women. The results indicated that the model

explained 19.9 percent of the variance in degree persistence and 25.4 percent of the variance in degree completion for men. For women, the model explained 15.3 percent of the variance in degree persistence and 22.8 percent of the variance in degree completion.

The effects of student background on initial commitment were found to be significant for both sexes. For males, those students whose parents were more educated and wealthy (0.114), who participated in social and leadership activities during secondary school (0.145) and who performed better in secondary school tests (0.200) were predicted to have high level of initial goal commitment. In addition, male students predicted to have high level of initial institutional commitment were those who expected to work less during college (-0.20), who had not performed well in secondary school tests (-0.156) and whose parents were less educated and less wealthy (-0.196). For females, those students expected to major in liberal arts or sciences (0.162) were predicted to have high levels of initial goal commitment. In addition, female students who were predicted to have high levels of initial institutional commitment were those who expected to work less during college (-0.205), who did not participate in social and leadership activities in secondary school (-0.133) and who came from less educated and less wealthy families (-0.200).

In addition, few background variables positively predicted degree completion and persistence. Male students who performed well in secondary school (0.156) were predicted to complete their degree study

while female students who participated in social and leadership activities in secondary school (0.094) were predicted to complete their degree study. None of the background variables had a direct effect on degree persistence for male students. On the other hand, female students whose families were better educated and wealthier (0.121) were predicted to persist. For both sexes, both initial commitments failed to predict both types of integration and later commitments.

The effects of integrations on later institutional commitment were found to be significant only for men. Academic integration (0.246) was a stronger predictor than social integration (0.114). In addition, both types of integration positively predicted degree persistence and degree completion for both sexes. For men, academic integration (0.231) had a stronger direct effect on degree persistence than social integration (0.168). In addition, academic integration (0.223) had a stronger influence on degree completion than social integration (0.176). Similarly, for women, academic integration (0.257) had a stronger effect than social integration on degree persistence (0.149). Moreover, academic integration (0.280) had a stronger influence than social integration (0.103) on degree completion.

Later institutional commitment positively predicted degree persistence (0.196) and degree completion (0.211) only for men. This study suggests that Tinto's model is also reasonably useful in explaining the long-term persistence behaviour of students who begin their higher education in two-year institutions. In addition, this study supported the importance of social

and academic integration in predicting persistence. Students who initially enrolled in two-year institutions were more likely to either obtain or to persist in the pursuit of the bachelor's degree if they were successfully integrated into the academic and social systems of the institution.

Braxton, Vesper, and Hossler (1995) tested Tinto's model with the addition of student expectation for college. Tinto postulates that students enter college with expectations. If these expectations are met, then students are more likely to become integrated into the social and academic communities of the institution. Therefore, the researchers placed an expectation construct between initial commitments and integrations (Figure 2.21).

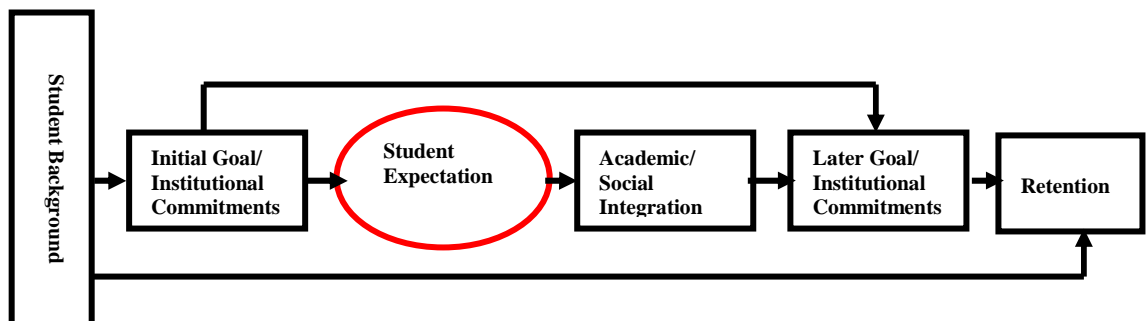


Figure 2.21 A Path Diagram of the Impact of Student Expectations for College within Tinto Model

Data were obtained from 263 freshman students who entered four-year colleges and universities using two questionnaires. The first questionnaire was completed by students when they were in high school. This questionnaire was designed to collect student background characteristics and their initial commitments. The second questionnaire was administered

during the second semester of the freshman year to assess their integration, commitments, their expectations for college and their intention to persist for the second year. Tinto's major constructs were measured using Pascarella and Terenzini's (1980) scales. Retention was determined as students' intent to persist.

Structural equation modelling was used to test the model. The results indicated that the model explained 23 percent of the variance in intention to persist. In addition the model was found to fit the data well. The chi-square was non-significant ($\chi^2=7.37$, $df=4$, $p<0.118$). The other fit statistics were within the acceptable values (GFI= 0.996, RMSEA=0.014).

None of the background variables had significant effects on initial commitments. Only parental socio-economic level positively influenced initial goal commitment (0.263).

Initial goal commitment did not have a direct or indirect effect on either types of integration. On the other hand, initial institutional commitment had only indirect effects on academic (0.069) and social integration (0.091). Moreover, initial goal commitment failed to influence later goal commitment either directly or indirectly; while initial institutional commitment had both direct (0.283) and indirect (0.102) effects on later institutional commitment.

Academic integration was found to have a direct, positive effect on both later goal commitment (0.146) and later institutional commitment (0.128). Social integration only had a positive direct effect on later institutional

commitment (0.178). Both later commitments positively predicted intention to persist, although later institutional commitment (0.393) had a stronger effect than later goal commitment (0.119).

Regarding the effects on student expectations, the result indicated that students whose expectations for college were met were more likely to become integrated into the academic and social communities of the institution. However, this study had two limitations; retention was not directly measured; and, high school grades and aptitude grades were not included in the model.

Braxton, Sullivan, and Johnson (1997) identified 15 testable propositions derived from Tinto's theory. These propositions are summarised in Table 2.1 and are displayed diagrammatically in Figure 2.22. Braxton *et al.* classified those propositions into: primary and secondary. The propositions from 1 to 13 were considered primary because they were integral to the longitudinal sequence in accounting for student departure decisions, while propositions 14 and 15 were considered secondary because they pertained to interactions between constructs in Tinto's theory. Braxton *et al.* further classified five of the 13 primary propositions as fundamental to Tinto's theory because they postulated a direct effect on student retention decisions (propositions 3, 12, 13), or because interactions between the student and the academic and social systems of a university were important in determining student retention (propositions 8, 9).

Table .2.1 Aggregated Magnitude of Support for Each Proposition by Multiple and Single Institutional Tests

Proposition	Multiple	Single
1. Student entry characteristics affect the level of initial commitment to the institution.	M	S
2. Student entry characteristics affect the level of initial commitment to the goal of graduating from college	S	M
3. Student entry characteristics directly affect the student's likelihood of persistence in college.	M	W
4. Initial commitment to the goal of graduating from college affects the levels of academic integration.	W	M
5. Initial commitment to the goal of graduating from college affects the levels of social integration.	N	M
6. Initial commitment to the institution affects the level of social integration	W	W
7. Initial commitment to the institution affects the level of academic integration	W	W
8. The greater the level of academic integration, the greater the level of subsequent commitment to the goal of graduating from college.	M	M
9. The greater the level of social integration, the greater the level of subsequent commitment to the institution.	M	S
10. The initial level of institutional commitment affects the subsequent level of institutional commitment.	S	S
11. The initial level of commitment to the goal of graduating from college affects the subsequent level of commitment to the goal of college graduating.	S	S
12. The greater the level of subsequent commitment to the goal of college graduation, the greater the likelihood of student persistence in college.	S	W
13. The greater the level of subsequent commitment to the institution, the greater the likelihood of student persistence in college.	M	S
14. A high level of commitment to the goal of graduation from college compensates for a low level of commitment to the institution, and vice versa, in influencing student persistence in college.	M	S
15. A high level of academic integration compensates for a low level of social integration, and vice versa, in influencing student persistence in college.	NA	S/S*

* Compensatory test/ Stage's and Cabrera *et al.*'s test

Note: S= Strong support, M= Moderate support, W= Weak support, N= No support, Na= no test made. (Braxton *et al.*, 1997, p. 131)

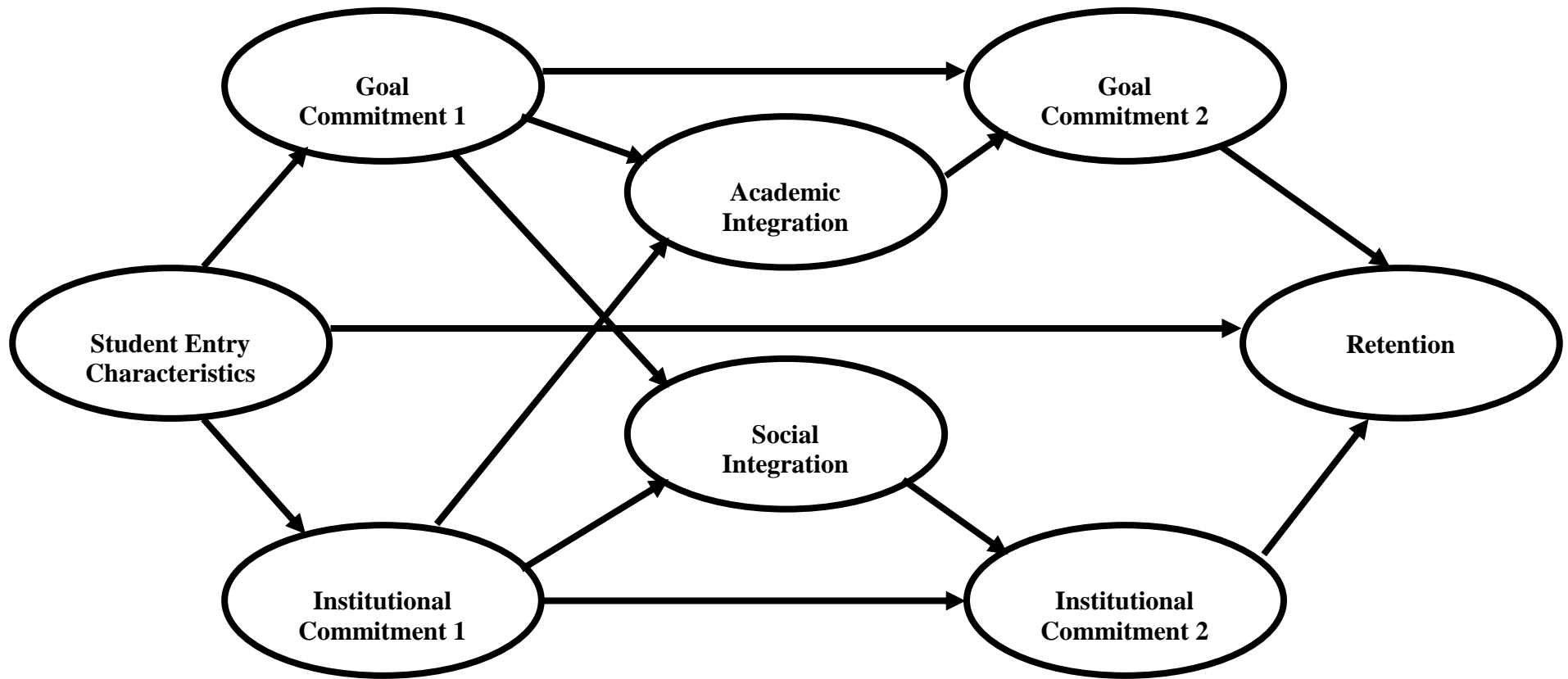


Figure 2.22 The Primary Propositions Derived from Tinto's Theory (Braxton *et al.*, 1997, p. 113)

Braxton *et al.* (1997) conducted a meta-analysis of peer reviewed studies that used Tinto's theory to determine which propositions were supported by empirical studies. They reviewed studies conducted either at a single institution, or at multiple institutions and generally used multivariate statistical approaches such as logistic regression, path analysis, or structural equation modelling because these approaches indicate the independent or net effects of each proposition beyond the effects of other constructs.

Braxton *et al.* (1997) classified the support of each proposition into one of the five categories: strong, moderate, weak, indeterminate, or no support. A proposition was considered to be strong if 66 percent or more of the three or more tests were statistically significant. If between 34 percent and 65 percent of three or more tests of a given proposition were statistically significant, then the proposition was assessed as being moderate. Weak support was assessed if 33 percent or less of three or more tests of a given proposition obtained statistical significance. A proposition was considered to have indeterminate support where only one test was made and the results were either statistically significant or non-significant. No support was assigned to a given proposition where two or more tests were statistically non-significant.

The empirical support for each proposition conducted at either a single institution or multiple institutions is summarized in Table 2.1. They found that two primary propositions were supported by both single-institutional

and multi-institutional tests. These are: (10) the initial level of institutional commitment affects the subsequent level of institutional commitment, and (11) the initial level of commitment to the goal of graduation from college affects the subsequent level of commitment to the goal of college graduation. In addition to these two propositions, two other propositions (2 and 12) were supported in multi-institutional tests, while five propositions (1, 9, 13, 14, and 15) were supported in single-institutional tests.

Braxton *et al.* also tested these propositions across different types of universities and colleges. The results of the support for each proposition by institutional type using multi-institutional tests or single-institutional tests are summarized in Table 2.2 and 2.3, respectively. They found that none of the 15 propositions were supported in multi-institutional tests. However, as can be seen from Table 2.2 multi-institutional tests were not conducted for most of these propositions. On the contrary, single-institutional tests were conducted in residential and commuter universities. They found that only one proposition (10) was supported by both residential and commuter universities. In addition to proposition 10, one proposition (1) was supported at commuter universities, while five propositions (5, 9, 11, 13, 14, and 14) were supported at residential universities.

Table 2.2 Magnitude of support for Each Proposition by Institutional Type: Multiple Institutional Tests

Proposition	Institutional Types				
	RU	CU	LA	CC	US
1	NA	NA	I	S	S
2	NA	NA	I	S	S
3	N	S	N	S	S
4	NA	NA	I	N	N
5	NA	NA	I	N	N
6	NA	NA	I	N	N
7	NA	NA	I	N	N
8	NA	NA	NA	M	S
9	I	I	I	M	S
10	NA	NA	I	N	M
11	NA	NA	I	NA	S
12	WS	NA	S	S	S
13	S	S	S	W	NA
14	I	I	I	I	NA
15	NA	NA	NA	NA	NA

Note: RU=Residential University, CU=Commuter University, LA=Liberal Arts College, CC=Two-year College, S=Strong support, M=Moderate support, W=Weak support, N=No support, I=Indeterminate support, NA=No test made. (Braxton *et al.*, 1997, p. 132).

Table 2.3 Magnitude of Support for Each Proposition by Institutional Type: Single Institutional Tests

Proposition	Institutional Types				
	RU	CU	LA	CC	US
1	M	S	NA	NA	NA
2	M	M	NA	NA	NA
3	W	W	NA	S	NA
4	W	M	NA	NA	NA
5	S	W	NA	NA	NA
6	M	N	NA	NA	NA
7	N	W	NA	NA	NA
8	M	M	NA	I	NA
9	S	M	NA	I	NA
10	S	S	NA	NA	NA
11	S	M	NA	I	NA
12	M	N	NA	I	NA
13	S	M	NA	I	NA
14	S	NA	NA	NA	NA
15	S/I*	NA/I**	NA	NA	NA

Note:*Compensatory test/Stage's test, **Cabrera et al.'s test. (Braxton *et al.*, 1997, p. 133).

The researchers also tested these propositions across student gender. They found that only one proposition (9) was supported by studies involving male students. No proposition was upheld by tests done with female students.

In 2005, Braxton and Lee used the primary propositions from Tinto's theory identified by Braxton *et al.* (1997) to determine which propositions were supported by "reliable knowledge". Reliable knowledge refers to the consistency in measurement of variables and results from replication studies. They selected a threshold of ten or more for each proposition as the standards for determining reliability. In addition, they required seven out of the ten tests (70%) to yield the same result in order to obtain reliable knowledge.

They selected studies that tested one or more of these propositions. They used only studies employing multivariate statistical procedures such as logistic regression, path analysis or structural equation modelling because these tools show the independent effects of each of the thirteen propositions. Because student retention processes may be different in different types of institution (Braxton, Hirschy, and McClendon, 2004), they reviewed those propositions in studies that were conducted in residential and commuter universities. Studies conducted on two-year colleges were not included because of "the indeterminate nature of empirical research testing Tinto's propositions in this institutional setting (Braxton and Lee, 2005, p. 111). They also selected studies that conducted at only single

institutions because Tinto's theory predicts student retention within a given university and 'is not a systems of model of departure' (Tinto, 1993, p.112).

They found that only three propositions (9, 10, and 13) were supported for residential universities. Proposition 9 was supported by sixteen tests out of nineteen. Of the eleven tests performed on proposition 10, nine were confirmed. Proposition 13 was confirmed by eleven out of thirteen tests. None of these thirteen propositions were supported for commuter universities, although propositions 10 and 13 for commuter universities were supported by five and six tests respectively. However, they did not reach the threshold of ten tests to ascertain reliability.

To summarize, Tinto's model has been useful in explaining student retention in both residential and commuter institutions. However, more of Tinto's propositions are better supported in residential institutions than in commuter institutions.

In both institutional types, Tinto's model explains less than 50 percent of the variation in student retention. This means that more than half of proportion of the variance in retention is still unexplained. This indicates that at least some important predictors of student retention may not be specified by the Tinto model.

A number of points can be made in relation to methodology. First, most of the studies tested the model in the first year and collected the data at

several points during that year. Second, most of the studies used Pascarella and Terenzini (1980) scales to measure Tinto's constructs.

Third, the best statistical methods to test the model are path analysis and structural equation modelling because these methods can estimate and test the relationships among the constructs within Tinto model and also allow for the use of multiple measures to represent constructs. However, structural equation modelling is more useful than path analysis because it takes measurement and specification errors into account whereas path analysis assumes no measurement or specification error. Ignoring measurement error may lead to systemic bias in parameter estimates.

2.4 Studies in Saudi Arabia

There were no studies found in the literature testing the validity of Tinto's model in predicting student retention in Saudi Arabian higher education. However, some studies have examined the validity of high school and aptitude tests in predicting student academic performance and retention.

A Ph.D. dissertation study conducted by Al-Raegi (1981) examined the predictive validity of high school test in predicting academic success as measured by freshman GPA for science majors in colleges of education in Saudi Arabia. Using simple correlation, the result indicated that high school total score had a moderate significant correlation (0.49) with freshman GPA.

Another Ph.D. dissertation study conducted by Aldoghan (1985) examined the predictive validity of the high school test and an admission test used at

King Fahd University of Petroleum and Minerals in predicting students' academic success. Academic success was measured by four variables: preparatory GPA, freshman GPA, final GPA, and attrition status. Data were collected from 1,261 male students from the university admission office.

Using multiple correlation and multiple regressions, the results indicated that high school test score and admission test score had modest and almost equal correlations with academic success variables. High school test had correlations of 0.53, 0.52, 0.43, and -0.36 with Preparatory GPA, freshman GPA, Final GPA and attrition status, respectively. The admission test had correlations of 0.58, 0.55, 0.42, and -0.34 with Preparatory GPA, freshman GPA, Final GPA and attrition status, respectively. However, the high school test was found to be a better predictor of final GPA and retention, while the admission test was a better predictor of preparatory GPA and freshman GPA. The high school test predicted 18 and 13 percent of the variance in final GPA and attrition status, respectively. Adding the admission test increased the prediction power slightly, providing 0.05 and 0.3 percent of variance, respectively.

Two studies examined student retention at King Fahd University of Petroleum and Minerals. One study conducted by Aldosary and Assaf (1996) to examine the factors influencing the selection of majors. Data were collected from 412 new orientation students using a questionnaire.

The results revealed that the most important factors were job availability, prospective salary, social status and prestige of the major.

Another study conducted by Aldosary and Garba (1999) examined students' perceptions of the reasons for high attrition rate. Data were collected from 600 students using a 95-item structured questionnaire.

Descriptive statistics (mean and standard deviation) were used to analysis the data. The results indicated that the students appeared generally motivated and committed to the institution. Most students were uncertain if being away from home and peer pressures affected their study. In terms of the social environment of the university, students appeared to be dissatisfied with some of the available social facilities such as accommodation and food services. In addition, students were dissatisfied with their relationships with faculty and not certain if instructors were fair in awarding grades. The major reasons contributing to students' decision to persist or dropout were academic performance and the appeal of courses and course instructors.

2.5 Conclusion

This chapter has presented a review of the literature on student retention in higher education. It was divided into three sections. The first reviewed the leading theories of student retention. Researchers, particularly in the US, have studied student retention from five theoretical perspectives: psychological, societal, economic, organizational, and interactional. The

most widely discussed and most researched model of student retention is Tinto's model.

The second section reviewed research empirically testing Tinto's model. These studies were grouped into three sub-sections: research conducted in residential institutions, research conducted in commuter institutions, and research conducted across different types of institutions.

The final section presented studies conducted in Saudi Arabia, the focus of this thesis, related to predicting student academic success and retention.

The next chapter will present a detailed description of the research design and methodology utilised in this thesis.

Chapter 3 - Research Design and Methodology

3.1 Introduction

This chapter presents a detailed description of the research design and methodology adapted for this thesis. The purpose of this study is to identify the factors affecting student retention at King Saud University. The chapter is organized in eight sections: (a) aim and objectives, (b) research paradigm, (c) research methodology, (d) research design, (e) the setting of the study, (f) the theoretical framework, (g) the quantitative approach, and (h) the qualitative approach.

3.2 Aim and objectives

The general aim of this study was to identify why students drop out from King Saud University without completing the programme of studies which they enrolled upon.

The objectives of the study were:

- To identify factors affecting the retention of Saudi Arabian students at King Saud University using Tinto's (1975) Student Integration Theory.
- To examine the role and the validity of the General Reasoning test in predicting student success as measured by retention.

3.3 Research paradigm

Before selecting an appropriate methodology for research, a suitable paradigm needs to be selected because the paradigm affects every stage of the research from deciding on the research problems to the analysing and interpreting the data (Deshpande, 1983; Easterby-Smith *et al.*, 1991; Denzin and Lincoln, 2000; Mertens, 2005). The paradigm can be defined as a 'basic set of beliefs or assumptions that guide' research (Creswell, 1998, p.74).

There are many different paradigms in the social sciences and they differ in terms of their underlying philosophical assumptions. Thus, in order to determine the suitable paradigm, it is necessary to understand the assumptions for each paradigm. The basic philosophical assumptions are ontology, epistemology and methodology (Denzin and Lincoln, 1998; Guba and Lincoln, 2000; Neuman, 2003; Creswell and Plano Clark, 2007). Ontology refers to the nature of reality and what can be known about it. Epistemology refers to the nature of the relationship between the knower and what can be known. Methodology refers to the techniques or research methods that are used to obtain knowledge (Guba and Lincoln, 2000). Three major paradigms are discussed, namely positivism, constructivism and pragmatism (Creswell and Plano Clark, 2007).

3.3.1 Positivist paradigm

Positivism is the oldest paradigm in the social sciences. It is linked to the work of Comte and Durkheim (Sarantakos, 1998). It is sometimes referred

to as the 'scientific method'. Positivists believe that universal laws and truths drive one reality. They are assumed to be objective and independent. They use experimental and quantitative methods to test and verify hypotheses (Guba and Lincoln, 2000). Since the study within this dissertation deals with variables within the context of complex real life social experiences, the use of this paradigm alone is insufficient.

3.3.2 Constructivist paradigm

Constructivists believe that there are multiple, constructed realities with any context. Further they believe that the researcher is not independent from the subject of the study, but interacts with the respondents to construct the outcome (Guba and Lincoln, 2000). Constructivists use qualitative and naturalistic methods to inductively and holistically understand human experience in context-specific settings. However, since this study considers some measurable and objective concepts, this paradigm alone is also not suitable for the study.

3.3.3 Pragmatist paradigm

There have been many attempts in the social sciences to create a middle ground between the positivism and constructivism positions. Howe (1988) posits the use of a different paradigm named 'pragmatism' to counter the link between epistemology and method. He states that the concept of pragmatism assumes that quantitative and qualitative methods are compatible. Pragmatist researchers consider the research question to be more important than either the methodology approach or the paradigmatic assumptions that underly the research method (Tashakkori and Teddlie,

1998). They believe that both quantitative and qualitative methods are useful. According to Tashakkori and Teddlie (1998, p. 24), 'decisions regarding the use of either qualitative or quantitative methods (or both) depend upon the research question'. Pragmatists may be both objective and subjective in epistemological position. 'At some points the knower and known must be interactive, while at others, one may more easily stand apart from what one is studying' (Tashakkori and Teddlie, 1998, p. 26). Pragmatists agree with positivists that there is an external reality but they deny that there is an absolute truth (Tashakkori and Teddlie, 1998; Creswell, 2003). Thus, this study is seen to lie within this paradigm because both quantitative and qualitative methods are used.

3.4 Research methodology

A research methodology is 'a model which entails theoretical principles as well as a framework that provides guidelines about how research is done in the context of a particular paradigm' (Sarantakos, 1998, p. 32). There are three approaches that inform the gathering of data in any research, namely the quantitative approach, the qualitative approach, and mixed methods approach (Tashakkori and Teddlie, 1998; Creswell and Plano Clark, 2007).

3.4.1 Quantitative approach

A quantitative approach is defined as 'an inquiry into a social or human problem, based on testing a theory composed of variables, measured with numbers, and analysed with statistical procedures, in order to determine

whether the predictive generalizations of the theory hold true' (Creswell, 1994, p.2). Its main aims are to objectively measure the social world, to test hypotheses and to predict and control human behaviour. Creswell (2002) points out that a quantitative approach is useful when attempting to test a theory or explain or identify factors that influence results. It is concerned with questions about How much? How many? How often? To what extent? (Yin, 2003). The most common quantitative approach methods include experiments, quasi-experiments and surveys.

The strengths of a quantitative approach are that it can produce factual, reliable outcome data that is usually generalizable to some larger population (Denzin and Lincoln, 2000; Patton, 2002). Its main limitation is that the results provide less detail on human behaviour, attitudes and motivation (Gorard, 2003).

3.4.2 Qualitative approach

A qualitative approach can be defined as 'an inquiry process of understanding a social or human problem, based on building a complex, holistic picture, formed with words, reporting detailed views of informants, and conducted in a natural setting' (Creswell, 1994, pp. 1-2). Its main aim is to understand life and the meaning that people attach to it (Lincoln and Guba, 1985). It is appropriate when variables are unknown and the theory base is 'inadequate, incomplete, or simply missing' due to a lack of previous research (Creswell, 1994, p. 10). Qualitative research is concerned with finding the answers to questions which begin with: Why?

How? In what way? (Yin, 2003). Qualitative methods include individual interviews, focus groups, direct observation, action research, and case studies (Hancock, 1998).

The strengths of a qualitative approach are that it gives richness and a deeper insight into the phenomena under study. It also tends to be more flexible since the researcher can change questions as the data collection progresses, and has the ability to attract more readers because of its less formal and statistically focused approach (Hancock, 1998). Its limitations include that the results of a study may not be generalisable to a larger population because the sample size was small and the participants were not chosen randomly. Data collection can be time-consuming and analysing it tends to be difficult (Fellows and Liu, 1997).

3.4.3 Mixed methods approach

A mixed-methods approach is research wherein qualitative and quantitative approaches are combined. According to Creswell (2003), the idea of mixing different methods probably originated in 1959 when Campbell and Fiske used multiple methods to study the validity of psychological traits. A number of terms are used for this approach such as convergent methodology, multi-method/multi-trait, convergent validation, triangulation, integration, synthesis and quantitative and qualitative methods. Lately, however, researchers use the term mixed methods (Creswell, 2003; Creswell and Plano Clark, 2007).

Because of the many terms used for this approach and the many variations of mixed methods studies, there is some debate amongst researchers as to what would be a precise definition of this approach (Greene *et al.*, 1989; Creswell *et al.*, 2003). Some researchers focus on the philosophical assumptions (e.g., Tashakkori and Teddlie, 1998). Others focus on the techniques or methods of collecting and analyzing data (e.g., Greene, *et al.*, 1989; Creswell, *et al.*, 2003; Onwuegbuzie and Teddlie, 2003; Johnson and Onwuegbuzie, 2004). However, Creswell *et al.* (2007) have given a broad definition focusing on the philosophical assumptions and the methods. They define this approach as

‘a research design with philosophical assumptions as well as methods of inquiry. As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis of data and the mixture of qualitative and quantitative approaches in many phases in the research process. As a method, it focuses on collecting, analyzing, and mixing both quantitative and qualitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach alone.’ (Creswell and Plano Clark, 2007, p.5)

The goal of the mixed methods approach is to draw from the strengths and to minimise the weaknesses of both qualitative and quantitative approach (Johnson and Onwuegbuzie, 2004). There are five major purposes or rationales for conducting the mixed methods approach: (1) triangulation (i.e., seeking convergence and corroboration of results from different methods and designs studying the same phenomenon); (2) complementarity (i.e., seeking elaboration, enhancement, illustration, and

clarification of the results from one method with results from the other method); (3) initiation (i.e., discovering paradoxes and contradictions that lead to a re-framing of the research question); (4) development (i.e., using the findings from one method to help inform the other method), and, (5) expansion (i.e., seeking to expand the breadth and range of research by using different methods for different inquiry components) (Greene *et al.*, 1989). For this study, the main purpose for conducting this approach is triangulation, thus, to seek convergence, corroboration and correspondence of results from different methods, by studying the same phenomena.

The advantage of the mixed methods approach is that both approaches (quantitative and qualitative) have strengths and weaknesses, and that the weakness of one can be remedied or compensated for by the strengths of the other (Creswell and Plano Clark, 2007). Another advantage is that the mixed-methods approach can answer a broader and more complete range of research questions (Johnson and Onwuegbuzie, 2004). Furthermore, applying the mixed methods approach can improve insights into and understanding of the data, which might be missed when using a single approach. Lastly, mixed methods can be applied to increase the generalisability of the results of a study (Johnson and Christensen, 2004). However, conducting the mixed methods approach takes time and resources to collect and analyse both quantitative and qualitative data. It also requires that the researchers are familiar with the collection and

analysing both quantitative and qualitative data (Creswell and Plano Clark, 2007).

There are different strategies for combining quantitative and qualitative methods. Creswell (2003) describes six strategies for mixing qualitative and quantitative methods depending on 1) the implementation sequence, 2) priority, 3) the integration stage of quantitative and qualitative data collection and analysis and 4) the role of theoretical perspective in the study. These six strategies are:

- 1. A sequential explanatory strategy:** In this strategy quantitative data collection and analysis is conducted first, followed by qualitative data collection and analysis. Priority is given to quantitative data and the methods are integrated during the interpretation stage of the study. This strategy may or may not have a specific theoretical perspective.
- 2. A sequential exploratory strategy:** In this strategy qualitative data collection and analysis is conducted first, followed by quantitative data collection and analysis. Priority is given to qualitative data and the methods are integrated during the interpretation stage of the study. This strategy may or may not also have a specific theoretical perspective.
- 3. A sequential transformative strategy:** This strategy has two data collection phases, however, either method may be used first and the priority may be given to either qualitative or quantitative

methods or both. The two methods are integrated during the interpretation stage. This strategy has a theoretical perspective to guide the study.

4. **A concurrent triangulation strategy:** In this strategy both types of data are collected and analysed at the same time. Priority is equal between the methods and the integration occurs during the interpretation stage of the study.
5. **A concurrent nested strategy:** In this strategy both types of data are collected and analysed at the same time. One of the methods has a priority and the integration is done in the data analysis stage. This strategy may or may not also have a specific theoretical perspective.
6. **A concurrent transformative strategy:** In this strategy the two types of data are collected at the same time and may have equal or unequal priority. The integration is usually done during the data analysis stage, but it can also take place in the interpretation stage. The strategy is guided by the researcher's use of a specific theoretical perspective.

3.5 Research design

The mixed methods approach was used in this study. The use of this approach can be justified for a number of reasons. First, integrating qualitative and quantitative approaches can overcome the weaknesses and utilise the strengths of each approach. Second, integrating qualitative

and quantitative data can provide strong evidence for conclusions. Third, triangulating the data from different methods increases the validity of the results and the conclusions. Finally, the strengths of one method can be used to compensate the deficits of another method.

Using the terminology of Creswell (2003), the appropriate description of the overall design of this study is a mixed methods concurrent triangulation strategy. This means that 'quantitative and qualitative data are collected and analysed at the same time. Priority is usually equal and given to both forms of data. Data analysis is usually separate, and integration usually occurs at the data interpretation stage' (Hanson *et al.*, 2005, p. 229). This strategy is the best known to researchers and also can result in well-validated and substantiated findings (Creswell, 2003). Morse's (2003) notation system for mixed methods strategies would describe the design as "QUAN + QUAL" strategy. The plus signifies that the two approaches are used concurrently, and the capitalization means that the priority is equal between the two approaches.

This strategy was selected for several reasons. First, it allows the findings to be confirmed, cross-validated, and corroborated within a single study. Second, this strategy resulted in a shorter data collection time compared to other mixed methods strategies, e.g. the sequential strategies (Creswell and Plano Clark, 2007). Third, because the target population of this study lived in another country, Saudi Arabia, it made sense to use this strategy in order to save travelling time and cost.

The concurrent triangulation strategy is explained visually in Figure 3.1 as recommended by Creswell and Plano Clark (2007). In this study, quantitative data were collected from 414 students at three times during the academic year 2005-2006 using two questionnaires administered at two occasions and from the university admission office. At the same time, qualitative data were collected. It included phone interviews with 17 withdrawn students, focus groups with 15 current students, and a survey of 37 staff members at King Saud University.

3.6 The setting

This study was conducted at King Saud University (KSU), a public and large university located in Riyadh, the capital city of Saudi Arabia. KSU was established in 1957 as Riyadh University and was renamed in honour of King Saud in 1982. It is one of fourteen universities, all of which are controlled by the Ministry of Higher Education. KSU has twenty colleges and institutes¹.

KSU was selected as a case study because it has a large number of student enrolments. In the academic year 2004-2005, there were 48,720 students enrolled at undergraduate level, of which 19,911 were female students. The number of students enrolled in the same year in graduate studies at the university was 3,965 of whom 1,066 students were female.

¹ These are: the Colleges of Arts, Sciences, Administrative Sciences, Pharmacy, Engineering, Foods and Agriculture, Education, Medicine, Dentistry, Applied Medical Sciences, Computer Sciences, Planning and Architecture, Languages and Translation, Nursing, and Applied Studies and Community Service. Additionally, KSU includes the Institute of Arabic for Non-native speakers and four community colleges spreading in four cities: AIRiyadh, AIQrayat, Alafraj, and AIMajmaah.

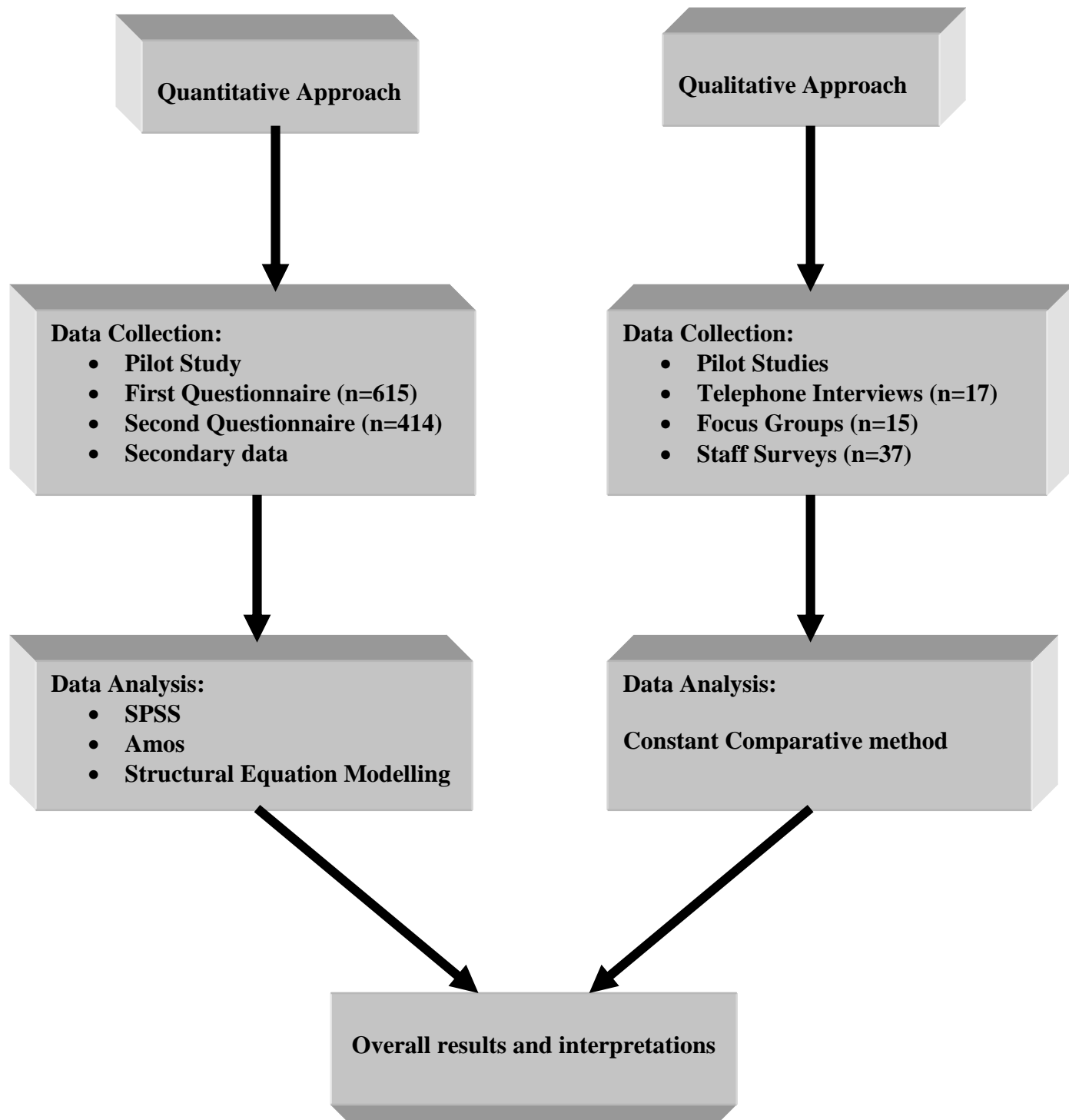


Figure 3.1 Visual Diagram of the Concurrent Triangulation Strategy used in this study

The number of freshmen students was 14,595 (King Saud University, 2005).

Permission to conduct the study was gained from KSU with the assistance from the Ministry of Higher Education in Saudi Arabia. It was received on August 27, 2005. A copy of the permission from KSU is provided in Appendix A.

3.7 Quantitative approach

3.7.1 The model and hypotheses

The purpose of this study is to identify the factors affecting student retention at King Saud University. This study was guided by Tinto's (1975) model of student integration. As indicated in chapter two, Tinto modified his model in 1993. In this study Tinto's original model was used rather than the modified one for two reasons. First, Tinto's original model was developed especially to explain student retention at four-year residential institutions while the modified model was developed to include other types of institutions such as four-year and two-year commuter institutions. This study is conducted at King Saud University which is four-year residential institution. The second reason for using Tinto's original model is that his modified model considers the importance of finance in student retention. As higher education in Saudi Arabia is free and also university students receive monthly bursaries from the government, it is thought that financial issue will not be an important reason for students to leave university.

The model used in this study is presented visually in Figure 3.2. According to the model, family background, individual attributes, and pre-college schooling affect initial goal and institutional commitment. Initial goal and institutional commitment then affects academic and social integration. These two types of integration, along with initial goal and institutional commitment, have direct effects on later goal and institutional commitment. Later goal and institutional commitment subsequently have a direct effect on the decision of the student to persist or to drop out.

Based on Tinto's (1975) model of student integration, the following hypotheses were formulated:

Hypothesis 1: students' family background will be positively related to their initial goal and institutional commitments.

Hypothesis 2: students' pre-college schooling will be positively related to their initial goal and institutional commitments.

Hypothesis 3: students' attitude will be positively related to their initial goal and institutional commitments.

Hypothesis 4: students' initial goal and institutional commitments will be positively related to their later goal and institutional commitments.

Hypothesis 5: students' initial goal and institutional commitments will be positively related to their academic integration.

Hypothesis 6: students' initial goal and institutional commitments will be positively related to their social integration.

Hypothesis 7: students' academic integration will be positively related to their subsequent goal and institutional commitments.

Hypothesis 8: students' social integration will be positively related to their subsequent goal and institutional commitments.

Hypothesis 9: students' subsequent goal and institutional commitments will be positively related to their retention status.

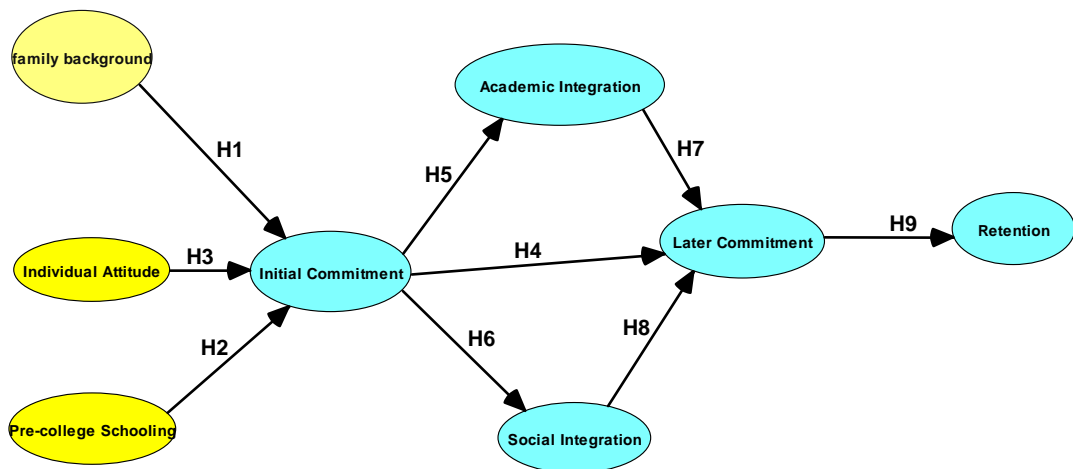


Figure 3.2 Initial Model of Student Retention

3.7.2 Data collection methods and participants

The criteria to select the participants were that there were first time freshmen in the 2005-2006 academic year, male and Saudi students. Freshman students were selected because research has shown that most students drop out during their freshman year (Astin, 1993; Tinto, 1993; 1996; Johnson, 1994; Yorke, 1999; Blythman and Orr, 2003; Fitzgibbon and Prior, 2003; Pascarella and Terenzini, 2005). Female students were excluded because the particular cultural conditions of Saudi Arabia create difficulties in getting access. The number of non-Saudi, freshmen in the 2005-2006 academic year was 243 students. Since the number of non-Saudi students at KSU was small, they were also excluded from the study. Students studying at medical colleges were also excluded because the attrition rates are very low. The total number of freshmen meeting these criteria was 7,035.

Two questionnaires were developed to measure the variables. The first questionnaire was designed to collect information about students' parents' formal education and to assess their initial goal and institutional commitment. The second questionnaire was designed to assess students' social and academic integration and their later goal and institutional commitment.

Institutional integration scales developed by Pascarella and Terenzini (1980) were used to measure the four constructs in this study. These constructs were initial goal and institutional commitment, social integration,

academic integration, and later goal and institutional commitment. The scales use a five-point Likert scale, ranging from strongly disagree, with a value of one, to strongly agree, with a value of five. It initially consisted of 34 items. However, the number of items was reduced to 30 after Pascarella and Terenzini (1980) found that four of the items failed to load 0.35 or above on any of the five factors extracted based on the results of an exploratory principal components analysis with orthogonal (i.e., varimax) rotation. Pascarella and Terenzini (1980) labelled the five scales as follows: (1) Peer-Group Interactions (7 items), (2) Interactions with Faculty (5 items), (3) Faculty Concern for Student Development and Teaching (5 items), (4) Academic and Intellectual Development (7 items), and (5) Institutional and Goal Commitment (6 items). The scales' items are shown in Table 3.1.

The scales were used in this study for two main reasons. First, Pascarella and Terenzini developed these scales particularly to measure constructs of the Tinto model. Second, their reliability and validity have been well tested. Pascarella and Terenzini (1980) found that the internal consistency reliability of the scales were adequate, with coefficient alpha reliabilities on scales ranging from 0.71 to 0.84. A number of subsequent studies (Terenzini *et al.*, 1981; Pascarella and Terenzini, 1983; Bers and Smith, 1991; Mallette and Cabrera, 1991) have also found that the internal consistency reliability of the scales is adequate, with average coefficient alpha reliability values above 0.7. Pascarella and Terenzini (1980) have examined the validity of the scales and found that a five factor solution

Table 3.1 Institutional Integration Scales' Items (Pascarella and Terenzini, 1980, pp 66-67)

<i>Scales</i>	<i>Items</i>
Peer Group Interactions	<p>1. Since coming to this university, I have developed close personal relationships with other students.</p> <p>6. The student friendships that I have developed at this university have been personally satisfying.</p> <p>11. My interpersonal relationships with other students have had a positive influence on my personal growth, attitudes and values.</p> <p>16. My interpersonal relationships with other students have had a positive influence on my intellectual growth and interest in ideas.</p> <p>21. <i>It has been difficult for me to meet and make friends with other students.</i></p> <p>26. <i>Few of the students I know would be willing to listen to me and help me if I had a personal problem.</i></p> <p>29. <i>Most students at this University have values and attitudes different to my own.</i></p>
Interactions with Faculty	<p>2. My non-classroom interactions with faculty have had a positive influence on my personal growth, values and attitudes.</p> <p>7. My non-classroom interactions with faculty have had a positive influence on my intellectual growth and interest in ideas.</p> <p>12. My non-classroom interactions with faculty have had a positive influence on my career goals and aspirations.</p> <p>17. Since coming to this university, I have developed a close, personal relationship with at least one faculty member.</p> <p>22. I am satisfied with the opportunities to meet and interact informally with faculty members.</p>
Faculty Concern for Student Development & Teaching	<p>3. <i>Few of the faculty members I have had contact with are generally interested in students.</i></p> <p>8. <i>Few of the faculty members I have had contact with are generally outstanding or superior teachers.</i></p> <p>13. <i>Few of the faculty members I have had contact with are willing to spend time out of class to discuss issues of interest and importance to students.</i></p> <p>18. Most of the faculty I have had contact with are interested in helping students grow in more than just academic areas.</p> <p>23. Most of the faculty I have had contact with are genuinely interested in teaching.</p>
Academic Intellectual Development	<p>4. I am satisfied with the extent of my intellectual development since enrolling in this University.</p> <p>9. My academic experience has had a positive influence on my intellectual growth and interest in ideas.</p> <p>14. I am satisfied with my academic experience at this University.</p> <p>19. <i>Few of my courses this year have been intellectually stimulating.</i></p> <p>24. My interest in ideas and intellectual matters has increased since coming to this University.</p> <p>27. I am more likely to attend a cultural event (for example, a concert, lecture or art show) now than I was before coming to this University.</p> <p>30. I have performed academically as well as I anticipate I would.</p>
Institutional & Goal Commitment	<p>5. It is important for me to graduate from college.</p> <p>10. I am confident that I made the right decision in choosing to attend this University.</p> <p>15. It is likely that I will re-enrol at this University next fall.</p> <p>20. <i>It is not important to me to graduate from this University.</i></p> <p>25. <i>I have no idea at all what I want to major in.</i></p> <p>28. <i>Getting good grades is not important to me.</i></p>

Note: Italicised items indicate items that are negatively scored.

accounted for 44.45% of the variance. A number of additional studies (e.g. Terenzini, *et al.*, 1981; Bers and Smith, 1991) have supported Pascarella and Terenzini's (1980) results.

Before the start of the main study, a pilot study was carried out. The main purpose of the pilot study was to check the clarity of the questions, to eliminate difficulties or ambiguities in wording, and to estimate the length of time a participant would take to complete the questionnaires (Cohen *et al.*, 2000).

The pilot study was conducted in late September 2005 for a group of freshmen students (n=17) who were admitted in the 2005-2006 academic year. Because the Institutional Integration Scales were used in the questionnaires and the items in the scales are written in English, the scales were translated to the Arabic language at a translation office in Saudi Arabia. To ensure the accuracy of the translation, Arabic and English versions of the scales were checked by a member of the Language and Translation College at King Saud University.

The two questionnaires took approximately 10 minutes to be completed. Some revisions were made to the scales to take account of the Saudi higher education context. One item "I have no idea what I want to major in" was deleted because it did not apply to the Saudi higher education context, as all students select their majors from the first year. The words 'this university' were replaced with 'King Saud University' on a number of

items. Copies of the two questionnaires are included in Appendix B in English as well as in Arabic.

After conducting the pilot study, the main study was conducted. Data of the main study were collected at three times during the 2005-2006 and the 2006-2007 academic years from the two questionnaires and the university admission office. The first questionnaire was administered in October 2005. This questionnaire consisted of five items from Institutional Integration Scales (Pascarella and Terenzini, 1980) measuring students' initial goal and institutional commitment and two items measuring students' parental formal education. The second questionnaire was administered to the same students in December 2005. The second questionnaire consisted of 29 items from the Institutional Integration Scales measuring students' later goal and institutional commitment, academic integration, and social integration. The third data set was collected in October 2006 from the university admission office. These data consisted of students' results in high school tests and reasoning tests and their retention status.

In order to achieve high response rates, the two questionnaires were administered to students in their classes. The questionnaires were administered by the researcher with help from KSU staff. Each member of staff was approached individually to request time in their classes for the administration of the questionnaires. At the time of administration, students were asked for written consent to use information from their

university records for the purpose of this study (Appendix F). The number of students in each class was between 40 to 60 students and the researcher attended 17 classes twice.

The first questionnaire was completed by 665 students. The second questionnaire was administered to the same students. However, early attrition and class absences reduced the number to 417 students. A review of each student's records indicated that 52 of the 417 students had withdrawn voluntarily from the university at the end of their freshman year, while 362 had re-enrolled for their second year. The remaining three students had been required to withdraw for academic reasons. These students were excluded from the analysis because research suggested that voluntary withdrawals are significantly different from forced withdrawals (Cope and Hannah, 1975; Tinto, 1993). The final participants for the study consisted therefore of 414 students.

3.7.3 Constructs and their measures

There are eight constructs in the model (Figure 3.2). These are family background, pre-college schooling, individual attribute, initial goal and institutional commitment, social integration, academic integration, later goal and institutional commitment, and retention. These constructs were measured as follows:

Family Background. This construct was measured by two items asking the students about their mothers' and fathers' formal education. It ranged from

1 = primary school graduate or less to 5 = master's degree or above. This construct was obtained from the first questionnaire.

Pre-college Schooling. This construct was measured by student high school scores. It was taken from the university admission office.

Individual attribute. This construct was measured by general reasoning test scores. It was also taken from the university admission office.

Initial goal and institutional commitment. This construct was measured with institutional/goal commitment scale developed by Pascarella and Terenzini (1980). This scale comprised of five items and it was taken from the first questionnaire.

Social integration. According to Tinto's model, social integration is primarily a function of the extent and quality of peer-group interaction and the extent and quality of student interactions with faculty (Pascarella and Terenzini, 1980). Thus, this construct was measured with two scales developed by Pascarella and Terenzini (1980): Peer-Group Interactions and Interactions with Faculty. The Peer-Group Interactions scale had seven items and the Interactions with Faculty scale had five items. It was obtained from the second questionnaire.

Academic integration. According to Tinto's model, academic integration is determined primarily by the student's academic performance and his level of intellectual development. However, Cabrera, Nora, and Castaneda (1992) found that students' academic performance as measured by GPA

loaded poorly as a measure of academic integration. Thus, this construct was measured with two scales developed by Pascarella and Terenzini (1980): Faculty Concern for Student Development and Teaching, and Academic and Intellectual Development. The Faculty Concern for Student Development and Teaching scale had five items and the Academic and Intellectual Development scale had seven items. This construct was taken from the second questionnaire.

Later goal and institutional commitment. This construct was measured with institutional/goal commitment scale developed by Pascarella and Terenzini (1980) and it was obtained from the second questionnaire.

Retention. This construct was defined as whether or not students returned for the second year. It was obtained from the university admission office in October 2006 and was coded: 1 = persisters and 0 = voluntary dropouts.

3.7.4 Data analysis

The data were analysed using Structural Equation Modelling (SEM). SEM is a technique which uses various types of models to depict relationships among observed variables with the goal of testing a theoretical model hypothesized by a researcher. This allows various theoretical models to be tested in SEM to understand how sets of variables define constructs and how these constructs are related to each other (Schumacker and Lomax, 2004). The early development of SEM are derived from the work of Karl Jöreskog and his associates and regarded as one of the most important and influential statistical revolutions (Cliff, 1983).

SEM was adopted in this study for four reasons. First, SEM is able to estimate and test the relationships among constructs. Second, SEM is capable of assessing and correcting for measurement error. Ignoring measurement error could lead to bias in estimating parameters (Stage, 1988). Third, SEM allows for the use of multiple measures to represent constructs. Fourth, SEM takes a confirmatory, rather than an exploratory, approach to the data analysis (Byrne, 2001; Schumacker and Lomax, 2004). Analyses were run using the Analysis of Moment Structures (AMOS 5) (Arbuckle, 2003a; 2003b) software program.

In preparation of data for the analysis, the negatively worded items from the Institutional Integration Scales were reverse scored so all item responses reflected positive student integration. In addition, data were checked and screened for missing values, outliers, and normality distributions according to the guidelines provided by Tabachnick and Fidell (2001), and Hair, Anderson, Tatham and Black (1998) through version 14.0 of the SPSS.

In SEM, there are two main types of variables: *latent variables* and *observed variables*. Latent variables are variables that cannot be measured or observed directly but inferred from measured variables. They are also known as factors, constructs or unobserved variables. Examples of latent variables in this study are academic integration, social integration, and commitment. Observed variables are a set of variables that are used to define or infer the latent variables. They are also known as measured

variables, indicators or manifest variables. Examples of observed variables in this study are the items of Pascarella's questionnaire measuring three latent variables (academic integration, social integration, and commitment).

In addition, latent variables can be classified as either *exogenous variables* or *endogenous variables*. An exogenous variable is a variable that is not influenced by any other variable in the model. An endogenous variable is a variable that is influenced by another variable in the model. In this study, there are three exogenous variables (family background, individual attributes, and pre-college schooling) and five endogenous variables (initial commitment, later commitment, social integration, academic integration, and retention behaviour).

As recommended by Jöreskog (1993), Castaneda (1993), and Anderson and Gerbing (1988), a two-step structural equation modelling procedure was employed in estimating parameters: a measurement model followed by a structural model. The measurement model, which is a confirmatory factor analysis, specified the relationships between observed variables and latent variables. It provided an assessment of reliability and validity of observed variables for each latent variable. The structural model specified the relationships among latent variables (Schumacker and Lomax, 2004).

Most structural equation models can be developed in five steps (Bollen and Long, 1993). These steps are: (a) model specification, (b) model

identification (c) model estimation, (d) testing model fit, (e) model modification.

SEM begins with the specification of a model to be estimated. A model is a statistical statement about the relations among variables. Models are specified based on a theory or prior research. Model specification is probably the most important and difficult steps because a misspecified model may result in biased parameter estimates (Cooley, 1978; Byrne, 2001). In this study, the model is based on Tinto's theory and shown in figure 3.2.

There are two types of relationships among variables: directional and non-directional. Directional relationships represent hypothesized linear directional influences of one variable on another. Non-directional relationships represent hypothesized correlational associations between variables (MacCallum, 1995). Each of these directional and non-directional associations can be thought of as having a numerical value associated with it. The numerical values associated with directional effects are values of regression coefficients. Numerical values associated with non-directional relationships are covariance or correlation values. These regression coefficients and covariances are called model parameters. A major objective in SEM is to estimate the parameters' values.

It is very common and useful in practice to specify models using path diagrams. It is standard convention to use squares or rectangles to represent observed variables and circles or ovals to represent latent

variables, including error terms. Directional effects between variables are specified using single-headed arrows, and non-directional relationships are represented using double-headed arrows. Figure 3.3 shows the most commonly used symbols in SEM.

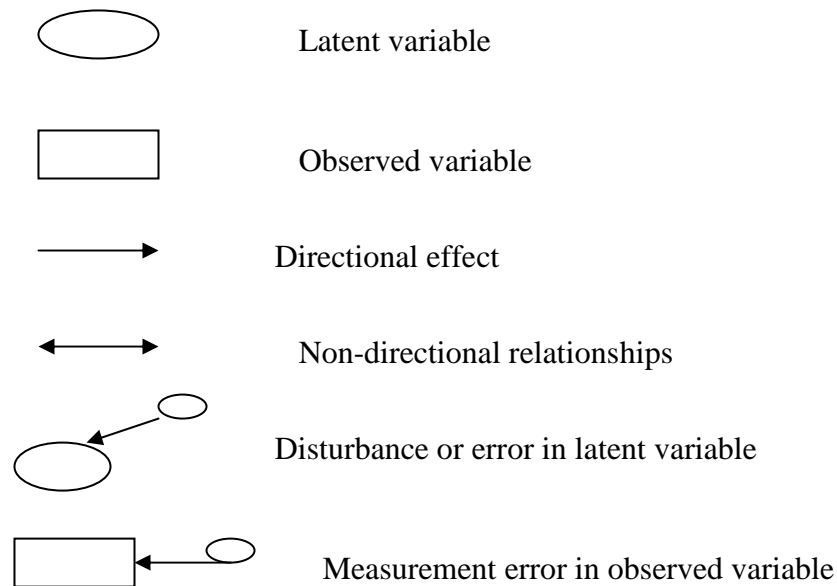


Figure 3.3 Common Path Diagram Symbols

Model Identification focuses on whether or not there is a unique set of parameters consistent with the sample data. In model identification, each parameter in a model must be specified to be either a free parameter, a fixed parameter, or a constrained parameter. A free parameter is a parameter that is unknown and needs to be estimated. A fixed parameter is a parameter that is not free but is fixed to a specified value, typically either 0 or 1. A constrained parameter is a parameter that is unknown but is constrained to equal one or more other parameters.

Schumacker and Lomax (2004) indicate three different identification types.

If all the parameters are uniquely determined with just enough information,

then the model is a just-identified one and has zero degrees of freedom. If there is more than enough information therefore there is more than one way of estimating a parameter and then the model is over-identified. If one or more parameters may not be uniquely determined because of a lack of information, then the model is under-identified.

If a model is either just- or over-identified, then it is identified. However a just-identified model is not scientifically interesting because it has no degrees of freedom and therefore can never be rejected (Byrne, 2001). The model needs to be over-identified in order to be estimated (Ullman, 2001). If a model is under-identified, then it is not identified. However, an under-identified model may become identified if additional constraints are imposed (Schumacker and Lomax, 2004).

One condition for establishing model identification in the Amos program is the order condition (Byrne, 2001). It requires that the number of free parameters to be estimated must be less than or equal to the number of data points (regression coefficients, covariances, and variances). The number of data points is equal to $p(p+1)/2$, where p is the number of observed variables. In this study, all measurement and structural models were over-identified.

After specifying and identifying a model, the third step is to estimate model parameters. The parameters of SEM are regression coefficients and variance/covariances of exogenous variables. The three most commonly used estimation approaches are: Maximum Likelihood (ML), Generalized

Least Square (GLS), and Asymptotic Distribution Free (ADF). Choice of approach is guided by the characteristics of the data, including sample size and distribution. ML is the most commonly used approach in SEM. It assumes multivariate normality. However, it has been found that ML estimates are quite robust to the violation of normality (Browne, 1982; Anderson and Gerbing, 1984; Muthen and Kaplan, 1985, 1992; Chou, Bentler, and Satorra, 1991; Hu, Bentler, and Kano, 1992; Hoyle, 1995; Mueller, 1997). GLS assumes multivariate normality but Jöreskog and Goldberger (1972) and Browne (1974) found that the GLS estimates are likely to be negatively biased. ADF does not assume multivariate normality but it requires a sample size above 2,500 to generate accurate estimates (Hoyle, 1995; Ullman, 2001). Therefore, the ML was used to estimate parameters in the model in this study.

Once model parameters are obtained, the fourth step is to test how well the data fit the model. If the fit is good, then the specified model is supported by the sample data, whilst if the fit is poor, then the model needs to be re-specified to achieve a better fit. Two procedures were used to test the fit of the model: the fit of individual parameters and the fit of the entire model. To test the fit of the individual parameters, two steps were used. The first step was to determine the feasibility of their estimates values. The assessment focused on whether their estimates values are in the admissible range or not. These include negative variance, correlation exceeding one, and non-positive definite correlation matrix (Byrne, 2001). None of these problems were found.

The second step in assessing the fit of individual parameters was to test their statistical significances. Parameters are considered statistically significant when their t-values ≥ 1.96 at a level of $\alpha = 0.05$. Therefore, non-significant parameters should be deleted from the model (Holmes-Smith, 2001).

The second procedure in evaluating the fit of the model was to assess the fit of the entire model. The AMOS program provides a number of fit indices. However, this study used the following major indices as recommended by Byrne (1998). These were the Chi-square (χ^2) test, the Normed chi-square (χ^2/df), Goodness-of-Fit index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). These indices are explained below.

- The traditional fit index is the chi-square χ^2 test and it is the only statistical test of significance in SEM. A non-significant chi-square value indicates that the hypothesized model fits the sample data well. The Normed chi-square is the ratio of the χ^2 divided by the degree of freedom and a value less than 3.0 indicates acceptable fit (Hu and Bentler, 1999). However, χ^2 is affected by sample size and normality of the data (Stevens, 1996; Kline, 1998; Tabachnick and Fidell, 2001; Schumacker and Lomax, 2004). Therefore, the χ^2 test should be used in combination with other indices.

- The GFI and AGFI are similar to squared multiple correlation. They indicate the relative amount of sample variance and covariance explained by the model. The AGFI differs from the GFI in that it adjusts for the number of degree of freedom in the specified model. Both indices range from zero to one, with values exceeding .90 indicating a good fit model (Byrne, 2001).
- The CFI compares the fit of the hypothesized model to an independent model or null model. Its value ranges from zero to one, with values above .90 indicating a good fit (Hu and Bentler, 1999)
- The RMSEA represents the discrepancy per degree of freedom between the population data and the hypothesized model. According to Browne and Cudeck (1993), RMSEA values of less than or equal to .05 can be considered as good fit, values between .05 and .08 as an adequate fit, and values between .08 and .10 as a mediocre fit, whereas values more than .10 are not acceptable.

The final step is model modification. If the fit of the hypothesized model is less than satisfactory, then the model can be modified to improve its fit. There are two ways to improve the fit of the model. One is to delete parameters that are not significant. However, if they are important in the theory, they should remain in the model (Schumacker & Lomax, 2004). The second way is to include additional parameters. In the AMOS program there are three techniques to modify the model: the modification index (MI), the expected parameter change statistic (EPC), and the standardized

residuals (Byrne, 2001). The MI indicates the expected drop in overall χ^2 values if each fixed parameter was to be freely estimated in a subsequent run. Larger MI for a particular fixed parameter would suggest that a better model fit by allowing this parameter to be free. The EPC statistic indicates the estimated change in the magnitude and direction of each fixed parameter if it was to be free. The standardized residuals are like Z scores. Larger values indicate that a particular relationship is not well explained by the model. Jöreskog and Sörbom (1988) suggest values greater than 2.58 be considered large.

3.8 Qualitative approach

In order to identify the factors affecting student retention at KSU, three methods of data collection were used:

- Telephone Interviews with non-persister students
- Focus groups with persister students
- Surveys of Staff members

These methods or techniques of collecting the data, and how they were used in the study are discussed in more detail below.

3.8.1 Data collection methods and participants

3.8.1.1 Pilot studies

Before the start of the main study, pilot studies were conducted. Janesick (1994) and Yin (2003) encourage the researcher to perform a pilot study when using qualitative methods. According to Janesick (1994, p. 213), 'the pilot study allows the researcher to focus on particular areas that may

have been unclear previously. In addition, pilot interviews may be used to test certain questions...Thus the time invested in a pilot study can be valuable and enriching for later phases in the study'.

The pilot studies were conducted in the middle of November 2005 with 5 non-persister students using telephone interviews, three persister students using a focus group, and three academic staff using face-to-face interviews. The main purpose of the pilot studies were to ensure that participants felt comfortable with the questions and that they understood them. In addition, it was used to test procedures, time requirements and equipment.

Face-to-face interviews were held with three staff: a counsellor, a librarian and an administrator in their offices. Each interview lasted approximately 30 minutes. A focus group with three persister students in the academic year 2005-2006 was conducted by the researcher in a classroom in the university. It lasted 45 minutes and was audio-taped.

To conduct telephone interviews with non-persister students, it was decided to select students who had left the university in the academic year 2004-2005 because their experiences would be still fresh in their minds and therefore easier to recall in detail. However, the university did not provide a list of these students for reasons associated with data protection. Therefore, the researcher had to conduct interviews with students who had just left the university in the academic year 2005-2006. One way to get a list of these students was from the library where students

had to sign a form before leaving university. The researcher requested staff at the library to ask these students to submit their names and telephone details if they were willing to be interviewed in a form (Appendix E) which contained information about the purpose of the study. Fifty three provided their names and five of these students were interviewed. Telephone interviews ranged from 10 to 20 minutes and were audio-taped by the researcher.

The pilot studies demonstrated that the questions were satisfactory and there were several benefits that accrued. The pilot studies provided an opportunity to learn to use and check the adequacy of equipment, provided the opportunity to practice the technique of conducting interviews and provided familiarity in moderating a focus group discussion.

3.8.1.2 Telephone interviews with non-persister students

Telephone interviews with non-persister students were conducted in order to get their perspective on student retention. Interviews are the most widely used methods for obtaining qualitative data (Fontana and Frey, 2000). Cannel and Kahn (1968) define the interview as: 'a two-person conversation initiated by the interviewer for the specific purpose of obtaining research-relevant information, and focused by him on content specified by research objectives of systematic description, prediction, or explanation' (in Cohen and Manion, 1994, p.271).

There are three types of interviews: structured, semi-structured, and unstructured (Patton, 2002). An unstructured interview offers maximum

flexibility for the researcher to pursue information in whatever direction appears to be appropriate (Patton, 2002). However, the discussion is not unfocused, and the researcher has a general area of interest to be pursued (Robson, 2002). The aim is for the participants to 'speak freely in their own terms about a set of concerns you bring to the interaction, plus whatever else they might introduce' (Lofland and Lofland, 1995, p. 85). This type of interview is useful in inductive research that seeks to understand complex behaviour without imposing an a priori categorisation that may limit the field of inquiry (Fontana and Frey, 2000). However, it is susceptible to researcher bias (Patton, 2002) and it is more difficult to analyse different data gathered from each interview because of the flexibility in the topic covered (Robson, 2002).

A semi-structured interview, also called a guided interview, is widely used in social research (Flick, 2002). It is based around a set of predetermined questions but the order and wording of the questions can be modified based on the participant's perception of what seems most appropriate (Robson, 2002). This type of interview ensures that the same information is pursued with each participant, but freedom exists to pursue new or unusual insights (Fontana and Frey, 2000). According to Creswell (2002, p. 205), 'the advantage of this type of interviewing is that the predetermined close-ended responses can net useful information to support theories and concepts in the literature. The open-ended responses, on the other hand, can allow the participant to provide

personal experiences that may be outside or beyond those identified in the close-ended options’.

In a structured interview, the researcher asks all participants the same series of pre-determined questions in the same sequence using essentially the same words (Fontana and Frey, 2000). This reduces the researcher bias and can be particularly useful in ensuring consistency in projects involving multiple researchers, multiple sites, or data collection at different times. However, the researcher cannot pursue topics or issues that were not anticipated when the interview questions were written (Bryman, 2004).

In this study semi-structured interviews were used for data collection because they allow full explanation of the topic and yet retain a degree of structure, which ensures most of the information obtained is relevant and manageable.

Interviews can be conducted in person or by telephone. In this study telephone interviews were used because of the locations of the participants and the limited time. Berg (2001) acknowledged that telephone interviews may provide not only an effective means for gathering data, but under certain situations it could be the only viable method. The main advantages of telephone interviews, as compared to personal interviews, are that they are exceptionally cheaper and relatively fast. The drawbacks on the other hand are that too complex and sensitive questions can not be asked (Shuy, 2003).

The criteria for selecting participants were that they were Saudi, male, full time, and withdrew in the academic year 2005-2006. From the list of withdrawn students initially obtained from the pilot study, 17 students who met the criteria were interviewed. Telephone interviews were conducted by the researcher in January 2006. Students were assured that their participation was confidential and they were encouraged to speak about their thoughts and experiences in deciding to withdraw.

Before the interviews started, students were asked whether the interview could be audio taped and were assured that the information would be used only for the purpose of the study. With students' permission, all interviews were audio taped. Each interview lasted from 10 to 20 minutes. All interviews were conducted in Arabic and were immediately fully transcribed by the researcher and later translated into English.

Interview questions were developed from Tinto's theory. They focused on students' reasons for withdrawing and whether they regarded it as permanent, temporary, or whether they might be seeking entry to some other course. They also focused on whether they had discussed their withdrawal with anyone else, their academic and social experiences and what changes KSU might make to assist students experiencing difficulties and increase its retention. A copy of the interview questions is included in Appendix C in English as well as in Arabic.

3.8.1.3 Focus groups with persister students

In order to get the perspective of current students on student retention, focus groups with persister students in the academic year 2005-2006 were conducted by the researcher in December 2005. The focus group interview can be defined as 'a research technique that collects data through group interaction on a topic determined by the researcher' (Morgan, 1996, p. 130). It was designed originally as a marketing research technique and has been adapted for research in many fields such as medicine and the social sciences (Powell and Single, 1996).

Focus groups were chosen over face-to-face interviews because greater amounts of information can be gathered in a shorter period of time (Krueger, 1994; Cohen *et al.*, 2000). Moreover, this method provides an opportunity for the researcher to observe the interaction between the participants, which sometimes provides additional valuable insights regarding the research problem (Stewart and Shamdasani, 1990). Finally, the interactions between the participants also provide an opportunity for them to guide the discussion and present information important to them that may have not been anticipated by the researcher (Bertrand *et al.*, 1992).

The criteria for selecting the participants were again that they were Saudi, male, freshmen, and full time students. Three focus groups were undertaken with between four to six students in each, with a total of 15 students involved. The first group consisted of six students from the

Education College. The second group consisted of five students from the Languages and Translation College. The third group consisted of four students from the Sciences College.

Students were given verbal and written information about the study, prior to being asked for their consent to participate in the study (Appendix F). All focus group interviews took place within the university at a time that was agreed by the students. Again, before the interviews started, students were asked whether the interview could be audio taped and were assured that the information would be used only for the purpose of the study. With students' permission, all focus group interviews were audio taped. The researcher allowed students to talk without too many interruptions and facilitated the process by listening and probing as appropriate. Creswell (2002) states that probing may be used to obtain information, clarify a point, or expand on ideas. Focus group interviews lasted between 45 and 60 minutes. Again, all focus group interviews were conducted in Arabic and were immediately fully transcribed by the researcher and later translated into English.

The questions for the focus groups were developed from Tinto's theory and were similar to those used for individual interviews with withdrawn students in addition to further questions about their current experiences and what had influenced them to continue their studies. A copy of the interview questions is included in Appendix C in English as well as in Arabic.

3.8.1.4 Staff survey

To ascertain the staff perspectives on student retention, staff, including counsellors, librarians, and administrators, were asked to complete a staff survey (Appendix D). Individual interviews, which were used for the pilot study, were not used in the main study due to the time commitment involved and the difficulty in recruitment. The form asked for staff perceptions of a number of relevant issues, including the reasons for student attrition, techniques employed to prevent attrition, and actions KSU could take to increase retention. The form was sent to 200 staff in December 2005 of whom 37 returned it.

3.8.2 Data analysis procedures

Qualitative data analysis is about making sense of collected data (Merriam, 1988). It is a complex process that involves 'working with data, organizing them, breaking them into manageable units, synthesizing them, searching for patterns, discovering what is important and what is to be learned, and deciding what you will tell others' (Bogdan and Biklen, 1992, p. 153). It may be seen as a process which includes 'both simultaneous and iterative phases' (Creswell, 2002, p. 257). This process is represented in Figure 3.4 (Creswell, 2002, p. 257).

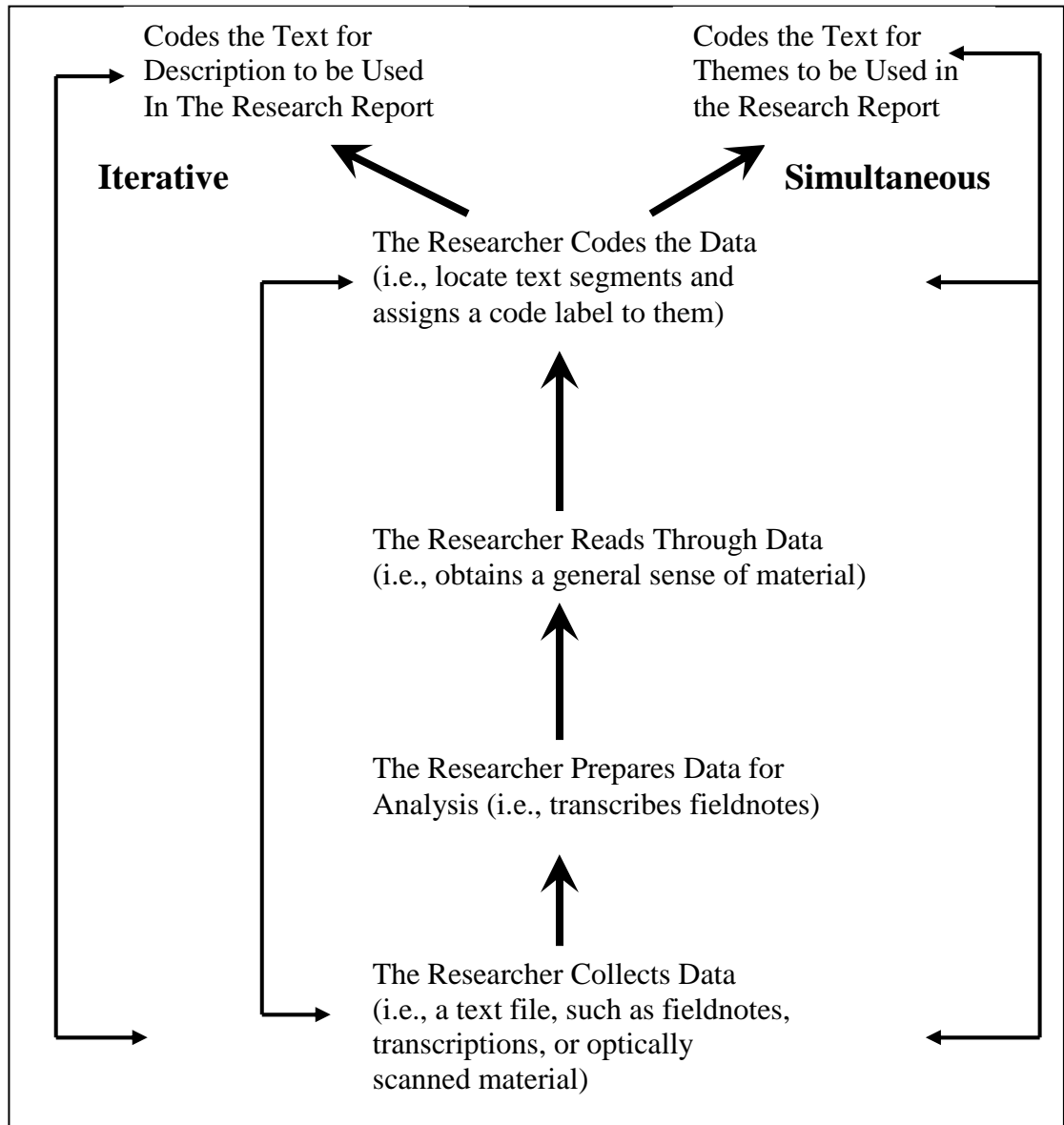


Figure 3.4 The Process of Data Analysis. (Creswell, 2002, p. 257).

Data were analysed using the constant comparative method as described by Maykut and Morehouse (1994). The constant comparative method is represented in Figure 3.5 and it

‘...combines inductive category coding with a simultaneous comparison of all units of meaning obtained ... As each new unit of meaning is selected for analysis, it is compared to all other units of meaning and subsequently grouped (categorized and coded) with similar units of

meaning... In this process there is room for continuous refinement; initial categories are changed, merged, or omitted; new categories are generated; and new relationships can be discovered...' (Maykut and Morehouse, 1994, p.134)

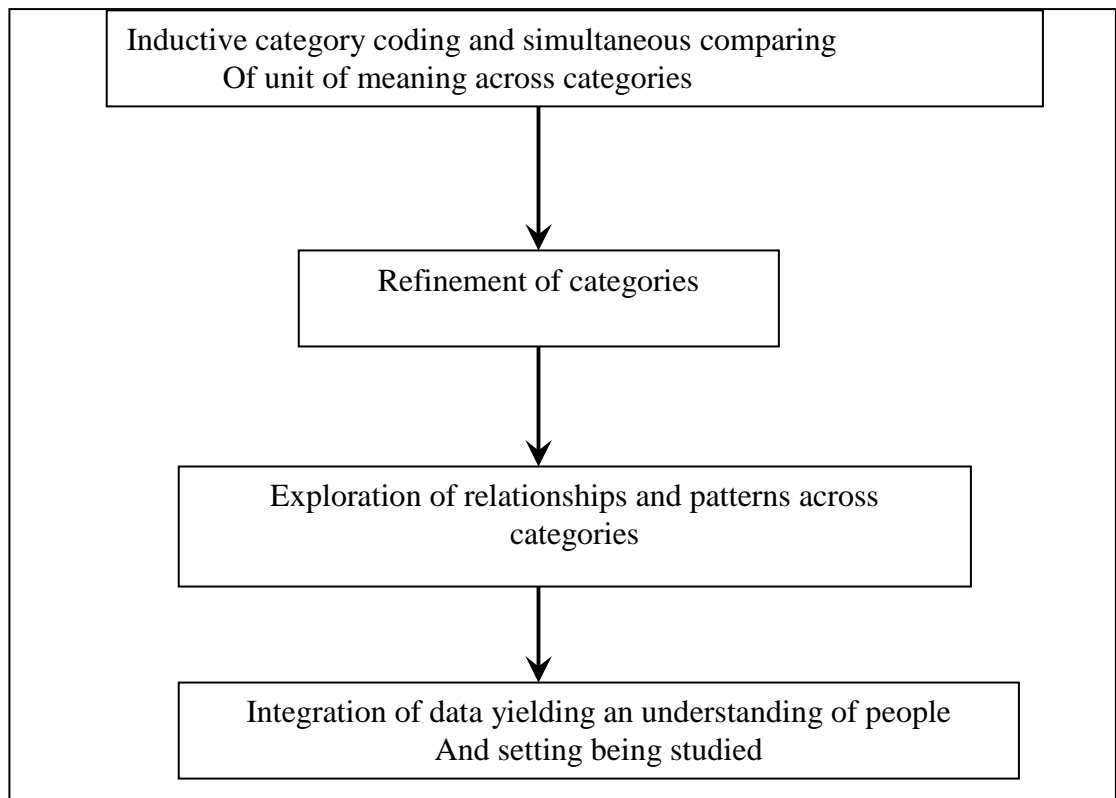


Figure 3.5 Constant Comparative method. ((Maykut and Morehouse, 1994, p.135).

There are many specialised qualitative analysis software programs. Functions of such software include data management, text retrieval, coding, and conceptual mapping. However, some of these functions, particularly data management and text retrieval, may also be performed by standard office software such as word processing programs. In addition, some concerns have been expressed about the potential for software to impose a preconceived structure on the process of analysis, and to distance the researcher from the data (Merriam, 1988). Therefore, it was

decided to analyse the data manually rather than employ specialised qualitative analysis software in order to provide the maximum scope for the researcher to work closely with the data.

The data were collected from telephone interviews, focus groups and surveys. The data from telephone interviews and focus groups were transcribed by the researcher. All transcripts and surveys were translated from Arabic to English at a translation office. In addition, Arabic and English versions were given to a member of the Language and Translation College at KSU to ensure the accuracy of the translation.

The data were coded to its source by writing the pseudonym of each participant and the number of the page on the top right of each page. For example, T I/ AL/4 refers to a Transcript (T) of the Interview (I) with Ali (AL) on page four (4). The researcher continued this way until all pages of each interview and survey had been coded.

After completing coding of the data, the researcher photocopied the original data and used the photocopies to divide the data into its separate units of meaning. A unit of meaning is a potentially meaningful segment of data that reveals information relevant to the study (Maykut and Morehouse, 1994). The researcher started by reading through the data several times. The researcher began by looking for unit of meaning. The researcher separated each unit of meaning from the next by drawing a line horizontally across the page and wrote a word or phrase which contained the main data of the unit of meaning in the margin alongside. An example

of such a unit of meaning is Ali's words in response to the question; Why do you think some students have left KSU? "*I think the most important reason for students to leave the university is that they were forced to study their majors that they do not like.*" The words "*forced to study their majors*" were written on the margin.

Then these units of meaning were cut out and pasted onto separate index cards so that it would be easy to handle them. The researcher adopted this process to find all the units of meaning from all the data collected. Then the researcher started the "discovery process" where the researcher asked himself questions such as What are the recurring words, phrases, and topics in the data? What concepts do the participants use to capture some recurring phenomenon in the data that help sensitise you to recognise it when it recurs again? Can you identify any emerging themes in your data, expressed as a phrase, proposition or question? Do you see any patterns? (Maykut and Morehouse, 1994). By answering these questions, the researcher generated a list of provisional categories.

After preparing a list of provisional categories, the researcher then selected the unit of meaning cards that could possibly fit under these provisional categories using the "look/feel alike" criteria described by Maykut and Morehouse (1994). When six or more data cards had been grouped together, the researcher then wrote a rule of inclusion based on the characteristic of cards under a particular category (Merriam, 1988). Data cards that did not fit into a particular category were categorised in a

new provisional category. This rule of inclusion then became the basis for include or exclude subsequent data cards in the category as advised by Maykut and Morehouse (1994). The researcher later wrote the rule of inclusion as a propositional statement which is defined as a statement carrying the meaning of the content of cards under a category name (Maykut and Morehouse, 1994).

3.8.3 Measures to ensure trustworthiness

The two important criteria for assessing the quality of quantitative research are reliability and validity. However, there has been some discussion about their relevance in qualitative research. Some researchers (LeCompte and Goetz, 1982; Kirk and Miller, 1986; Mason, 2002) adapted reliability and validity for qualitative research with little change of meaning. Others (Lincoln and Guba, 1985; Guba and Lincoln, 2000) have suggested that quite different criteria should be used to judge and evaluate qualitative research. They suggest that these criteria are 'credibility, transferability, dependability and confirmability' (Lincoln and Guba, 1985, pp. 289-331).

Credibility refers to the degree to which the findings and interpretations are consistent with the ideas and meanings intended by the participants. It is analogous to internal validity in quantitative research. To ensure credibility of this study, the researcher used two techniques or activities as recommended by Lincoln and Guba (1985): triangulation and peer debriefing. Triangulation typically refers to using multiple sources of data

and multiple methods of data collection (Whitt, 1991). It was achieved by using multiple sources and methods of data (17 interviews with withdrawn students, three focus groups with current students, and 37 staff surveys). Peer debriefing is the process of using peers to ensure that the researcher acknowledges the influences of personal perspectives and perceptions on the study (Whitt, 1991). In this study, continual peer debriefing was conducted with a fellow PhD student in order to provide feedback on findings as they develop.

Transferability refers to the degree that findings may be applicable or generalized to other settings or populations. It is analogous to external validity in quantitative research. However, it is not the researcher's task to decide if the findings can be generalized to other context rather the responsibility lies with the reader (Lincoln and Guba, 1985). The main technique for the purpose of transferability is 'thick description' (Lincoln and Guba, 1985). This was achieved by providing detailed descriptions of the characteristics of the study context and the methodology and research findings to allow the reader to decide if the findings are generalized to other contexts.

Dependability refers to the extent that, if the study was replicated in a similar context with similar participants, the findings would be the same. It is analogous to reliability in quantitative research. It was achieved by a description of the methods of data gathering, data analysis and

interpretation. Also, it was achieved through triangulation of multiple data sources.

Finally, confirmability refers to the extent that the findings can be confirmed by another researcher. It is analogous to objectivity in quantitative research. It was achieved by providing examples of the data and findings. Also, it was achieved by maintaining an audit trail (Lincoln and Guba, 1985). Polit and Beck (2008, p. 545) define the audit trail as 'a systematic collection of materials and documentation that would allow an independent auditor to come to conclusions about the data'.

3.9 Conclusion

This chapter has explained the study design, methods and data analyses used in the study. A triangulation study design, comprising both quantitative and qualitative approaches was used because it was considered this would generate a rich and diverse data set.

In the following three chapters the study results will be presented. Chapter Four presents the quantitative results, Chapter Five the qualitative results and Chapter Six presents the mixed methods results.

Chapter 4 - Quantitative Data Analysis

4.1 Introduction

This chapter presents the results of the quantitative data analysis. It is divided into four sections. The first section compares the participants to the population. The second section screens and cleans the data in terms of missing values, outliers, normality, and sample size requirement for SEM. The third section examines the confirmatory factor analysis of the latent variables and reliability and validity of each latent variable. The fourth section examines the structural equation modelling.

4.2 Participants and population

Quantitative data were collected from two questionnaires. The first questionnaire was administered at the beginning of the first semester. It was completed by 665 freshman students. The second questionnaire was administered to the same students at the end of the first semester. However, early attrition and class absences reduced the number to 417 students. A review of each student's records indicated that 52 of the 417 students had withdrawal voluntarily from the university at the end of their freshman year, while 362 had re-enrolled for their second year. The remaining three students had been required to withdraw for academic reasons. These students were excluded from the analysis because research has suggested that voluntary withdrawals are significantly different from forced withdrawals (Cope and Hannah, 1975; Tinto, 1993). Therefore, the final participants for the study consisted of 414 students.

Table 4.1 shows the comparisons between participants and the total freshman population with regard to high school performance, standardized test scores, freshman-year cumulative grade point average, attrition rate, and college enrolment. T-test results indicated that the 414 participants were representative of the total population from which they were drawn, with respect to high school performance, standardized test scores, and freshman-year cumulative grade point average. However, chi-square goodness-of-fit tests indicated a significant difference regarding attrition rate and college enrolment. The sample underestimated the attrition rate (12.6 percent versus 24.51 percent), and slightly underestimated the proportion of students studying at Architecture (1.45 percent versus 2.4), and slightly overestimated the proportion of students studying at Education (16.18 percent versus 14 percent).

Table 4.1 Comparisons between the Participants and the Population

	<i>Participants</i> <i>N=414</i>	<i>Population</i> <i>N=7035</i>	<i>p</i>
<i>High school performance</i>	86.61	86.98	Ns** (0.113)
<i>Standardized test scores</i>	71.43	70.61	Ns* (0.023)
<i>Grade point average.</i>	2.68	2.59	Ns* (0.019)
<i>Attrition rate</i>			.0001
<i>Persist</i>	362 (%87.40)	5311 (%75.49)	
<i>Dropout</i>	52 (%12.60)	1724 (%24.51)	
<i>College enrolment</i>			.0001
<i>Arts</i>	84 (%20.30)	1493 (%21.20)	
<i>Languages</i>	42 (% 10.14)	637 (%9.10)	
<i>Administrative Sciences</i>	97 (%23.43)	1718 (%24.40)	
<i>Education</i>	67 (%16.18)	982 (% 14.00)	
<i>Agriculture</i>	22 (%5.31)	361 (%5.10)	
<i>Sciences</i>	74 (%17.87)	1267 (%18.00)	
<i>Architecture</i>	6 (%1.45)	166 (%2.40)	
<i>Computer Sciences</i>	22 (%5.31)	411 (%5.80)	

* $\rho > 0.01$, ** $\rho > 0.10$.

4.3 Data preparation and data screening

The Institutional Integration Scales developed by Pascarella and Terenzini (1980) have been used in this study. The scales included a mix of positively and negatively worded items. In preparation for structural equation modelling analyses, the negatively worded items were reverse scored so all item responses reflected positive student integration. In addition, data were examined for missing values, outliers and normality of distributions according to the guidelines provided by Tabachnick and Fidell (2001), and Hair, Anderson, Tatham and Black (1998) through version 14.0 of the SPSS for Windows program (SPSS Inc, 2005).

4.3.1 Missing values

Missing values are common in many areas of social research. SEM requires complete data with no missing values because missing values can seriously affect results (Allison, 2002). In this study there were some missing values. Missing values were evaluated with respect to both cases and variables. Firstly, missing values were evaluated with respect to cases and their distribution is shown in Table 4.2. Most cases (94.9%) had valid, non-missing values, and just 21 cases (5.1%) had missing values. 11 cases had one item missing; 7 cases had missing data on 6 items; one case had missing data on 8 items; 7 cases had missing data on 6 items; one case had missing data on 8 items; and two cases had missing data on 9 items.

Table 4.2 The Distribution of the Number of Missing Values on Each Case

<i>Number of missing values</i>	<i>Count of cases</i>	<i>Percent</i>
0	393	94.9
1	11	2.7
6	7	1.7
8	1	0.2
9	2	0.5
TOTAL	414	100

Secondly, missing values were evaluated with respect to variables. Table 4.3 shows the number of missing values by variables. Five variables had no missing values. Three of these variables had been obtained from university admission records. These variables were high school score, general reasoning test score, and student retention behaviour. The two variables with the highest missing values were mother's education and item 2 in the second questionnaire "My non-classroom interactions with faculty have had a positive influence on my personal growth, values and attitudes" with 1.7%

and 1.2% of missing cases, respectively. Tabachnick and Fidell (2001) state that variables containing missing values on 5% or fewer of the cases can be ignored.

Table 4.3 The Number of Missing Values by Variables

<i>Number of missing values</i>	<i>Number of variables</i>	<i>Percent</i>
0	5	0
1	9	0.2
2	14	0.5
3	6	0.7
4	3	1.0
5	1	1.2
7	1	1.7

There are many methods for dealing with missing values. However, these methods depend on how the values are missing. Little and Rubin (1987) define three unique types of missing values: Missing Completely at Random (MCAR), Missing at Random (MAR), and Non-ignorable. MCAR exists when missing values are randomly distributed across all cases. MAR exists when missing values are not randomly distributed across all cases but are randomly distributed within one or more sub-samples. Non-ignorable type exists when missing values are not randomly distributed across cases but the probability of missingness cannot be predicted from the variables in the data.

Two statistical methods were used to assess the pattern of missing values using SPSS: t-test and Little's MCAR test (Hair *et al.*, 1998). First, the t-test is used to compare the cases with and without missing values for each variable on other variables. If the test is not significant, then it indicates random missing values. The t-test was performed for the two variables with the highest missing values in this study (mother's education and item 2 in the

second questionnaire). The test was not statistically significant indicating the data were missing completely at random.

Second, Little's MCAR test is a chi-square test for values missing completely at random. If the p-value for Little's MCAR test is not significant, then the data can be assumed to be MCAR. Little's MCAR test for the missing values in this study showed that the missing values can be assumed to be MCAR ($\chi^2 = 541.505$, $df = 644$, $p = 0.999$).

One method for dealing with the missing values is Listwise deletion. This method involves deleting cases with missing values from the data. It assumes the missing values are MCAR (Brown, 1994; Arbuckle, 1996; Hair *et al.*, 1998). It was decided to use this method because the missing values in the data were MCAR and the number of cases with missing values was very small. After deleting the cases with missing values, the remaining data contained 393 cases.

4.3.2 Outliers

The maximum likelihood method was used to estimate the parameters in the structural equation modelling. Since the maximum likelihood method is based on the assumption of normality, the variables were examined for outliers and normality (Hair *et al.*, 1998; Tabachnick and Fidell, 2001).

Outliers are extreme cases on one variable or on a combination of variables. Tabachnick and Fidell (2001) state that univariate outliers are cases with an extreme value on one variable and multivariate outliers are cases with unusual combinations of scores on two or more variables.

One way to identify univariate outliers is to convert the values of each variable to standard (i.e. Z) scores with a mean of 0 and a standard deviation of 1. Hair *et al.* (1998) recommend considering cases with Z scores ranging from 3 to 4 to be outliers for a large data set (more than 80 cases). Tabachnick and Fidell (2001) suggest cases with Z scores higher than 3.29 ($p < .001$, two-tailed test) to be outliers. However, the critical Z score depends on the size of the sample. Two variables (item 27 and high school scores) had 22 cases with Z scores more than 3.29. There were nineteen cases with Z scores of -3.30 on item 27; and one case with Z scores of -3.53 and two cases with Z scores of -3.33 on high school scores variable.

One statistical method of assessing the multivariate outliers is to compute each case's Mahalanobis distance. The Mahalanobis distance statistic D^2 measures the multivariate distance between each case and the group multivariate mean. Each case is evaluated using the chi-square distribution with alpha level of .001. A case is a multivariate outlier if the probability associated with its D^2 is 0.001 or less (Hair *et al.*, 1998; Tabachnick and Fidell, 2001). Multivariate outlier detection using Mahalanobis D^2 identified two cases (case 177 and 370) as significantly different. These two cases also appeared in the univariate outlier detection.

Because only a small number of univariate outliers were identified and the Z scores of these outliers were not so extreme, the decision was made not to delete them. Cohen and Cohen (1983) state that 'if outliers are few and not very extreme, they are probably best left alone' (p. 128). The two multivariate

outliers (case 177 and 370) were deleted because their D^2 (117.70 and 103.48) were very high compare to other cases and they appeared to be also univariate outliers. After deleting these two cases, the remaining data consisted of 391 cases.

4.3.3 Normality of distribution

Several graphical and statistical methods were used to examine the normality distribution of the observed variables using SPSS. Graphical methods included frequency histograms, normality plots, expected normal probability plots and detrended expected normal probability plots. A visual inspection of these graphical methods did not reveal any violations of normality assumptions. The frequency histograms and the normality plots for each variable are shown in Appendix G.

The two statistical methods to assess the normality distributions of the variables are skewness and kurtosis. Skewness is the measure of the symmetry of a distribution and kurtosis is the measure of the peakedness or flatness of a distribution (Tabachnick and Fidell, 2001). A distribution is regarded to be normal when the values of skewness and kurtosis are equal to zero. However, there are no formal cut-off points on the levels of skewness and kurtosis to indicate when variables are no longer regarded as normal (Curran, West and Finch, 1996). Tabachnick and Fidell (2001) suggest that skewness and kurtosis values should be within the range of - 2 to +2 when the variables are normally distributed. Monte Carlo simulations suggest that a skewness value smaller than 2.00 and a kurtosis value smaller than 7.00 can

be considered normal; skewness values ranging from 2.00 to 3.00 and kurtosis values ranging from 7.00 to 21.00 are considered moderately non-normal, and skewness value greater than 3.00 and kurtosis value greater than 21.00 are considered extremely non-normal (Curran, West and Finch, 1996). Kline (1998) suggests that variables with values of skewness greater than 3.00 are considered as extremely skewed and variables with values of kurtosis greater than 8.00 are considered as having extreme kurtosis.

Table 4.4 displays the means, the standard deviations, and skewness and kurtosis for the variables. As seen in Table 4.4, no variables had skewness greater than 3.00 and no variables had kurtosis greater than 5.00. The results indicated that all the variables can be considered normally distributed. Therefore, the maximum likelihood estimation can be used in testing the structural model in this study (Hair *et al.*, 1998).

4.3.4 Sample size

SEM requires a large sample size in order to obtain reliable and meaningful parameter estimates (Hair *et al.*, 1998). However, there is no agreement on how large a sample size is needed for conducting SEM (Hair *et al.*, 1998). Anderson and Gerbing (1988) consider sample sizes between 100 and 150 as the minimum for conducting SEM. Kline (1998) suggests that sample sizes below 100 could be considered small, between 100 and 200 cases as medium size and samples that exceed 200 cases could be considered as large. However, models with more parameters require a larger sample. Hair *et al.* (1998) recommend that the minimum sample size be at least greater

than the number of free parameters. Bentler (1985) identifies that a ratio of at least five cases per estimated free parameter is adequate to obtain meaningful estimates. Mueller (1997) suggests that the ratio of the number of cases to the number of observed variables is recommended to be at least 10:1.

The sample size used in this study meets these recommendations. The sample size is 391, which is obviously greater than 200 cases. In addition, as there were 56 free parameters and 23 observed variables in the hypothesis structural model, the ratio of the number of sample to the number of free parameters in model was 7:1. The ratio of the number of cases to the number of observed variables was 17:1. Therefore, the SEM analysis could be conducted without a further problem.

Table 4.4 Descriptive Statistics for the Variables used in the Model (n=391)

<i>Variable</i>	<i>Mean</i>	<i>SD</i>	<i>Skewness</i>	<i>Kurtosis</i>	<i>Mini mum</i>	<i>Maxi mum</i>
Family Background						
<i>Mother Education</i>	2.08	1.22	0.74	-0.74	1	5
<i>Father Education</i>	2.67	1.28	0.11	-1.15	1	5
Pre-college Schooling						
<i>High School Score</i>	86.82	4.27	-0.11	0.75	71.6	98.6
Individual Attributes						
<i>General Reasoning Score</i>	71.24	7.28	-0.07	0.04	49.0	91.0
Initial Commitments (First Questionnaire)						
<i>Item 1</i>	4.32	1.12	-1.79	2.32	1	5
<i>Item2</i>	4.06	1.04	-1.31	1.50	1	5
<i>Item3</i>	3.98	1.21	-1.11	0.28	1	5
<i>Item4</i>	4.35	1.05	-1.76	2.36	1	5
<i>Item5</i>	4.46	1.05	-2.24	4.31	1	5
Peer-Group Interactions						
<i>Item1</i>	3.71	1.05	-0.85	0.21	1	5
<i>Item6</i>	3.90	1.02	-1.16	1.14	1	5
<i>Item11</i>	3.56	1.14	-0.76	-0.20	1	5
<i>Item16</i>	3.47	1.06	-0.61	-0.11	1	5
<i>Item21</i>	3.52	1.21	-0.50	-0.71	1	5
<i>Item25</i>	2.91	1.16	0.13	-0.77	1	5
<i>Item28</i>	2.56	1.14	0.38	0.64	1	5
Interactions with Faculty						
<i>Item2</i>	2.98	1.10	-0.19	-0.42	1	5
<i>Item7</i>	2.84	1.03	-0.34	-0.20	1	5
<i>Item12</i>	3.29	1.01	-0.29	-0.25	1	5
<i>Item17</i>	2.75	1.31	0.09	-1.21	1	5
<i>Item22</i>	3.03	1.19	-0.19	-0.78	1	5
Faculty Concern for Student Development and Teaching						
<i>Item3</i>	2.94	1.11	0.13	-0.47	1	5
<i>Item8</i>	2.76	1.15	0.26	-0.71	1	5
<i>Item13</i>	2.85	1.28	0.30	-0.91	1	5
<i>Item18</i>	3.13	1.26	-0.28	-0.89	1	5
<i>Item23</i>	3.09	1.21	-0.08	-0.88	1	5
Academic and Intellectual Development						
<i>Item4</i>	3.83	1.11	-1.10	0.58	1	5
<i>Item9</i>	3.51	0.94	-0.39	-0.04	1	5
<i>Item14</i>	3.70	1.10	-0.89	0.17	1	5
<i>Item19</i>	2.63	1.18	0.39	-0.79	1	5
<i>Item24</i>	3.72	1.03	-0.76	0.13	1	5
<i>Item26</i>	2.97	1.26	-0.10	-1.03	1	5
<i>Item29</i>	3.10	1.10	-0.13	-0.60	1	5
Later Commitments						
<i>Item5</i>	4.27	1.20	-1.62	1.40	1	5
<i>Item10</i>	4.08	1.09	-1.21	0.79	1	5
<i>Item15</i>	3.93	1.17	-0.86	-0.07	1	5
<i>Item20</i>	4.30	1.15	-1.65	1.69	1	5
<i>Item27</i>	4.48	1.05	-2.19	3.95	1	5

4.4 Measurement models

As recommended by Jöreskog (1993), Castaneda (1993), and Anderson and Gerbing (1988), a two-step structural equation modelling procedure was employed in this study for estimating parameters: a measurement model followed by a structural model. The measurement model is a confirmatory factor analysis (CFA). The purpose of the measurement model is to specify the relationships between observed variables and latent variables. Further, the structural model specifies the relationships among latent variables. It specifies which latent variables directly or indirectly influence changes in the values of other latent variables in the model (Schumacker and Lomax, 2004).

The CFA using the AMOS program focused on the four latent variables (initial goal and institutional commitments, later goal and institutional commitments, academic integration, and social integration) and 34 observed variables. The CFA provides an assessment of the reliability and validity of the observed variables for each latent variable (Jöreskog and Sörbom, 1989). Reliability of the observed variable refers to the degree of variance explained by the construct rather than by error. It is measured by squared factor loadings. Observed variables are considered to have high reliability when the squared factor loading for each one is more than 0.50, moderate if between .30 and .50 and poor if below 0.30 (Holmes-Smith, 2001). Therefore, in this study any observed variables where their squared factor loadings less than 0.20 should be deleted from the model.

Validity is the extent to which the observed variables accurately measure what they are supposed to measure (Hair *et al.*, 1998). Validity is obtained when the relationship between the observed variable and latent variable is statistically significant (Anderson and Gerbing, 1988).

All the measurement models were over identified and the Maximum Likelihood estimation method was used for estimating parameters. Two procedures were used to test the fit of the measurement model: the fit of individual parameters and the fit of the entire model. To test the fit of the individual parameters, two steps were used. The first step was to determine the feasibility of their estimates values. The assessment focused on whether their estimates values are in the admissible range or not. These include negative variance, correlation exceeding one, and Non-positive definite correlation matrix (Byrne, 2001). None of these problems were found when performing CFA for each later variable.

The second step in assessing the fit of individual parameters was to test their statistical significances. Parameters are considered statistically significant when their t-values ≥ 1.96 at a level of $\alpha = 0.05$. Therefore, non-significant parameters should be deleted from the model (Holmes-Smith, 2001).

The second step in evaluating the fit of the measurement model was to assess the fit of the entire model. The AMOS program provides a number of fit indices. However, this study used the following major indices as recommended by Byrne (1998). These were the Chi-square (χ^2) test, the Normed chi-square (χ^2/df), Goodness-of-Fit index (GFI), Adjusted Goodness-

of-Fit Index (AGFI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). These indices are explained below.

- The traditional fit index is the chi-square χ^2 test and it is the only statistical test of significance in SEM. A non-significant chi-square value indicates that the hypothesized model fits the sample data well. The Normed chi-square is the ratio of the χ^2 divided by the degree of freedom and a value less than 3.0 indicates acceptable fit (Hu and Bentler, 1999). However, χ^2 is affected by sample size and normality of the data (Stevens, 1996; Kline, 1998; Tabachnick and Fidell, 2001; Schumacker and Lomax, 2004). Therefore, the χ^2 test should be used in combination with other indices.
- The GFI and AGFI are similar to squared multiple correlation. They indicate the relative amount of sample variance and covariance explained by the model. The AGFI differs from the GFI in that it adjusts for the number of degree of freedom in the specified model. Both indices range from zero to one, with values exceeding .90 indicating a good fit model (Byrne, 2001).
- The CFI compares the fit of the hypothesized model to an independent model or null model. Its value ranges from zero to one, with values above .90 indicating a good fit (Hu and Bentler, 1999)

- The RMSEA represents the discrepancy per degree of freedom between the population data and the hypothesized model. According to Browne and Cudeck (1993), RMSEA values of less than or equal to .05 can be considered as good fit, values between .05 and .08 as an adequate fit, and values between .08 and .10 as a mediocre fit, whereas values more than .10 are not acceptable.

When all or most of the fit indices did not indicate an acceptable level of fit, the model was modified until the fit indices achieved an acceptable level. Three techniques were used to modify the model: the modification index (MI), the expected parameter change statistic (EPC), and the standardized residuals (Byrne, 2001). The MI indicate the expected drop in overall χ^2 values if each fixed parameter was to be freely estimated in a subsequent run. A larger MI for a particular fixed parameter would suggest that a better model fit by allowing this parameter to be free. The EPC statistic indicates the estimated change in the magnitude and direction of each fixed parameter if it is was to be free. The standardized residuals are like the Z scores. Larger values indicate that a particular relationship is not well explained by the model. Jöreskog and Sörbom (1988) suggest values > 2.58 to be considered large.

4.4.1 Confirmatory factor analysis for Initial and Later Goal and Institutional Commitments

Initial and later goal and institutional commitments were measured with the goal/institutional scale developed by Pascarella and Terenzini (1980) in the first and second questionnaires. This scale comprised of six items. However,

one item “I have no idea what I want to major in” was deleted because it did not apply to Saudi Higher Education, as all students select their majors from the first year. Therefore, the original measurement model was a two-factor model comprised of ten observed variables.

The results of the initial measurement model did not fit the data well. The chi-square of 189.85 with 34 degree of freedom was statistically significant at $p < 0.05$, indicating a poor fit. The other fit statistics also indicated that the model was not acceptable ($\chi^2/df = 5.58$; GFI=0.91; AGFI= 0.85; CFI= 0.82; RMSEA= 0.11). Moreover, the results indicated that four observed variables (Item 3 in the first questionnaire, Item 10, Item 15, and Item 27 in the second questionnaire) had very poor reliabilities. In other words, their squared factor loadings were less than 0.20. Thus, the initial model was modified.

The first modified model was developed by deleting these four observed variables from the initial model. The results yielded a moderate lack of fit between the model and the data. The chi-square of 61.03 with 8 degree of freedom was statistically significant at $p < 0.05$. The other fit statistics indicated the model was not acceptable ($\chi^2/df = 7.63$; GFI=0.95; AGFI= 0.87; CFI= 0.92; RMSEA= 0.13). Thus, the model was modified. The Modification index suggested that two sets of correlated error terms between item 1 and item 5, and between item 4 and item 20 would statistically improve model fit. Jöreskog (1993) states that ‘every correlation between error terms must be justified and interpreted substantively’ (p. 297). Byrne (2001) suggests that correlated error terms between item pairs are often an indication of a high

degree of overlap in item content. Allowing the error terms of each pair to be correlated seems to be both statistically acceptable and conceptually meaningful because these observed variables are the same variables measuring students' commitments in the first and second questionnaires.

The second modified model was developed by allowing the error terms to be correlated between item1 and item 5, and between item 4 and item 20. The results yielded a moderate lack of fit between the model and the data. The chi-square of 41.73 with 6 degree of freedom was statistically significant at $p < 0.05$. The other fit statistics indicated the model was not acceptable ($\chi^2/df = 6.96$; GFI=0.97; AGFI= 0.88; CFI= 0.95; RMSEA= 0.12). Thus, the model was modified. The Modification index also indicated that a correlation of the error terms between Item 1 and Item 20 would also significantly improve the model fit. By looking at Item 1 "It is important for me to graduate from university" and Item 20 "It is not important to me to graduate from King Saud University", the two observed variables are related to the same construct "Commitments" and also have same words or phrase. Therefore, allowing their error terms to be correlated seems to be statistically acceptable and conceptually meaningful.

The third and final modified commitments model was developed by allowing the error terms to be correlated between Item 1 and Item 20. The results yielded a good fit between the model and the data. The chi-square of 11.62 with 5 degree of freedom was not statistically significant at $p < 0.05$, indicating a good fit. The other fit statistics indicated the model was also acceptable

($\chi^2/df = 2.32$; GFI=0.99; AGFI= 0.96; CFI= 0.99; RMSEA= 0.05). In addition, examining the standardized residual covariances for the final model, presented in Table 4.5, showed that no value exceeded the cut-point of 2.58. The highest value was -1.43. This confirmed that the third model was a good fit of the data. Table 4.6 provides the final results of confirmatory factor analysis for the commitments. The final measurement model for the initial commitment has four observed variables and the later commitment has two observed variables. As shown in Table 4.6, all of the observed variables demonstrated factor loadings of .64 or greater and were statistically significant. This provides evidence of good validity. In addition, the reliability of the observed variables ranged from .41 to .60, indicating a good level of reliability. The measurement models for Initial and Later Commitments are shown graphically in Figure 4.1.

Table 4.5 Standardized Residual Covariances (Final Model)

	<i>Item 20</i>	<i>Item 5</i>	<i>Item 5</i>	<i>Item 4</i>	<i>Item 2</i>	<i>Item 1</i>
<i>Item 20</i>	.2661					
<i>Item 5</i>	.3229	.0000				
<i>Item 5</i>	-.6316	-1.4303	.0000			
<i>Item 4</i>	.7024	1.4081	.1351	.0000		
<i>Item 2</i>	-.4018	-.5279	.1179	-.2364	.0000	
<i>Item 1</i>	.0494	.0000	-.4304	.1823	.2004	.0000

Table 4.6 CFA for Initial and Later Goal and Institutional Commitments

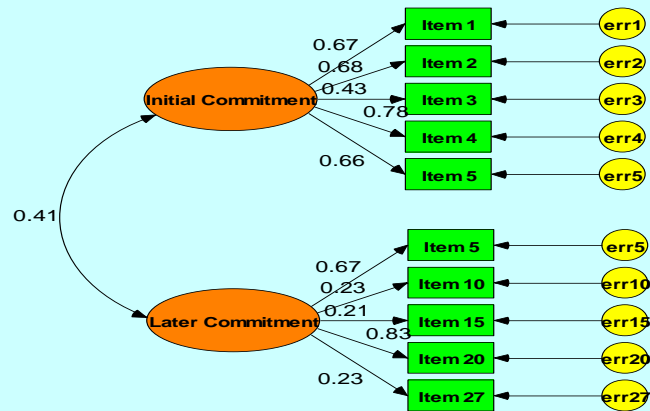
<i>Constructs and indicators</i>	<i>Standardized factor loadings</i>	<i>Standard Error of Estimates</i>	<i>T-values</i>	<i>p</i>	<i>Observed variable reliability</i>	<i>Error variance</i>
<i>Initial commitments</i>						
<i>Item 1</i>	0.64				0.41	0.59
<i>Item 2</i>	0.68	0.09	10.42	0.000	0.47	0.53
<i>Item 4</i>	0.77	0.10	11.10	0.000	0.60	0.40
<i>Item 5</i>	0.71	0.09	10.66	0.000	0.50	0.50
<i>Later commitments</i>						
<i>Item 5</i>	0.74				0.55	0.45
<i>Item 20</i>	0.75	0.25	3.67	0.000	0.56	0.44

4.4.2 Confirmatory factor analysis for Social Integration

Social integration was measured with two scales developed by Pascarella and Terenzini (1980): Peer-Group Interactions and Interaction with Faculty. The Peer-Group Interactions scale had seven items and the Interactions with Faculty scale had five items. Therefore, the original measurement model of social integration was a two-factor model comprised of twelve observed variables.

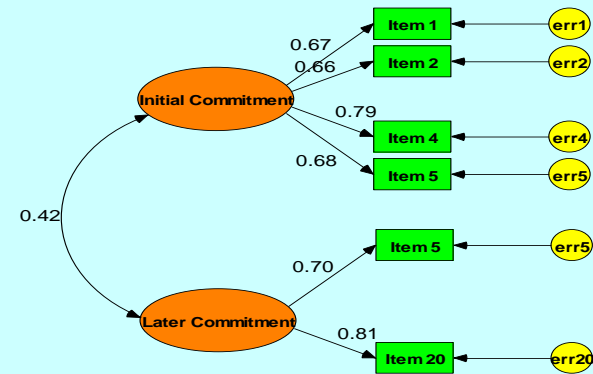
The results of the initial measurement model of social integration indicated that the model did fit the data well. Although the chi-square of 122.85 with 53 degree of freedom was statistically significant at $p < 0.05$, indicating inappropriate fit, the other fit statistics indicated the model was acceptable ($\chi^2/df = 2.31$; GFI=0.94; AGFI= 0.92; CFI= 0.90; RMSEA= 0.06). However, the results indicated that one observed variable (Item 28) was not significant as indicated by its t-value (1.66). In addition, four observed variables (Item 17, Item 21, Item 22, and Item 25) had very poor reliabilities as their squared factor loadings were less than 0.20. Thus, the model was modified.

Initial Model



$\chi^2= 189.85, \chi^2/df = 5.58, GFI= 0.91, AGFI =0.85, CFI=0.82, RMSEA= 0.11.$

First Modified Model



$\chi^2= 61.03, \chi^2/df = 7.63, GFI= 0.95, AGFI =0.87, CFI=0.92, RMSEA= 0.13.$

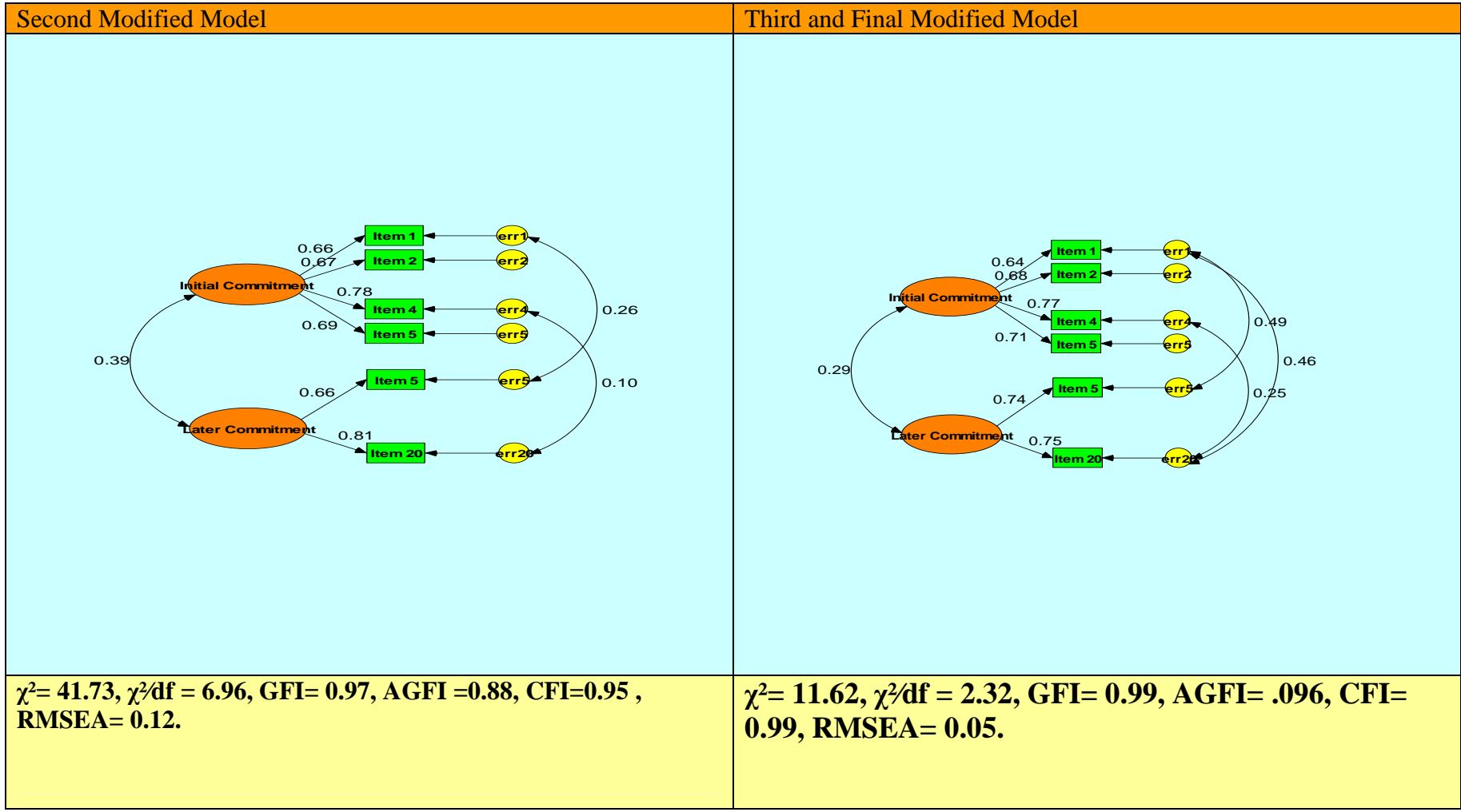


Figure 4.1 The Measurement Models for Initial and Later Goal and Institutional Commitments

The first modified social integration model was developed by deleting these five observed variables from the initial model. The results yielded a moderate lack of fit between the model and the data. The chi-square of 64.28 with 13 degree of freedom was statistically significant at $p < 0.05$. The other fit statistics indicated the model was not acceptable ($\chi^2/df = 4.94$; GFI=0.95; AGFI= 0.90; CFI= 0.91; RMSEA= 0.10). Thus, the model was modified. The Modification index suggested that a correlation of the error terms between Item 1 and Item 6 would statistically improve the model fit. By looking at Item 1 “Since coming to this university, I have developed close personal relationships with other students” and Item 6 “The student friendships that I have developed at this university have been personally satisfying”, the two observed variables are related to the same construct “Social Integration” and also have same words or phrase. Therefore, allowing their error terms to be correlated seems to be statistically acceptable and conceptually meaningful.

The second and final modified social integration model was developed by allowing the error terms between Item 1 and Item 6 to be correlated. The results yielded a good fit between the model and data. The chi-square of 42.70 with 12 degree of freedom was not statistically significant at $p < 0.05$. The other fit statistics indicated the model was acceptable ($\chi^2/df = 3.55$; GFI=0.97; AGFI= 0.93; CFI= 0.95; RMSEA= 0.08). In addition, examining the standardized residual covariances for the second model, presented in Table 4.7, revealed that no value exceed the cut-point of 2.58. The highest value was 2.12. This confirmed that the second model was a good fit of the data. Table 4.8 provides the final results of confirmatory factor analysis for the

social integration. The final measurement model for social integration has seven observed variables. As shown in Table 4.8, the factor loadings of the observed variables ranged from .45 to .79 and were statistically significant. This provides evidence of validity. In addition, the reliability of the observed variables ranges from .20 to .63, indicating a moderate reliability level. The measurement models for Social Integration are shown graphically in Figure 4.2.

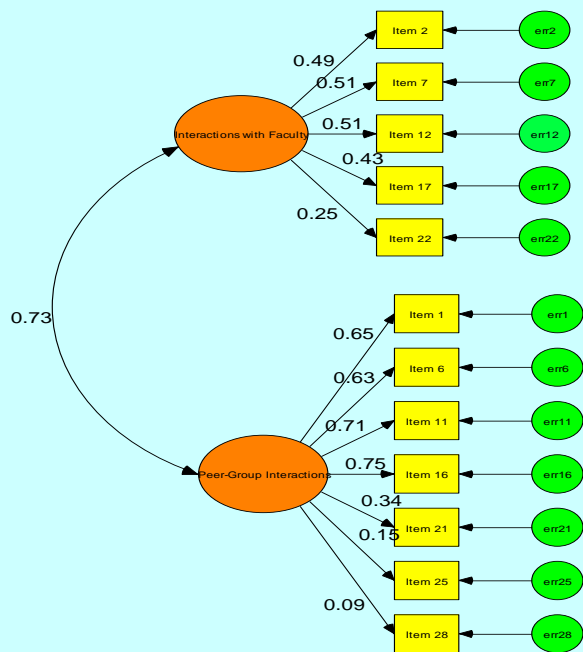
Table 4.7 Standardized Residual Covariances (Final Model)

	<i>Item 16</i>	<i>Item 11</i>	<i>Item 6</i>	<i>Item 1</i>	<i>Item 12</i>	<i>Item 7</i>	<i>Item 2</i>
<i>Item 16</i>	.0000						
<i>Item 11</i>	.0544	.0000					
<i>Item 6</i>	-.4007	.0516	.0000				
<i>Item 1</i>	-.1221	.4012	.0000	.0000			
<i>Item 12</i>	.8298	.9443	1.4129	-1.0441	.0000		
<i>Item 7</i>	.1792	-1.4742	-.1921	-.3676	-1.1251	.0000	
<i>Item 2</i>	-.6339	-1.2811	.6310	.5852	-1.0252	2.1235	.0000

Table 4.8 CFA for Social Integration

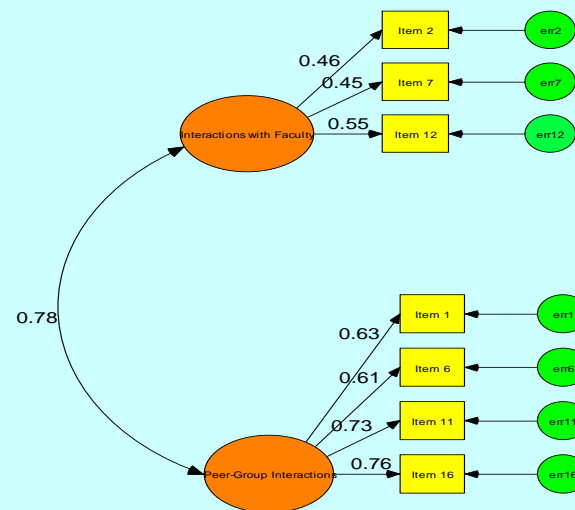
<i>Constructs and indicators</i>	<i>Standardized factor loadings</i>	<i>Standard Error of Estimates</i>	<i>t-values</i>	<i>p</i>	<i>Observed variable reliability</i>	<i>Error variance</i>
<i>Social integration</i>						
<i>Item 1</i>	0.57				0.33	0.67
<i>Item 6</i>	0.56	0.09	9.78	0.000	0.31	0.69
<i>Item 11</i>	0.74	0.14	9.78	0.000	0.55	0.45
<i>Item 16</i>	0.79	0.14	9.91	0.000	0.63	0.37
<i>Item 2</i>	0.45				0.20	0.80
<i>Item 7</i>	0.45	0.17	5.14	0.000	0.20	0.80
<i>Item 12</i>	0.56	0.19	5.25	0.000	0.31	0.69

Initial Model



$\chi^2=122.85$, $\chi^2/df= 2.31$, GFI= 0.94, AGFI= 0.92, CFI= 0.90, RMSEA=0.06.

First Modified Model



$\chi^2=64.28$, $\chi^2/df= 4.94$, GFI= 0.95, AGFI= 0.90, CFI= 0.91, RMSEA=0.10.

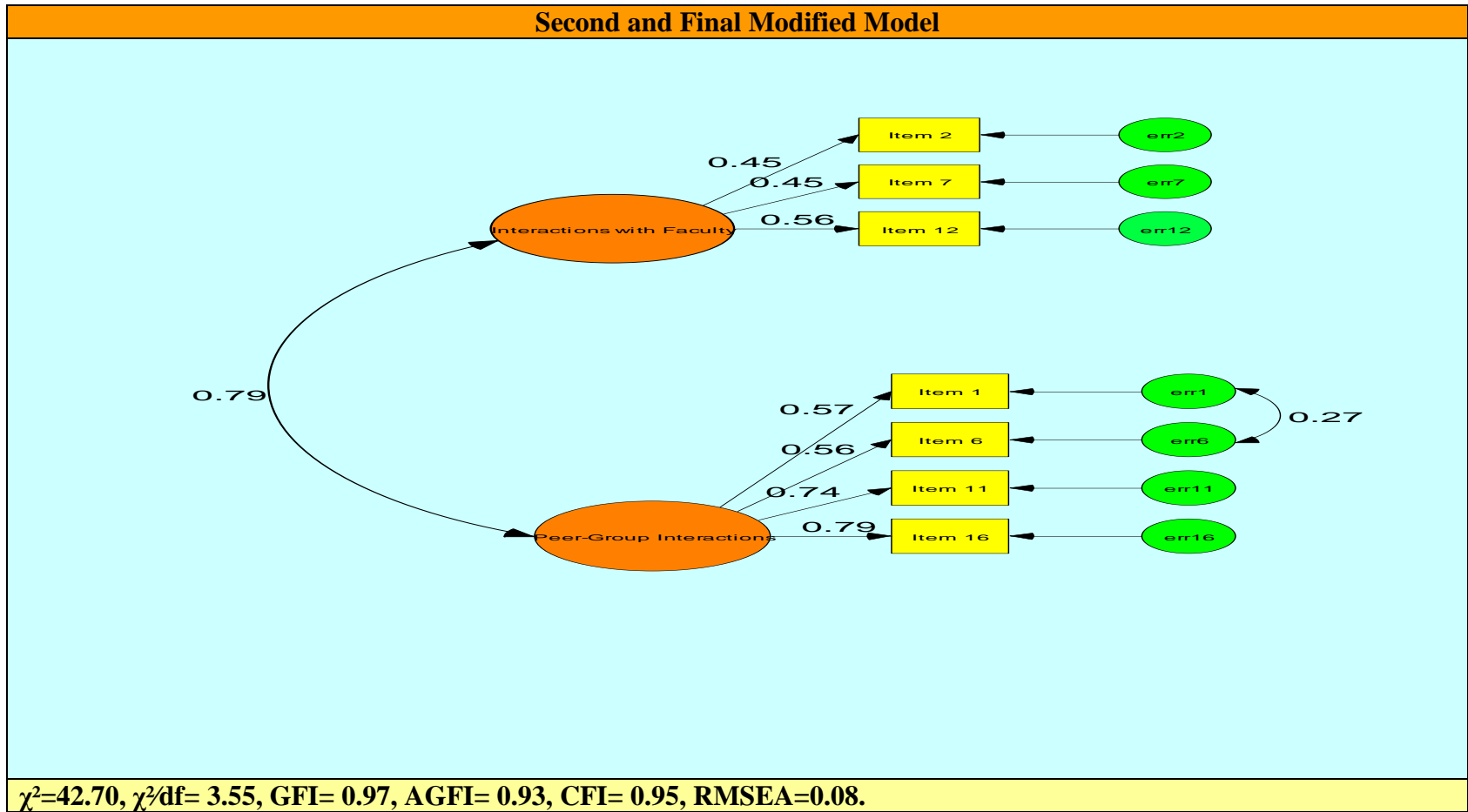


Figure 4.2 The Measurement Models for Social Integration

4.4.3 Confirmatory factor analysis for Academic integration

Academic integration was measured with two scales developed by Pascarella and Terenzini (1980): Faculty Concern for Student Development and Teaching scale and Academic and Intellectual Development scale. The Faculty Concern for Student Development and Teaching scale had five items and the Academic and Intellectual Development scale had seven items. Thus, the original measurement model of academic integration was a two-factor model comprised of twelve observed variables.

The initial measurement estimation of the academic integration model showed that the model did fit the data well. The chi-square of 87.63 with 53 degree of freedom was statistically significant at $p < 0.05$. The other fit statistics indicated the model was acceptable ($\chi^2/df = 1.65$; GFI=0.96; AGFI= 0.94; CFI= 0.92; RMSEA= 0.04). However, the results indicated that two observed variable (Item 8 and item 13) was not significant as indicated by their t-value (0.832 and 1.900). In addition, five observed variables (item 3, item 9, item 19, item 26, and item 29) had very poor reliabilities as their squared factor loadings were less than 0.20. Thus, the model was modified.

The first and final modified academic integration model was developed by deleting these seven observed variables from the initial model. The results yielded a perfect fit between the model and data. The chi-square of 4.25 with 4 degree of freedom was not statistically significant at $p < 0.05$, indicating a good fit. The other fit statistics indicated the model was acceptable ($\chi^2/df = 1.06$; GFI=0.99; AGFI= 0.98; CFI= 1; RMSEA= 0.01). In addition, examining

the standardized residual covariances for the first modified model, presented in Table 4.9, showed that no value exceeded the cut-point of 2.58. The highest value was – 0.84. This confirmed that the first modified model was a good fit of the data. Table 4.10 provides the final results of confirmatory factor analysis for the academic integration. The final measurement model for academic integration has five observed variables. As shown in Table 4.10, the factor loadings of the observed variables ranged from .45 to .74 and were statistically significant, indicating evidence of validity. In addition, the reliability of the observed variables ranged from .20 to .55, indicating a moderate reliability level. The measurement models for Academic Integration are shown graphically in Figure 4.3.

Table 4.9 Standardized Residual Covariances (Final Model)

	<i>Item 24</i>	<i>Item 14</i>	<i>Item 4</i>	<i>Item 23</i>	<i>Item 18</i>
<i>Item 24</i>	.0000				
<i>Item 14</i>	.2050	.0000			
<i>Item 4</i>	-.0775	-.0963	.0000		
<i>Item 23</i>	-.8449	.4151	.0267	.0000	
<i>Item 18</i>	-.7798	.0139	.5044	.0000	.0000

Table 4.10 CFA for Academic Integration

<i>Constructs and indicators</i>	<i>Standardized factor loadings</i>	<i>Standard Error of Estimates</i>	<i>t-values</i>	<i>P</i>	<i>Observed variable reliability</i>	<i>Error variance</i>
<i>academic integration</i>						
<i>Item 18</i>	0.72				0.52	0.48
<i>Item 23</i>	0.45	0.13	3.77	0.000	0.20	0.80
<i>Item 4</i>	0.68				0.46	0.54
<i>Item 14</i>	0.74	0.11	9.02	0.000	0.55	0.45
<i>Item 24</i>	0.57	0.09	8.45	0.000	0.33	0.67

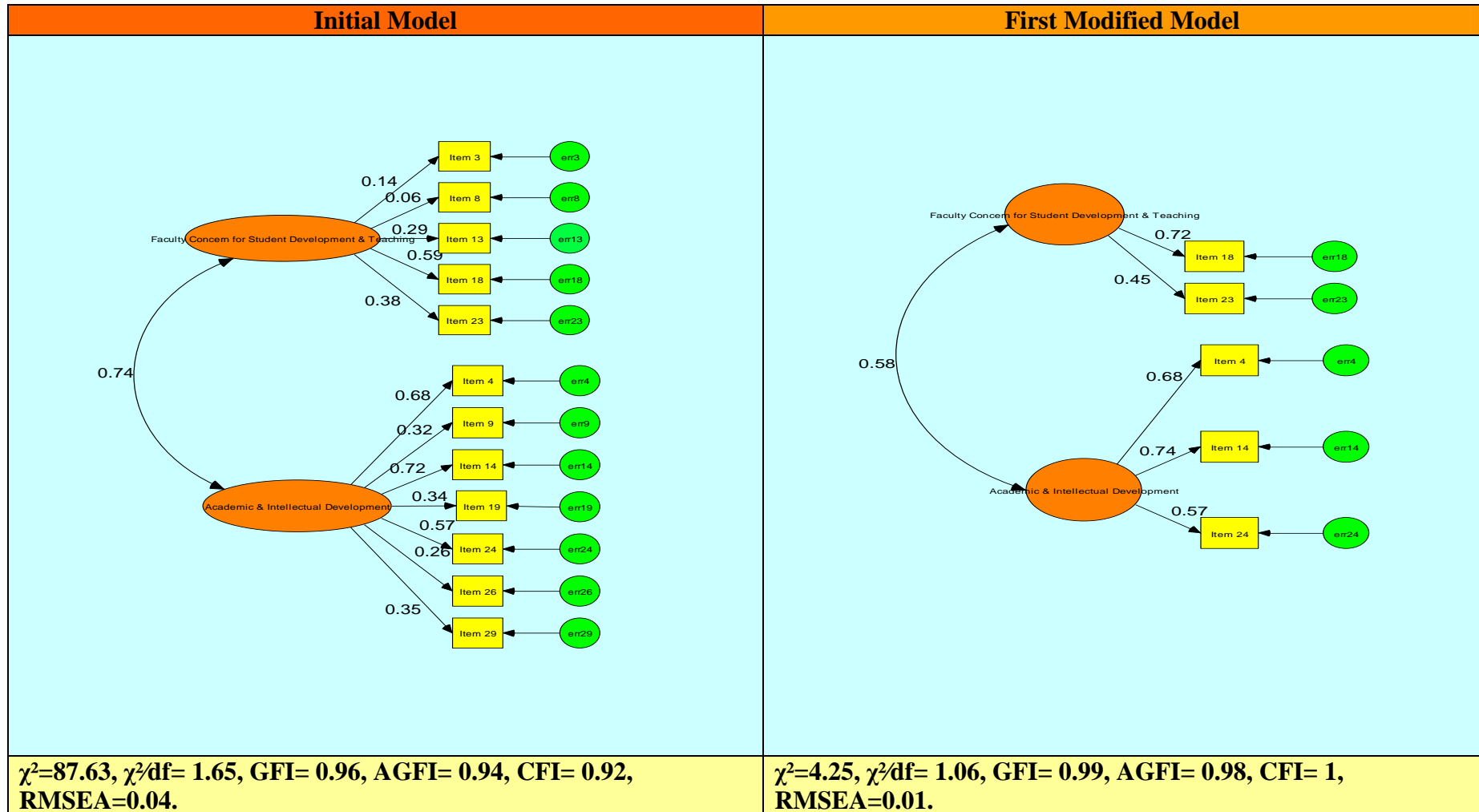


Figure 4.3 The measurement Models for Academic Integration

4.5 Structural model

After establishing and confirming the measurement model, the next step was to test the structural model using the Amos program. The structural model defines the relationships between the latent variables or the constructs. It specifies which latent variables directly or indirectly influence changes in the values of other latent variables in the model (Byrne, 2001). The theoretical structural model is shown in Figure 4.4.

4.5.1 Analysis of structural models

The results of the theoretical structural model indicated that the chi-square of 603.45 with 220 degree of freedom was statistically significant at $p < 0.05$, indicating an inappropriate fit. However, it has been stated that the chi-square is highly sensitive to sample size and usually suggests a poor fit with large sample sizes (Byrne, 2001). Other fit statistics were within the acceptable values except for GFI, AGFI and CFI, which were slightly lower than the commonly acceptable values of 0.90 ($\chi^2/df = 2.73$; GFI= 0.88; AGFI=0.85; CFI=0.82; RMSEA =0.07). Overall, the fit statistics indicated a moderate fit between the data and the theoretical model.

The standardized path coefficients for the theoretical structural model are presented in Figure 4.5. Five of the nine hypothesized paths were at least significant at $p < 0.05$. The five significant paths were family background → Initial Commitment, Initial Commitment → Academic Integration, Initial Commitment → Social Integration, Initial commitment → Later Commitment, and from Later Commitment → Retention. The other four hypothesized

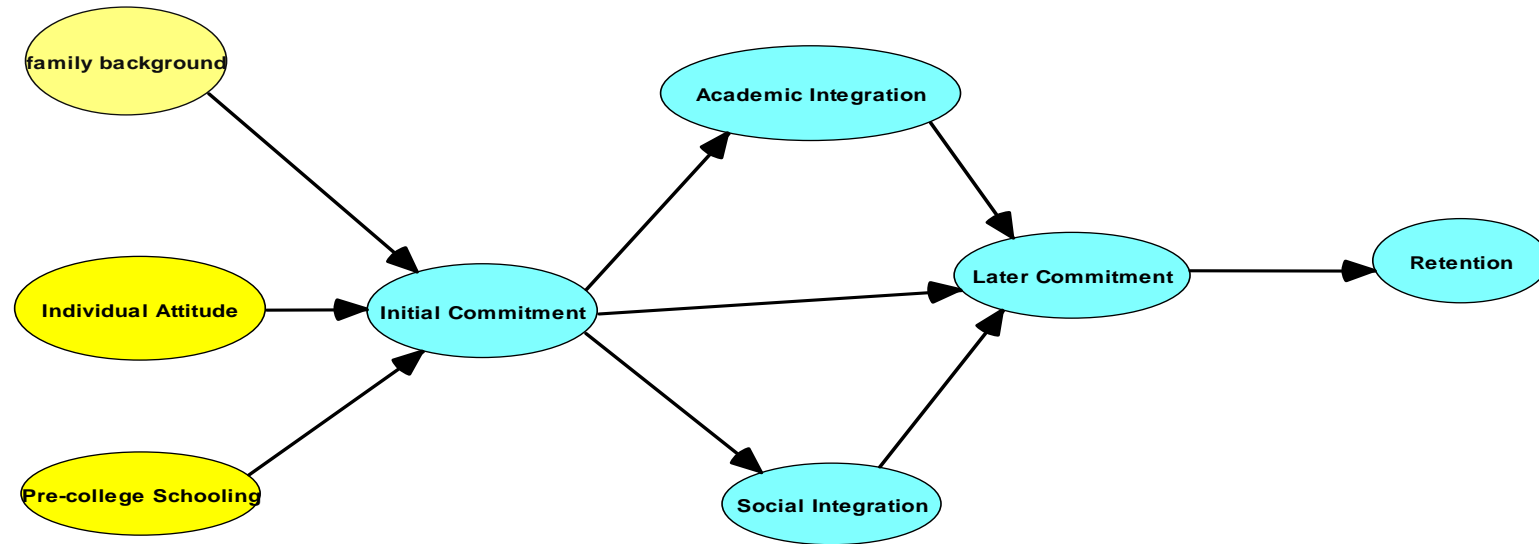


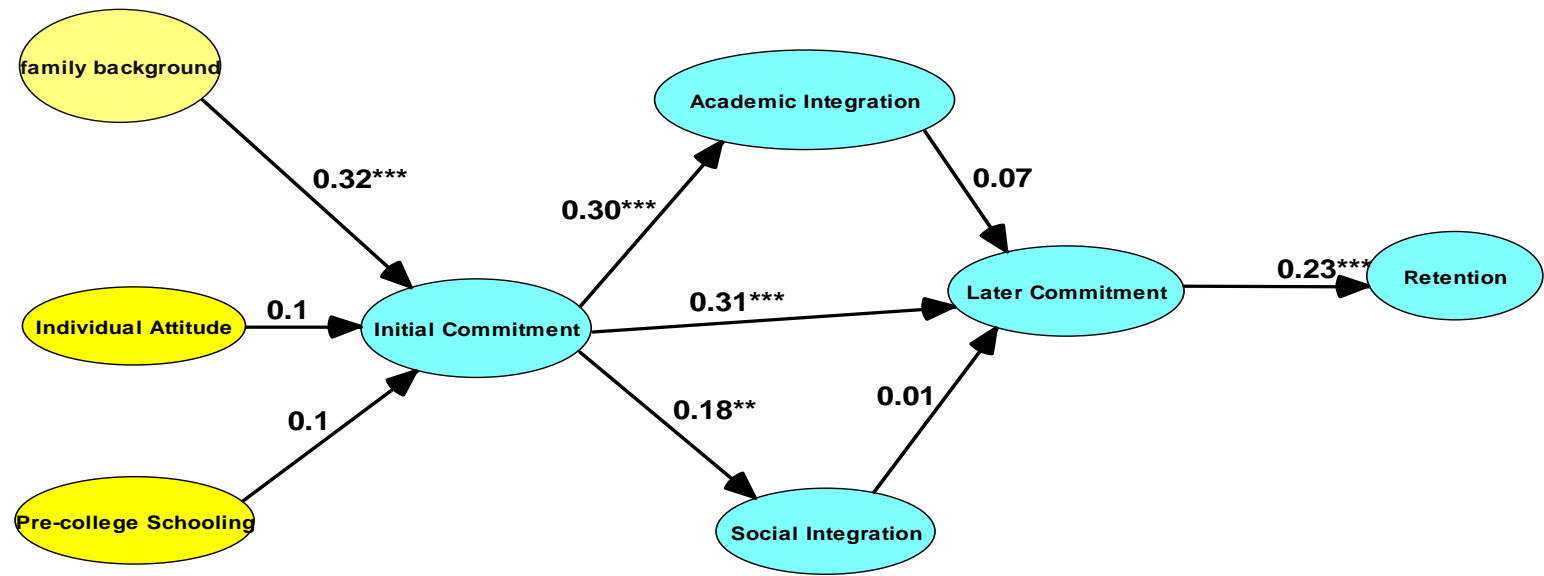
Figure 4.4 A Path Diagram for the Initial Theoretical Model

paths (Individual Attitude → Initial Commitment, Pre-College Schooling → Initial Commitment, Social Integration → Later Commitment, and Academic Integration → Later Commitment) were not significant.

The theoretical structural model explained 12 percent of the variance in initial commitments, 9 percent of the variance in Academic integration, 3 percent of the variance in Social Integration, 12 percent of the variance in later commitments, and 5 percent of the variance in Retention.

In order to achieve a better model fit the Modification Index (MI) suggested the model could be improved by adding several structural paths. However, it is important to note that structural equation modelling should be theory driven, and modifications should be made with theoretical grounding. Jöreskog and Sörbom (1993) suggest that a path with the large modification index should be estimated and modification should be made in step. The largest MI (67.14) is represented by a path from Initial Commitment to Retention. This implies that students' initial commitment had a direct effect on their retention. Munro (1981) also found a significant direct effect for commitment on retention for first-time, full-time university students. Therefore, the first modified structural model was developed by adding one path from Initial commitment to Retention.

The results of the first modified structure model indicated that the chi-square of 518.03 with 219 degree of freedom was statistically significant at $p < 0.05$, indicating an inappropriate fit. Other fit statistics were within the acceptable values except for GFI, AGFI and CFI which was slightly



Note: * Significant at $p < .05$, ** significant at $p < .01$, *** significant at $p < .001$.

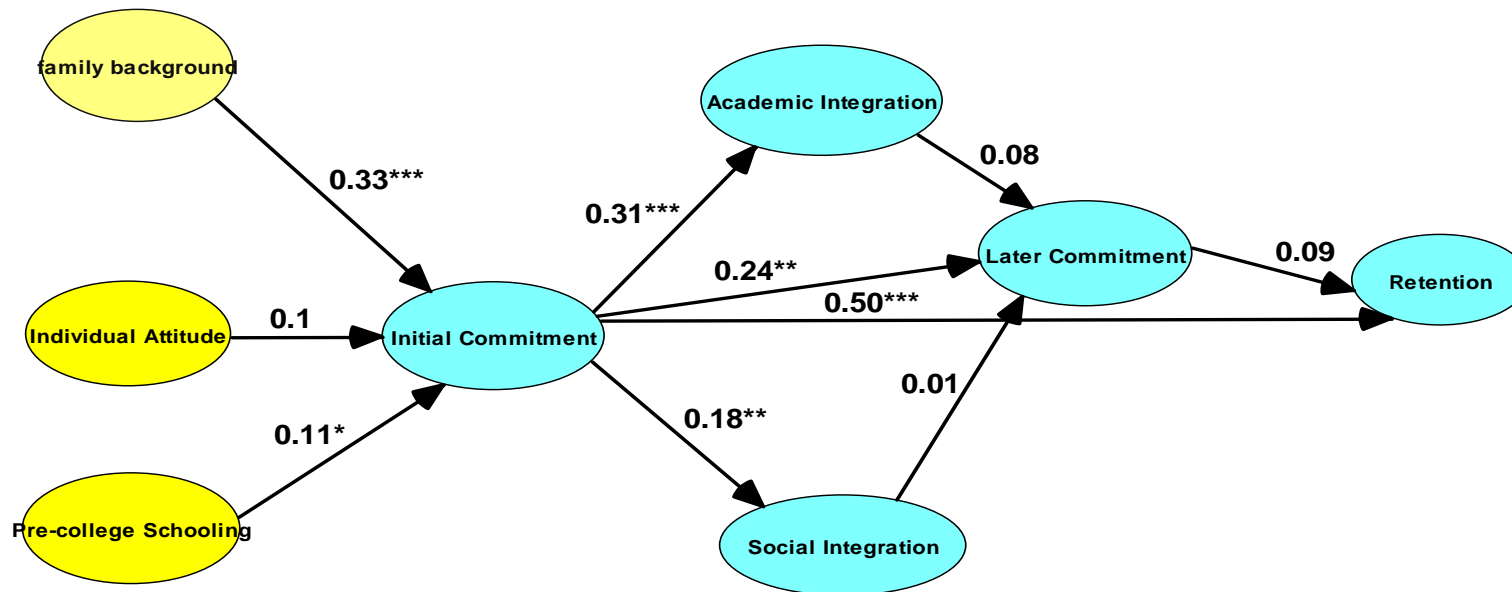
Figure 4.5 A Path Diagram for the Initial Theoretical Model

lower than the commonly acceptable values of 0.90 ($\chi^2/df = 2.37$; GFI= 0.89; AGFI=0.87; CFI=0.86; RMSEA =0.06). Overall, the fit statistics indicated a moderate fit between the data and the theoretical model. The standardized path coefficients for the first modified structural model are presented in Figure 4.6.

In a review of the MI, it was found that the model could also have a better fit if more paths were added. The largest MI (76.84) is represented by a path from Social integration to Academic integration. This implies that students' social integration had a direct effect on their academic integration. The effect of social integration on academic integration was consistent with prior results obtained by Williamson and Creamer (1988), and Stage (1989). Therefore, the second modified structural model was developed by adding one path from Social Integration to Academic Integration.

The results of the second modified structural model indicated that although the chi-square of 426.08 with 218 degree of freedom was statistically significant at $p < 0.05$, all other fit statistics were within acceptable values except for AGFI ($\chi^2/df = 1.95$; GFI= 0.91; AGFI=0.88; CFI=0.90; RMSEA =0.05). This indicated a good fit between the data and the second modified structural model. The standardized path coefficients for the second modified structural model are presented in Figure 4.7.

In a review of the MI, it was found that the model could also have a better fit if more paths were added. The largest MI (4.91) is represented by a path from Pre-college schooling to Retention. This implies that students' high school



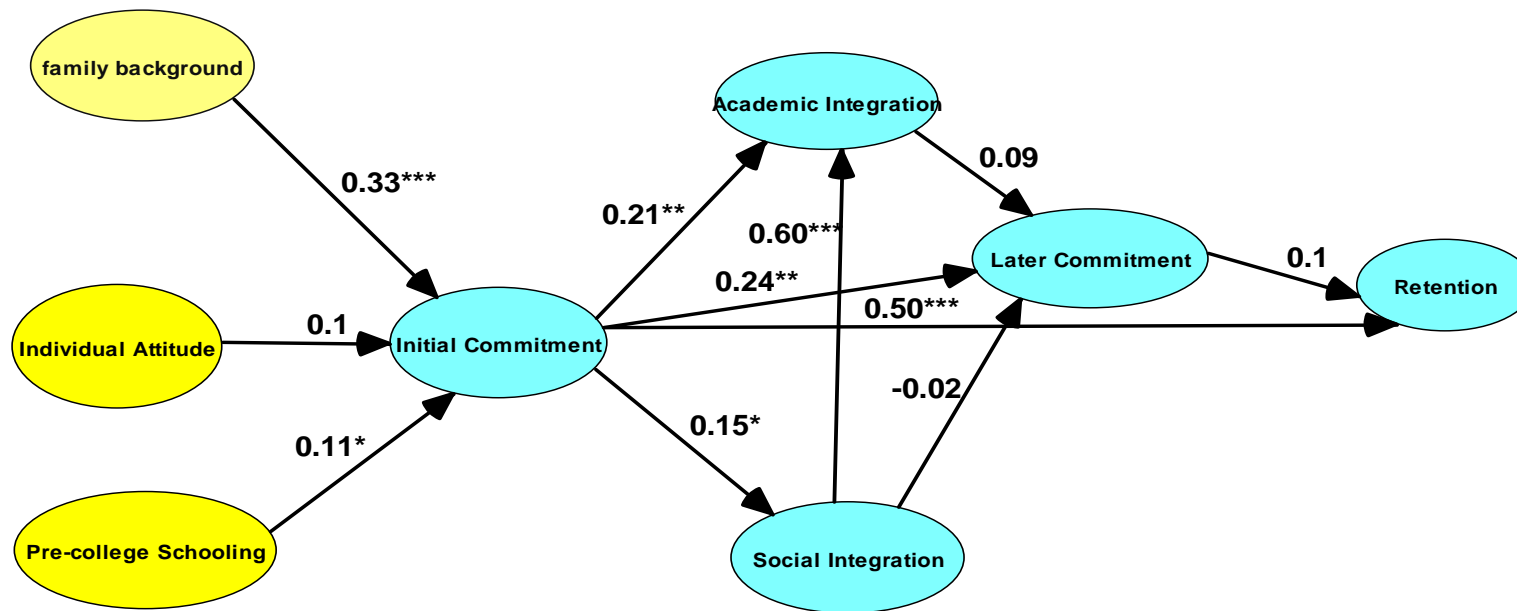
Note: * Significant at $p < .05$, ** significant at $p < .01$, *** significant at $p < .001$.

Figure 4.6 A Path diagram for the First modified Model

results had a direct effect on their retention. The effect of high school results on retention was consistent with prior results obtained by Bray, Braxton, and Sullivan (1999), Pascarella and Chapman (1983a, 1983b) and Bean (1982b). Therefore, the third modified structural model was developed by adding one path from Pre-College Schooling to Retention.

The results of the third modified structural model indicated that although the chi-square of 420.93 with 217 degree of freedom was statistically significant at $p < 0.05$, all other fit statistics were within acceptable values ($\chi^2/df = 1.93$; GFI = 0.91; AGFI = 0.90; CFI = 0.91; RMSEA = 0.04). This indicated a good fit between the data and the second modified structural model. This model was considered to be the final model because the MI did not suggest adding any more paths.

The standardized path coefficients for the third modified structural model are presented in Figure 4.8. Eight of the twelve hypothesized paths were at least significant at $p < 0.05$. The eight significant paths were family background → Initial Commitment, Initial Commitment → Academic Integration, Initial Commitment → Social Integration, Pre-College Schooling → Retention, Initial commitment → Later Commitment, Initial Commitment → Retention, Social Integration → Academic Integration, and from Later Commitment → Retention. The other four hypothesized paths (Individual Attitude → Initial Commitment, Pre-College Schooling → Initial Commitment, Social Integration → Later Commitment, and Academic Integration → Later Commitment) were not significant.



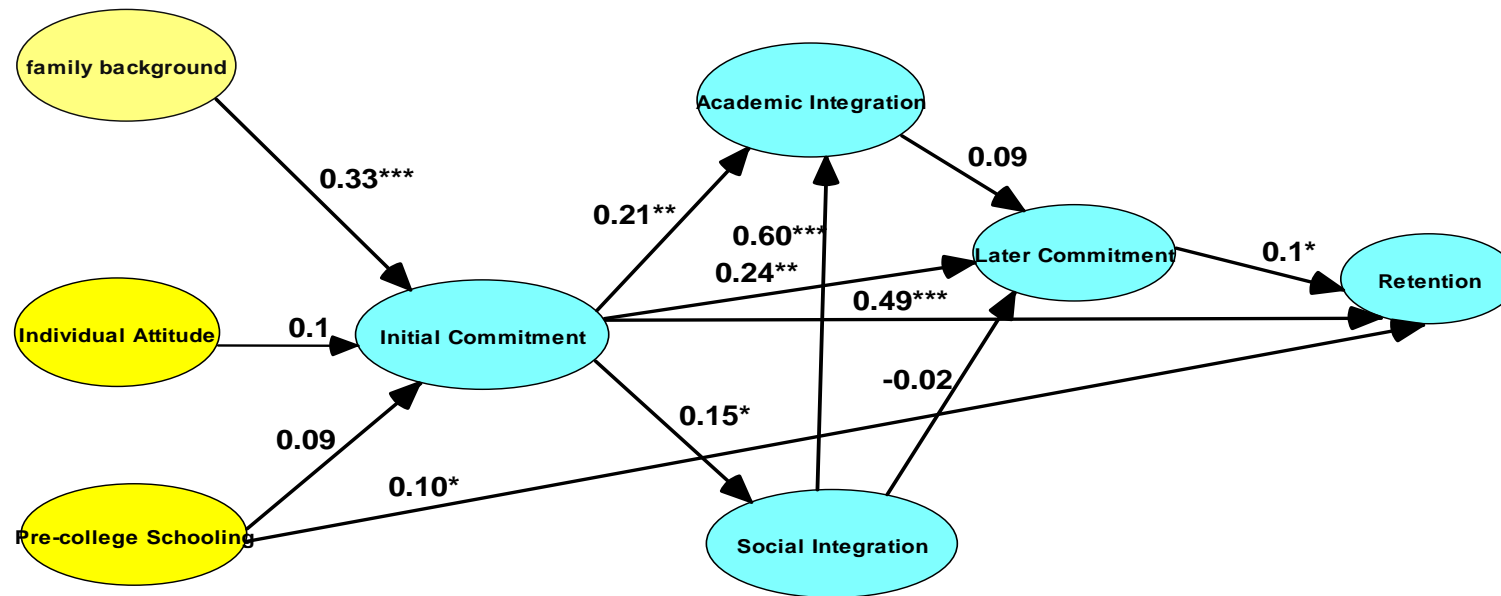
Note: * Significant at $p < .05$, ** significant at $p < .01$, *** significant at $p < .001$.

Figure 4.7 A Path diagram for the Second Modified Model

The third modified structural model explained 13 percent of the variance in initial commitments, 42 percent of the variance in Academic integration, 2 percent of the variance in Social Integration, 8 percent of the variance in later commitments, and 30 percent of the variance in Retention.

The above results show only the direct effects of one latent variable on another as proposed by the model. The SEM also shows the indirect effects. The direct effects are the influences of one variable on another that are not mediated by any other variable and the indirect effects are those that are mediated by at least one variable. The total effects are the sum of the direct and indirect effects. Table 4.11 presents the indirect, direct, and total effects of each latent variable.

The results indicated that students' retention received indirect effects from family background, pre-college schooling, and individual attitude through both initial and later commitment, academic integration, and social integration. Students' retention also received an indirect effect from initial commitment through academic integration, social integration, and later commitments. Both social and academic integration had no indirect effects on students' retention.



Note: * Significant at $p < .05$, ** significant at $p < .01$, *** significant at $p < .001$.

Figure 4.8 A Path Diagram for the Third and Final Modified Model

Table 4.11 Total, Indirect, and Direct Effects among Latent Variables

	<i>Initial Goal and Institutional Commitments</i>			<i>Social Integration</i>			<i>Academic Integration</i>			<i>Later Goal and Institutional Commitment</i>			<i>Retention</i>		
	DE	IE	TE	DE	IE	TE	DE	IE	TE	DE	IE	TE	DE	IE	TE
<i>Family Background</i>	.3302	-	.3302	-	.0480	.0480	-	.0964	.0964	-	.0865	.0865	-	.1701	.1701
<i>Pre-College Schooling</i>	.0942	-	.0942	-	.0137	.0137	-	.0275	.0275	-	.0247	.0247	.1027	.0485	.1512
<i>Individual attitude</i>	.1000	-	.1000	-	.0146	.0146	-	.0292	.0292	-	.0262	.0262	-	.0515	.0515
<i>Initial Goal and Institutional Commitment</i>	-	-	-	.1454	-	.1454	.2050	.0869	.2919	.2389	.0230	.2620	.4883	.0268	.5151
<i>Social Integration</i>	-	-	-	-	-	-	.5977	-	.5977	-	.0520	.0359	-	.0037	.0037
<i>Academic Integration</i>	-	-	-	-	-	-	-	-	-	.0161	.0870	-	.0870	-	.0089
<i>Later Goal and Institutional Commitment</i>	-	-	-	-	-	-	-	-	-	-	-	-	.1023	-	.1023

Note: DE= Direct Effect, IE= Indirect Effect, TE= Total Effect

4.5.2 Hypotheses testing

The final step in the data analysis was to test all the hypotheses. The hypotheses were tested by assessing statistical significance of the path coefficients with t-values. The results of the hypotheses testing are presented in Table 4.12. The results indicated that five of the nine hypotheses were statistically significant. These paths were from family background to initial commitments, initial commitment to later commitment, initial commitments to academic integration, initial commitments to social integration, and from later commitments to retention. Four paths were not significant. These were from pre-college schooling to initial commitments, attitude to initial commitments, academic integration to later commitments and from social integration to later commitment.

Hypothesis 1: students' family background will be positively related to their initial goal and institutional commitments.

Hypothesis 1 tested the relationship between student's family background and their initial institutional and goal commitments. Since the standardized path coefficient of 0.33 and the t-value of 4.02 were significant, the hypothesis was supported by the data.

Hypothesis 2: students' pre-college schooling will be positively related to their initial goal and institutional commitments.

Hypothesis 2 tested the relationship between students' pre-college schooling and their initial institutional and goal commitments. The standardized path coefficient of .09 and the t-value of 1.73 were not significant. Therefore, the results did not support the hypothesis.

Hypothesis 3: students' attitude will be positively related to their initial goal and institutional commitments.

Hypothesis 3 tested the relationship between students' attitude and their initial institutional and goal commitments. As indicated by the standardized path coefficient of .10 and the t-value of 1.86, which were not significant, the hypothesis was not supported by the data.

Hypothesis 4: students' initial goal and institutional commitments will be positively related to their later goal and institutional commitments.

Hypothesis 4 tested the relationship between students' initial institutional and goal commitments and their later institutional and goal commitment. The standardized path coefficient of 0.24 and the t-value of 3.27 were significant. Therefore, students' initial institutional and goal commitment

has a significantly positive direct effect on later institutional and goal commitment.

Hypothesis 5: students' initial goal and institutional commitments will be positively related to their academic integration.

Hypothesis 5 tested the relationship between students' initial institutional and goal commitments and their academic integration. The standardized path coefficient of 0.21 and the t-value of 3.23 were significant. Therefore, students' initial institutional and goal commitment has a significantly positive direct effect on their academic integration.

Hypothesis 6: students' initial goal and institutional commitments will be positively related to their social integration.

Hypothesis 6 tested the relationship between students' initial institutional and goal commitments and their social integration. The standardized path coefficient of 0.15 and the t-value of 2.26 were significant. Therefore, students' initial institutional and goal commitment has a significantly positive direct effect on their social integration.

Hypothesis 7: students' academic integration will be positively related to their subsequent goal and institutional commitments.

Hypothesis 7 tested the relationship between students' academic integration and their later institutional and goal commitments. The standardized path coefficient of .09 and the t-value of 0.884 were not significant. Therefore, the results did not support the hypothesis.

Hypothesis 8: students' social integration will be positively related to their subsequent goal and institutional commitments.

Hypothesis 8 tested the relationship between students' social integration and their later institutional and goal commitments. The standardized path coefficient of -0.02 and the t-value of -0.1805 were not significant. Therefore, the results did not support the hypothesis.

Hypothesis 9: students' subsequent goal and institutional commitments will be positively related to their retention status.

Hypothesis 9 tested the relationship between students' later institutional and goal commitments and their retention status. The standardized path coefficient of 0.10 and the t-value of 1.97 were significant. Therefore, students' later institutional and goal commitment has a significantly positive direct effect on their retention status.

Additional findings (other results)

SEM produced other significant results. First, the path from initial commitments to retention suggests a significant positive relationship (0.49, t-value 7.83). Second, the path from social integration to academic integration suggests a significant positive relationship (0.60, t-value 5.73). Third, the path from pre-college schooling to retention suggests a significant positive relationship (0.10, t-value 2.29)

Table 4.12 Summary of Hypotheses Testing

	<i>Hypothesis</i>	β (<i>t-value</i>)	<i>Results</i>
H1	Students' family background will be positively related to their initial goal and institutional commitments.	0.33 (4.02)	Supported
H2	Students' pre-college schooling will be positively related to their initial goal and institutional commitments.	0.09 (1.73)	Not Supported
H3	Students' attitude will be positively related to their initial goal and institutional commitments.	0.10 (1.86)	Not Supported
H4	Students' initial goal and institutional commitments will be positively related to their later goal and institutional commitments.	0.24 (3.27)	Supported
H5	Students' initial goal and institutional commitments will be positively related to their academic integration.	0.21 (3.23)	Supported
H6	Students' initial goal and institutional commitments will be positively related to their social integration.	0.15 (2.26)	Supported
H7	Students' academic integration will be positively related to their subsequent goal and institutional commitments.	0.09 (0.884)	Not Supported
H8	Students' social integration will be positively related to their subsequent goal and institutional commitments.	-0.02(- 0.1805)	Not Supported
H9	Students' subsequent goal and institutional commitments will be positively related to their retention status.	0.10 (1.97)	Supported

4.6 Conclusion

This chapter presented the results of the quantitative data analysis. The data were compared to the population and then were screened and cleaned in terms of missing values, outliers, normality, and sample size requirement for SEM.

Confirmatory factor analysis was conducted to test the fit of the measurement model. Reliability and validity of each latent variable were examined. The procedure conducted in developing the modified final structural model was explained. The results indicated that the final structural model explained 30 percent of the variation in retention. The SEM was used to test the hypotheses. From the twelve hypotheses, eight were supported including the additional paths emerged from the analyses.

Chapter 5 - Qualitative Data Analysis

5.1 Introduction

This chapter presents the results of the qualitative data analysis. It is divided into three sections. The first section provides the characteristics of the participants; the second identifies the factors affecting student retention as perceived by non-persister students, persister students, and staff members; and, the final section compares Tinto's constructs or factors between both non-persister and persister students.

5.2 Participants characteristics

As outlined in the methodology chapter, qualitative data were gathered from three sources: non-persister students, persister students, and staff members, in an attempt to determine the factor affecting student retention at KSU. Seventeen non-persister students were interviewed over the phone. The demographic characteristics of non-persister students are presented in Table 5.1. The non-persister students' ages ranged from 19 to 22 with a mean of 19.76 years. Their high school results ranged from 84.22 to 93.34 with a mean of 88.57 per cent. General reasoning test results ranged from 59.00 to 80.00 percent with a mean of 69.64 per cent. In relation to the major taken, two students studied at the Education College, three at the Agriculture College, three at the Sciences College, four at the Administrative Sciences College, three at the Art College, and two at the Language and Translation College.

Table 5.1 Non-Persister Students' Demographic Characteristics

<i>Participant</i>	<i>Major</i>	<i>High school scores</i>	<i>Parent education</i>	<i>general reasoning test scores</i>	<i>Age</i>
<i>NP 1</i>	Education	85.09	Mother/primary school father/secondary school	67.00	20
<i>NP 2</i>	Language and translation	88.61	Mother/ primary school father/ primary school	59.00	19
<i>NP 3</i>	Administrative Sciences	93.34	Mother/ high school father/ high school	75.00	19
<i>NP 4</i>	Art	88.00	Mother/ secondary school father/ secondary school	63.00	21
<i>NP 5</i>	Agriculture	84.22	Mother/high school father/ master degree	69.00	20
<i>NP 6</i>	Language and translation	84.47	Mother/ high school father/ high school	69.00	19
<i>NP 7</i>	Administrative Sciences	89.76	Mother/ primary school father/secondary school	76.00	19
<i>NP 8</i>	Administrative Sciences	93.03	Mother/ high school father/primary school	72.00	22
<i>NP 9</i>	Administrative Sciences	88.11	Mother/ secondary school father/ primary school	74.00	19
<i>NP 10</i>	Agriculture	88.50	Mother/primary school father/high school	64.00	19
<i>NP 11</i>	Art	85.00	Mother/ secondary school father/high school	80.00	20
<i>NP 12</i>	Science	92.50	Mother/ secondary school father/high school	72.00	20
<i>NP 13</i>	Science	87.06	Mother/primary school father/high school	74.00	19
<i>NP 14</i>	Art	89.56	Mother/primary school father/secondary school	70.00	22
<i>NP 15</i>	Science	89.56	Mother/ primary school father/ secondary school	70.00	19
<i>NP 16</i>	Education	91.50	Mother/ high school father/ primary school	65.00	20
<i>NP 17</i>	Agriculture	87.50	Mother/ secondary school father/ secondary school	65.00	19

Note: NP1= Non-Persister Student 1

Persister students were interviewed using focus group techniques. Three focus groups were undertaken with between four to six students in each. A total of 15 persister students were involved. The first group consisted of six students from the Education College; the second group consisted of five students from the Languages and Translation College; and, the third group consisted of four students from the Sciences College. The demographic characteristics of persister students are presented in Table 5.2. The students' ages ranged from 18 to 21 with a mean of 19.53 years; high school results ranged from 81.82 to 98.56 with a mean of 90.68 per cent; and, general reasoning test results ranged from 61.00 to 83.00 per cent; with a mean of 71.13 percent. Their university GPA ranged from 1.33 to 4.69 with a mean of 2.79 points.

Staff members were asked to complete a staff survey. Of the 200 surveys sent, 37 were returned and completed by sixteen lecturers, twelve administrators, five librarians, and four counsellors.

Comparisons between non-persister and persister students and the total freshman population with regard to high school performance and general reasoning test scores are shown in Table 5.3. The t-test results indicated that the two groups were representative of the total population from which they were drawn, with respect to general reasoning test scores. Regarding the high school performance, the t-test results indicated that the non-persister students were representative of the total populations whereas persister students had slightly higher high school test scores than the population.

Table 5.2 Persister Students' Demographic Characteristics

<i>Focus Group</i>	<i>Age</i>	<i>Major</i>	<i>HSS</i>	<i>general reasoning</i>	<i>GPA</i>	<i>Parent Education</i>
<i>P 1.1</i>	19	Education	90.50	61.00	1.39	Mother/ primary school father/ high school
<i>P 1.2</i>	19	Education	83.21	70.00	1.33	Mother/ secondary school father/ secondary school
<i>P 1.3</i>	20	Education	91.38	64.00	2.00	Mother/ high school father/ secondary school
<i>P 1.4</i>	21	Education	94.00	76.00	2.63	Mother/ secondary school father/ secondary school
<i>P 1.5</i>	19	Education	91.65	72.00	4.23	Mother/ high school father/ high school
<i>P 1.6</i>	19	Education	89.18	73.00	2.38	Mother/ high school father/ high school
<i>P 2.1</i>	20	Language & Translation	85.33	64.00	1.43	Mother/ secondary school father/ secondary school
<i>P 2.2</i>	19	Language & Translation	91.50	60.00	2.35	Mother/ high school father/ high school
<i>P 2.3</i>	21	Language & Translation	90.18	65.00	3.46	Mother/ high school father/ high school
<i>P 2.4</i>	21	Language & Translation	81.82	74.00	3.48	Mother/ primary school father/ secondary school
<i>P 2.5</i>	19	Language & Translation	95.18	80.00	2.43	Mother/ secondary school father/ primary school
<i>P 3.1</i>	19	Science	95.06	83.00	4.69	Mother/ secondary school father/ PhD degree
<i>P 3.2</i>	18	Science	93.64	71.00	3.42	Mother/ high school father/ PhD degree
<i>P 3.3</i>	20	Science	98.56	79.00	4.21	Mother/ high school father/ high school
<i>P 3.4</i>	19	Science	89.06	75.00	2.46	Mother/ high school father/ high school

Note: P 1.1 = Persister student 1 in Focus Group 1.

Table 5.3 Comparisons between the Participants and the Population

			<i>Population</i> <i>N=7035</i>	<i>p</i>
<i>Non-persister</i> <i>N=17</i>	High school test scores	88.58	86.98	NS* (0.037)
	General Reasoning test scores	69.65	70.61	NS**(0.473)
<i>Persister</i> <i>N=15</i>	High school test scores	90.68	86.98	(0.007)
	General Reasoning test scores	71.13	70.61	NS**(0.779)

* $P > 0.01$, ** $P > 0.10$

5.3 Factors affecting student retention as perceived by non-persister, persister students, and staffs

This section examines the factors affecting student retention as perceived from three perspectives outlined in Section 5.1: non-persister students, persister students, and the staff members.

5.3.1 Non-persister students

Non-persister students were asked to indicate the factors affecting their retention at King Saud University. There were 33 statements in the transcripts coded as variables serving to affect student retention. Variables were coded and counted as affecting retention if participants' indicated that the variable was important in their decisions to leave KSU. As many of these variables were similar and because a participant cited some variables more than once, these variables were further reduced to ten categories or factors. Table 5.4 shows a visual description of the factors and their frequencies.

Table 5.4 Variables perceived from non-persister students to affect student retention at KSU with frequency and percent of sample

	<i>Factors</i>	<i>Counts</i>	<i>Frequency</i>
<i>1</i>	Difficulties in selecting their desired major	13	77 %
<i>2</i>	Difficulties transferring to another college or department	7	41 %
<i>3</i>	Distance from university	3	18 %
<i>4</i>	Irregularity of student monthly reward	2	12 %
<i>5</i>	Difficulties finding a job after graduating and their majors have no career path	2	12 %
<i>6</i>	Un-preparedness for living away from home	2	12 %
<i>7</i>	Lack of advice and guidance	1	6 %
<i>8</i>	Getting admitted to another university or finding job	1	6 %
<i>9</i>	Financial problems	1	6 %
<i>10</i>	Difficulties adjusting to university climate and a lack of knowledge of the university system	1	6 %
	Total	33	

Table 5.4 reveals that participants in the study experienced: difficulties in selecting their desired major (77%), difficulties transferring to another college or department (41%), distance from university (18%), irregularity of student monthly reward (12%), difficulties finding a job after graduating and their majors having no career path (12%), un-preparedness for living away from home (12%), lack of advice and guidance (6%), getting admitted to another university or finding job (6%), financial problems (6%), and difficulties adjusting to university climate and a lack of knowledge of the university system (6%) all serve to affect their retention at KSU.

These results suggest that the most important variables affecting student retention as perceived from non-persister students are difficulty in selecting a desired major and of transferring to another college or department.

5.3.2 Persister students

Persister students were asked to indicate the factors affecting their retention at King Saud University. There were 48 statements in the transcripts coded as variables serving to affect student retention. Variables were coded and counted as affecting retention if participants' indicated that the variable was important in affecting their retention at KSU. As with non-persister students many of these variables were similar and because a participant cited some variables more than once, these variables were further reduced to fourteen categories or factors. Table 5.5 shows a visual description of the factors and their frequencies.

Table 5.5 Variables perceived from persister student to affect student retention at KSU with frequency and percent of sample

	<i>Factors</i>	<i>Counts</i>	<i>Frequency</i>
<i>1</i>	Difficulties in selecting their desired major	7	47 %
<i>2</i>	Difficulties transferring to another colleges or departments	6	40 %
<i>3</i>	Irregularity of student monthly reward	4	27 %
<i>4</i>	Difficulties adjusting to university climate and a lack of knowledge of the university system	4	27 %
<i>5</i>	Lack of relation with staff	4	27 %
<i>6</i>	Admitted to another university or finding job	4	27 %
<i>7</i>	Distance from university	3	20 %
<i>8</i>	Lack of advice and guidance	3	20 %
<i>9</i>	Lack of motivation	2	14 %
<i>10</i>	Difficulties finding a job after graduating and their majors have no career path	2	14 %
<i>11</i>	Getting financial problems	2	14 %
<i>12</i>	Un-preparedness for living away from home	2	14 %
	Total	48	

Table 5.5 reveals that participants in the study felt that: difficulties in selecting their desired major (47 %), difficulties transferring to another colleges or departments (40 %), irregularity of student monthly reward (27

%), difficulties adjusting to university climate and a lack of knowledge of the university system (27 %), lack of relation with staff (27 %), admitted to another university or finding job (27 %), distance from university (20 %), lack of advice and guidance (20 %), lack of motivation (14 %), difficulties finding a job after graduating and their majors having no career path (14 %), getting financial problems (14 %), and un-preparedness for living away from home (14 %) all serve to affect their retention at KSU.

These results also suggest that the most important variables affecting student retention as perceived from persister students are difficulty in selecting a desired major and of transferring to another college or department.

5.3.3 Staff members

Staff members were asked to indicate their perceptions of the factors affecting student retention at King Saud University. There were 94 statements in the transcripts coded as variables serving to affect student retention. As many of these variables were similar and because a participant cited some variables more than once, these variables were further reduced to fourteen categories or factors. Table 5.6 shows a visual description of the factors and their frequencies.

Table 5.6 Variables perceived from staff members to affect student retention at KSU with frequency and percent of sample

	<i>Factor</i>	<i>Count</i>	<i>Frequency</i>
<i>1</i>	Lack of motivation	15	41 %
<i>2</i>	Difficulties in selecting their desired major	14	38 %
<i>3</i>	Difficulties adjusting to university climate and a lack of knowledge of the university system	8	21 %
<i>4</i>	Getting admitted to another university or finding job	7	19 %
<i>5</i>	Lack of relation with staff	6	16 %
<i>6</i>	Difficulties finding a job after graduating and their majors have no career path	5	14 %
<i>7</i>	Un-preparedness for living away from home	5	14 %
<i>8</i>	Low prior educational preparedness	5	14 %
<i>9</i>	Family problems	5	14 %
<i>10</i>	Low grade point average	4	11 %
<i>11</i>	Difficulties transferring to another colleges or departments	3	8 %
<i>12</i>	Lack of advice and guidance	3	8 %
<i>13</i>	Getting financial problems	3	8 %
<i>14</i>	Irregularity of student monthly reward	2	6 %
	Total	94	

Table 5.6 reveals that participants in the study felt that: lack of motivation (41 %), difficulties in selecting their desired majors (38 %), difficulties adjusting to university climate and a lack of knowledge of the university system (21 %), getting admitted to another university or finding job (19 %), lack of relation with staff (16 %), difficulties finding a job after graduating and their majors having no career path (14 %), un-preparedness for living away from home (14 %), low prior educational preparedness (14 %), family problems (14 %), low grade point average (11 %), difficulties transferring to another colleges or departments (8 %), lack of advice and guidance (8 %), getting financial problems (8 %), and irregularity of student monthly reward (6 %), all serve to affect student retention at KSU.

These results also suggest that the most important variables affecting student retention as perceived from staff members are lack of student motivation and difficulty of students' in selecting their desired majors.

5.4 Examining Tinto's constructs from both non-persister and persister students

In this section, a comparison of Tinto's constructs or factors affecting student retention between non-persister and persister students is undertaken. These factors are background characteristics, goal and institutional commitments, academic integration, and social integration.

5.4.1 Background characteristics

Tinto's student integration model postulates that students enter a university with a range of background characteristics. These include family backgrounds, individual attitudes, and pre-college schooling. Family background was measured by the levels of students' parent formal education; individual attitude by students' general reasoning test scores; and, Pre-college schooling by the students' high school test scores.

The background characteristics of both non-persister and persister students are presented in Tables 5.1 and 5.2. High school results of non-persister students ranged from 84.22 to 93.34 with a mean of 88.57 per cent. For persister students, their high school results ranged from 81.82 to 98.56 with a mean of 90.68 per cent. The percentages of non-persister and persister students who obtained in the high school test score of 90

percent or higher were 23 % (4 students) and 67 % (10 students), respectively.

The general reasoning test scores of non-persister students ranged from 59.00 to 80.00 with a mean of 69.64 per cent. For persister students, their scores ranged from 61.00 to 83.00 with a mean of 71.13 per cent.

The percentages of non-persister and persister students who had at least one parent obtaining high school degree or higher were about 18 % (3 students) and 67 % (10 students), respectively.

The results suggest that there were clear differences between non-persister and persister students in terms of their parent formal education level and high school results. Regarding their general reasoning test results, there was no clear difference between them.

5.4.2 Initial Goal and Institutional Commitments

Goal commitment represents the degree to which the student is committed, or motivated, to get a university degree in general. Students were asked about their main educational goal when they enrolled at KSU. The majority of non-persister students mentioned that their main educational goal was to obtain a bachelor degree. Two non-persister students mentioned that their goal was to get a job. On the other hand, the majority of persister students mentioned that their educational goal was to obtain more than a bachelor degree.

Institutional commitment represents the degree to which the student is motivated to graduate from a specific university or major. Students were asked why they choose KSU. Most of the non-persister and persister students had chosen KSU because it is one of the best universities in Saudi Arabia and it was close to their family home. In addition, students were asked why they had chosen their majors. All of the non-persister students, with the exception of two, said that they did not like their majors. They could not choose their desired majors because they did not obtain good enough results in the general reasoning test. The other two non-persister students said that they liked their major but they had left the university because their goal was to get a job. The following quotes illustrate the problem of not gaining acceptance to the student's desired major. In the case of the first two quotes, being accepted to a major that was not of their choosing contributed directly to the decision to withdraw from university.

I selected this university because it is the best university. But I decided to leave because I was admitted to a different major. My desire was to study science but I was admitted to the Education College.

I studied agriculture but it was not my first choice. My desire was to study Finance. I accepted agriculture in order to transfer to Finance in the second semester. But I could not get the required grade to transfer so I decided to leave KSU.

The next two quotes illustrate the role that scores achieved in high school and on the general reasoning tests play in assigning to majors which are different to that desired by the student and the difficulty in attempting to transfer to a different major.

Frankly, because of my results in the high school and ability test, the only major I could choose was Persian Language. I accepted it in order to transfer to another major like French or English languages. I did try to transfer to another major but I could not. Also, I believe studying Persian language will not help me to find a good job. So because of that, I decided to leave KSU.

Also, I did not like to study Russian language. It was not my desire. My desire was to study Special Education but because of my high school and ability test results I had to select Russian language. I did try to transfer but again because of my GPA, I could not do it.

The next three quotes could in fact be seen as positive in that despite withdrawing from King Saud University, the three students had achieved a personal positive outcome in that one had left to enter employment and the other two had achieved a transfer to another institution and another more favoured major.

Actually, I did apply to many places like universities and jobs. My main goal was to work rather than to study. Three weeks after applying to KSU, I got accepted for a job. So that I left the KSU to work

It was not my desire to study Arabic language. My desire was to study English. My scores from the high school test and ability test were 80% and the administrator told me I can only select Arabic language. So I did select this major in order to transfer to an English language major. I was not sure I would be able to transfer so that I also applied to Imam Mohammed (another university in Riyadh) and I was accepted to study English. So that I left KSU before the second semester and I will start my study at Imam University next semester.

I dropped out because I did not like to study history and I had applied to technical college and I got the admission. Some majors in KSU have no career future. If I was admitted to my desired major which

was Media and Communication, I would not have left KSU.

Conversely, nine of persister students said they had obtained their desired choice of major. Six students said that they were not able to select their desired major because they could not obtain good enough results in the general reasoning test.

We did not choose to study at the Language and Translation College. For me, my ambition was to study accounting.

Also for me I did not choose to study Persian Language, my desire was to study English language.

I did not like to study Persian Language. My desire was to study Special Education.

My desire was to study English language. I think studying Persian language will not help me to find a good job. We could not choose our desired majors because of the ability test scores.

However, two specifically stated their intention to try and transfer to their desired majors. Interestingly, they suggest that even if the transfer process is unsuccessful, they still intend to complete their studies. The final quote also provides more details of what the transfer process involves.

I am studying in the Education department. But I did not select it and it is not my desired choice. I did apply to the Administrative Sciences College to study business management. I will continue my studies even though I do not like it. Hopefully after finishing my degree, I will join one of the military colleges.

I got good results in high school test. I got 98%. I wanted to study in Education. I wanted to study in Special Education or at the Administrative Science College. But because I did not get a good result in the Ability Test, I did not get to select my desired major. Now I have been selected to study in

education. In fact, I will continue in this major. If I get the required grade for transferring, this is 2.5 out of 5. I will transfer to my desired majors either to the Special Education department or to any department at the Administrative Science College. If I do get less than 2.5, I will not drop-out but I will continue until graduating.

From the preceding quotes, it appears that persister students may be more motivated to study or had clearer and more defined educational goals than non-persister students. In addition, the majority of persister students had achieved entry to their desired majors unlike the non-persister students. This suggests that they had a greater degree of institutional commitment than non-persister students.

5.4.3 Academic Integration

Academic integration is defined as a student's perceived academic performance and intellectual development (Pascarella and Terenzini, 1980). Both groups of students were asked about how the induction week helped them to be settled in the university. All persister students said they did not attend it. Most of the students did not hear about the induction week. For example the first three quotes indicate that some students appear to have no knowledge of induction activities:

I did not hear of the induction week!

I did not attend the first week.

I attended the first week but I did not hear of the induction week. The first day I got only my class schedule.

One student indicated that while he had heard of induction, he did not have a clear idea of what it entailed:

I have heard of it and I think that it is about sport activity.

The final two students quoted suggested that they either thought it a waste of time; or that it was hosted too long after the start of term to be of any use:

I heard of the induction week but I did not attend it because it is waste of time.

I heard of the induction week but it was not in the first week. I think it was in the fourth week. So what is the point of attending it after knowing many things in university by chance?

Similarly, none of the non-persister students attended the induction week. Once again, for example, a number of students had no knowledge of induction or what it entailed. This suggests that there may be an issue with how information about the aims and objectives of induction are communicated to new students on entry to university.

There was no induction week ... teaching started from the second day.

Induction week! I do not know what do you mean... but I did not know about it

The following two quotes express some of the difficulties which can arise when students are not aware of induction processes and are left to fend for themselves at the start of their studies:

I did not hear about it ... the first day I got my schedule ... there was no induction week ... the first week was complete chaos...

I did not attend the first week ... I only got my schedule ... I usually asked my friends about where to find the library and lectures classes...

Both groups of students were asked if they had received any kind of information or booklet about the university and their study such as a “freshmen book” or student handbook on the first day. None of them received any kind of information although one persister student said he found a copy of the “freshmen book” by chance.

The following quotations from persister students illustrate a lack of knowledge and information:

I did not know about it ... and I have no idea where I can get this book.

I did not get it ... but I think the university should have given us this book and any guidance in the first week.

Non-persister student also made similar comments:

The only thing I got in the first day was my schedule. and I asked my friends to help me to know how to read it.

The following two quotes from persister students provide some recommendations on how they felt information such as that contained in the handbook could be communicated to them; and, also stress the importance of such information:

This book may be given to students in the first week.. but I did not get it ... and it is not my fault.. it should be put in the advertisements places or in the university newspaper... if the university provided us with Email service, we could communicate well with the university ... but we do not have Emails

I remembered in the first week there was chaos!! many students did not know where to go ... where is class ... Who is responsible for that ... where is the

guidance and advices from the university. University should give freshmen all the required help in the first week ...

Both groups of Students were asked if they had sought assistance from the academic advisor. None of the persister students knew who their academic advisor was, or what their role was. For example, the first quote illustrates quite clearly the lack of knowledge in relation to academic advisors:

I do not know who is the academic advisor in this college ... and how they can help me ... frankly, I do not know who is the advisor and I do not know where to find them!

The next quotes suggest that there are some students who believe that they should succeed or fail on their own although this is disputed:

I think the student is responsible for himself... the academic advisor cannot do any thing ... for example, we do not need to be guided to find the class number or any thing related to our study....

I do not agree with you... the student needs to be advised especially the freshmen... I am a freshman in this university and there are many things I need to know about the university and about my study....

I remembered in the first weeks I was looking for my class for about 45 minutes... sometimes I asked students to help me... but I agree with XXX that academic advisor can not help...

Finally, some details of issues which it is felt the academic advisor would be helpful in resolving are reported:

There are many things we do not know in the university.. we are in need of someone to guide us, but how I really do not know.. how can we know about the laws of the university and the activities and

there is no good way of communication.. for example, I did not know about the time to transfer from college to another college or from department to another department, so that I could not transfer because I was late...

Similarly, non-persister students were asked if they had sought help from the academic advisor before deciding to leave KSU. All of them said they did not ask for help from the academic advisor. The most cited reasons for not asking for help from the academic advisor were that most of the students did not know if there was an academic advisor in the university, where to find them, or what their role was. For example, the first three quotes report no knowledge of the advisor or where to find them, indeed, the final quote appears to express some anger at this lack of knowledge:

This is the first time I have heard of the academic advisor.

This is the first time I heard of them and I don't know where I might find them

I did not know there is an academic advisor at university. If there is an academic advisor, we should have been told about that.

The following quote reports a specific instance where contact with an academic advisor may have been helpful:

How can he help me? I had a problem about transferring to another college and I went to the registration office to help me but there was no help at all.

Finally, one student reported particular circumstances, especially in the early stages of study, where contact would have helped integrate the students:

When we came to University, they gave us the schedule. I mean that there is no one who can provide us with information about university, places in colleges, the systems of university and academic guidance.

Both groups of student complained about the lack of advice, support and assistance they received from KSU. One persister student stated quite specifically that:

Freshmen are not familiar with the university system. They are in need of all kinds of help to be successful but we did not get this help from this university.

One non-persister student got admitted to a private college. He compared the advice and assistance between KSU and his private college.

I left KSU and I got admitted in Industrial Yanba College. Thanks to Allah... KSU is a very big university... students got lost I mean I usually found it difficult to find lectures classes..there was no office to ask for help.. I mean there was no place to help freshmen to find a lecture class and anything else they need..but in Yanba College the advice and help were more than excellent even though it is only a college and does not belong to any university... I like to be a student in this college although I am away from my family.. for many reasons. First, the relationships between the staff members and student are excellent; the students' behaviour is good.. I find help everywhere on the notice board or through the email... but in KSU frankly there was no such kind of help or advice... I think KSU should have information offices in each building. Freshmen are not familiar with the university system. Even the schedule was not clear I mean the schedule has letters ABC and Numbers 1234 I did not know how to read it.. Believe me if there were good advice in KSU, I would not even think about leaving.

In general, it appears that both non-persister and persister students had low levels of academic integration in the university systems and were often unsure about how or where to access support.

5.4.4 Social Integration

Social integration is defined as the quality of a student's relationships with both the peer group and the faculty (Pascarella and Terenzini, 1980). Both groups of students were asked to describe their relationship with the staff members. All of the persister students complained about their relationship with staff members. However, it would appear that there is at least one member of staff who is supportive. For example,

I wish to get my PhD but I think it is very difficult because there is no help from the staff members in this university except Dr X.

We do not have a good relationship with the staff members except Dr. X. All students like and respect him because he treats us in a good way.. he treats us like an elder brother... he made us like his subject and the university as well... even though the time of his class is the last one in the day, most of the students attend and the absence is very low.

It is very formal and they treat us badly and without any respect. I only have a good relationship with one member of staff.

It would also appear that many students are wary of approaching staff, that a climate of 'them' and 'us' prevails and many suggest that this could be detrimental to them in the longer term:

Really the staff are not helpful. I will tell you what happened to a Russian student who has just learned the Arabic Language. He called the doctor "teacher"

then the doctor became angry and told the student I am not a teacher I am a Dr.

This is really silly. We as students must be very careful when dealing with the staff members otherwise we will be in a big problem.

We really asked the junior students about the staffs' behaviour. They said it is normal and you have seen nothing yet. If you want to know more about the staffs' behaviour, go to the students' website in the internet and you will be surprised!!

I mean the staff treated students without respect at all.... A doctor did not let some students attend the class because of their long hair... there is no rule in the university about this... there is no system to protect students from the doctors...

That is true.. go to the student website and read about Dr Y. You will see how he treated his students badly...there are many doctors like him.... A doctor asked a student to leave the class because of his way of sitting

Also, dealing with the staff is very difficult. I know a student removed from study due to using a mobile phone in a lecture.

The majority of them are not friendly. It is really difficult to have a good relationship with the staff.

Students should be protected from the staff members.

Indeed, one suggested that the nature of the relationship, or lack of it, between students and staff may contribute to student dropout:

I think the relationship between students and staff members is another reason that leads student to leave. if the relationship is strong, the students will be motivated to study and continue their studies.

Another suggested that a language barrier may exist in some instances:

Most of the staff do not understand us and we also do not understand them because of the language.

We can not speak Persian very well and the staff cannot speak Arabic. Therefore, the relationship is very formal.

Finally, a number of students commented on specific instances where staff display what could be termed at the very least idiosyncratic behaviour:

I remembered we had a class and the doctor did not come. We waited for him a long time.... He should tell us that he can not come or put a message in his office to say he is busy...

Also, we had a class and the doctor did not come. We stayed for 30 minutes and then left the class. Latterly, we had been told that the doctor came and he considered us absent. .. this is one of the problems with the staff... we as freshman student do not know how to complain. .. These kinds of behaviours are affecting our achievements.

Another doctor threw examination papers and the paper that lies outside the hall will fail and the rest are successful. This is ridiculous.

There are students that do not know how to deal with doctors. For example some students ... said to doctor that he has no syllabus and he does not know how to explain, therefore, the punishment affects all students and he swore that he will be difficult with this group.

Similarly, all the non-persister students complained about their relationship with the staff members. For example:

I did not have any relationship with any staff. I just attended classes and listened to the doctor.

The staff were not very helpful at all. They did not cooperate with students.

Students need help from the staff. Doctors did not take the time to talk to students. They treat students without respect.

Well, some of the staff were helpful and friendly but the majority of the staff were unhelpful. It was difficult to communicate with the staff. Their way of teaching and treating students were bad. They did not spend time with students after finishing their classes.

One student mentioned a particular situation that had caused tension between member of staff and students:

The most important thing KSU could do is to protect students from the staffs. For example, the rule in this university is that the time between 12-1 is prayer time. One doctor joined two classes in this time and one student told the doctor it is the time for praying ... the doctor was angry and asked the student not to attend the class.

Another, although commenting on problems interacting with staff, also mentioned student behaviour as contributing to their decision to withdraw:

The majority of the staff were not helpful. Also, students' behaviours was bad and this was one reason that made me to decide to leave. Students did not have strong ambitions to study. In other words, they were careless.

However, it could be that this is an instance of *post-hoc* rationalisation in relation to their decision to leave (Yorke, 1999).

It appears that there were no differences between persister and non-persister students in comments concerning their relationships with staff members. Both groups complained about their relationship with the staff members and in some instances provided evidence of particular situations in support of their comments.

Both groups of students were asked to indicate the types of social activities they had engaged in while attending KSU. All the persister students said they did not engage in any kind of social activities. When asked for the reasons why they did not engage in any form of social activity, they stated that they did not have the time to spend engaging in this activity and they did not know about these activities or how to join. For example,

No I do not have any kind of activity... after finishing my classes I go home...

Frankly, I didn't do any activity at KSU...

Similarly, all non-persister students except one said they had not engaged in any kind of social activity.

It appears that there was little difference between persister and non-persister students regarding the social activities they engaged in while at KSU. Both groups of students did not take part in social activities while attending KSU. In general, it appeared that both non-persister and persister students exhibited low levels of social integration in relation to university activities.

5.5 Conclusion

This chapter presented the results of the qualitative data analysis, utilising data gathered from three sources: non-persister students, persister students, and staff. The most important factors affecting student retention as perceived from the three sources were: difficulties in selecting a desired major and difficulties transferring to another college or department.

Moreover, a comparison between non-persister and persister students using Tinto's factors was carried out. The results suggested that persister students had better results in high school tests and their parents had more education than non-persister students. In addition, persister students were more motivated, and had more goal and institutional commitments than non-persister students. Regarding academic and social integration, the results suggested that both groups of students lacked any meaningful academic and social integration while at KSU.

Chapter 6 - Discussion

6.1 Introduction

The purpose of this study was to identify factors affecting student retention at King Saud University. The previous two chapters presented findings obtained utilising both quantitative and qualitative data. The purpose of this chapter is to integrate and discuss these findings and relate them to prior research.

6.2 Summary of the quantitative and qualitative results

As mentioned in chapter three, this study used a mixed methods approach. Using the terminology of Creswell (2003), the appropriate description of the overall design of this study is a mixed methods concurrent triangulation strategy. This means that 'qualitative and quantitative data are collected and analyzed at the same time. Priority is usually equal and given to both forms of data. Data analysis is usually separate, and integration usually occurs at the data interpretation stage' (Hanson *et al.*, 2005, p. 229). This strategy was selected because it allows the findings to be confirmed, cross-validated, and corroborated within a single study (Creswell, 2003).

The research consisted of two phases. The first phase utilised a quantitative approach. Quantitative data were collected from 414 freshman students using two questionnaires administered at two occasions and from

the university admission office. The quantitative data were analysed using a structural equation modelling (SEM) technique.

The results from the SEM indicated that the variables in the final model explained 13 percent of the variance in initial commitments, 37 percent of the variance in academic integration, 1 percent of the variance in social integration, 8 percent of the variance in later commitments, and 30 percent of the variance in student retention.

In addition, the results from the SEM indicated that four of the nine proposed hypotheses were supported by statistically significant results.

The four supported hypotheses were:

1. Students' family background was positively associated with their initial goal and institutional commitments.
2. Students' initial goal and institutional commitments were positively related to their later goal and institutional commitments.
3. Students' initial goal and institutional commitments had a significant positive direct effect on their levels of academic integration.
4. Students' later goal and institutional commitments had a significant positive direct effect on their retention status.

The other five unsupported hypotheses were:

1. Students' pre-college schooling was not related to their initial goal and institutional commitments.

2. Students' attitudes were not associated with their initial goal and institutional commitments.
3. Students' initial goal and institutional commitments did not predict their levels of social integration.
4. Students' academic integration did not predict their later goal and institutional commitments.
5. Students' social integration did not predict their later goal and institutional commitments.

Moreover, the results from SEM also produced other significant results that were not hypothesized. Three additional significant paths were found.

These were:

1. Students' initial goal and institutional commitments had a significant direct positive effect on student retention.
2. Students' pre-college schooling was a significant predictor of student retention.
3. Student's social integration was positively related to their academic integration.

The second phase of this study utilised a qualitative approach. Qualitative data were obtained from three sources: non-persister students, persister students, and staff members. 17 non-persister students were interviewed over the phone; fifteen persister students were interviewed using a focus

group technique; and staff members were asked to complete a survey. Of the 200 surveys distributed to members of university staff, 37 were returned. The composition of the returns featured responses completed by 16 lecturers, 12 administrators, 5 librarians, and 4 academic advisors.

Using Tinto's (1975) theory, persister and non-persister students were compared. In relation to students' levels of goal and institutional commitment, it was found that persister students appeared to be more motivated and to have higher levels of goal commitment than non-persister students. Similarly, persister students appeared to have higher levels of institutional commitment than non-persister students. In part this may be due to the fact that the majority of persister students had been able to select their desired majors whereas the majority of non-persister students had not.

In relation to the students' levels of academic integration, there was no significant difference between the two groups of students. Persister and non-persister students both exhibited low levels of academic integration into the university system. In addition, there was no significant difference between the two groups of students in terms of social integration. Both groups showed low levels of social integration into the university system.

The participants (persister students, non-persister students, and staff members) were all asked to indicate what they perceived to be the major factors affecting student retention at King Saud University. The major factors as perceived by non-persister students were:

- Difficulties of selecting desired major 77%
- Difficulties of transferring to another major 41%
- Distance from university 18%
- Irregularity of student monthly reward 12%
- Difficulties finding a job after graduating and their majors having no career path 12%
- Unprepared for living away from home 12%
- Lack of academic advice and guidance 6%
- Getting admitted to another university or finding job 6%
- Financial problems 6%
- Difficulties adjusting to university climate and a lack of knowledge of the university system 6%

The major factors as perceived by persister students were:

- Difficulties in selecting their desired major 47%
- Difficulties transferring to other colleges or departments 40%
- Irregularity of student monthly reward 27%

- Difficulties adjusting to university climate and a lack of knowledge of the university system 27%
- Lack of relationships with staff 27%
- Admitted to another university or finding job 27%
- Distance from university 20%
- Lack of academic advice and guidance 20%
- Lack of motivation 14%
- Difficulties finding a job after graduating and their majors having no career path 14%
- Getting financial problems 14%
- Un-preparedness for living away from home 14%

The major factors as perceived by staff members were:

- Lack of motivation 41%
- Difficulties in selecting their desired major 38%
- Difficulties adjusting to university climate and a lack of knowledge of the university system 21%
- Getting admitted to another university or finding job 19%

- Lack of relationships with staff 16%
- Difficulties finding a job after graduating and their majors having no career path 14%
- Un-preparedness for living away from home 14%
- Low prior educational preparedness 14%
- Family problems 14%
- Low grade point average 11%
- Difficulties transferring to another colleges or departments 8%
- Lack of academic advice and guidance 8%
- financial problems 8%
- Irregularity of student monthly reward 6%

6.3 Discussion of the findings

This study was guided by Tinto's (1975) theory of student integration. The results from quantitative and qualitative data indicated that Tinto's model was neither useful nor particularly helpful in explaining the student retention process at King Saud University because major constructs in the theory such as academic and social integration, did not differentiate between those who persisted and those who dropped out. In addition, the results from SEM indicated that Tinto's model explained only a small amount of the variance (30 per cent) in student retention. This finding is

consistent with previous studies conducted at residential institutions (e. g. Pascarella, Terenzini and Wolfle, 1986; Milem and Berger, 1997; Berger and Milem, 1999; Thomas, 2000).

Pascarella and Chapman (1983a) have suggested two possible explanations for the weak explanatory power of Tinto's theory. First, it might be a function of inadequate operational definition of the variables in the model. A second explanation might be that at least some important predictors of student retention may not be specified by the model. Another possible explanation is that Tinto's theory was developed to explain the student retention process in American higher education and there are many differences between the Saudi and American higher education systems. For example, education in Saudi Arabia is segregated by sex, tuition is free and in addition university students receive monthly financial aid from the government.

Tinto's theory depicted four different constructs or variable sets in a causal sequence: (1) background characteristics; (2) initial goal and institutional commitments; (3) academic and social integration; and, (4) later goal and institutional commitments. Thus, the discussions of the effects of these constructs on student retention process will follow the same order.

6.3.1 The effects of students background characteristics

Student background characteristics included family background, pre-college schooling and individual attributes (Tinto, 1993). It was hypothesized that student background characteristics would have a

positive and direct effect on their initial goal and institutional commitments. Goal commitment represents the degree to which the student is committed, or motivated, to get a university degree in general while institutional commitment represents the degree to which the student is motivated to graduate from a specific university. In this study, family background was measured by asking students about their parents' formal education. The results of the SEM indicated that family background was significantly associated with student's initial goal and institutional commitments. This indicated that students whose parents had high levels of formal education were more likely to have high levels of initial goal and institutional commitments. This is consistent with Tinto's theoretical expectations and with previous research (e. g., Pascarella, Duby and Iverson, 1983; Braxton, Vesper and Hossler, 1995). In addition, student family background indirectly and positively predicted student retention.

Pre-college schooling was measured by student high school scores and individual attitudes were measured by general reasoning test scores. The results of the SEM indicated that high school score was not a significant predictor of initial goal and institutional commitment. Similarly, it was found that the general reasoning test was not a significant predictor of initial goal and institutional commitment. Although these findings are inconsistent with Tinto's theory, they are not surprising because several studies conducted at residential institutions have reported similar conclusions (e.g., Pascarella and Terenzini, 1983; Terenzini, Pascarella, Theophilides and Lorang, 1985; Braxton and Brier, 1989; Berger, 1997; Milem and Berger,

1997; Berger and Braxton, 1998; Berger and Milem, 1999; Bray, Braxton and Sullivan, 1999).

However, the high school test was found to have a small direct positive effect on student retention while the general reasoning test did not. This finding was not hypothesized and is not consistent with Tinto's theory. However, it is supported by several studies conducted by Munro, 1981; Pascarella and Chapman, 1983a; Williamson and Creamer, 1988; Brower, 1992; and Berger, 1997, who reported that students with higher high school scores were more likely to remain in university than those with lower scores. In addition, two studies conducted in Saudi Arabia by Al-Raegi (1981) and Aldoghan (1985) found similar results. This result suggests that the high school test has greater validity than the reasoning test in predicting student success as measured by retention.

6.3.2 The effects of students' initial goal and institutional commitments

It was hypothesized that students' initial goal and institutional commitments were related to their social and academic integration. The results of the SEM indicated that initial goal and instructional commitment was significant predictor of academic integration, but failed to predict social integration. This indicated that students with high levels of initial commitments were more likely to have high levels of academic integration. These findings are also consistent with previous studies conducted by Pascarella and Terenzini (1983) and Pascarella, Terenzini, and Wolfle (1986) and Stage (1988).

In addition, it was hypothesized that initial goal and institutional commitments were related to later goal and institutional commitments. The results of the SEM indicated that initial commitment had a significant effect on later commitment. This indicated that those students who had high levels of initial commitment were predicted to have high levels of later commitment. This is consistent with Tinto's theory and with previous studies conducted at residential institutions (e.g., Pascarella, Terenzini and Wolfle, 1986; Stage, 1988; Braxton, Milem and Sullivan, 2000; and Braxton, Bray, and Berger, 2000).

6.3.3 The effects of students' levels of academic and social integrations

It was hypothesized that students' academic and social integration had positive effects on their later goal and institutional commitments. Academic integration is defined as the student's perceived academic performance and intellectual development while social integration is defined as the quality of a student's relationships with both the peer group and the faculty (Pascarella and Terenzini, 1980). However, the results of the SEM indicated that both types of integration did not play any role in predicting either later commitments or student retention. These findings are surprising because they are not consistent with Tinto's theoretical expectations or with previous studies (e.g., Munro, 1981; Pascarella and Terenzini, 1983; Pascarella, Terenzini and Wolfle, 1986; Cabrera, Castaneda, Nora, and Hengstler, 1992; Braxton, Vesper, and Hossler, 1995; Berger and Milem, 1999).

However, the results from the qualitative data help to explain why student academic and social integration did not play a role in predicting student retention. The interviews with students who persisted and who dropped out showed that neither group of students had positive experiences in the university. Students could not establish good relationships with staff members in or out of classes. Students complained about how the staff members treated them, citing a variety of unsupportive behaviours. It is notable that recently, the Director of this university has opened a centre to protect the right of students. The aim of this centre is to create a supportive climate for the promotion of student rights (Alriyadh, 2007). Further data from the qualitative study suggests that few students attended or were aware of the induction week and few engaged in any kind of social activities on the campus. The finding that academic and social integration constructs did not have any influence on the student retention process is therefore possibly explained by the findings from interviews that only low levels of academic and social integration exist in this university system.

6.3.4 The effects of students' later goal and institutional commitments

It was hypothesized that students' later goal and institutional commitments had positive effects on student retention. The results of the SEM indicated that later goal and institutional commitment was a significant predictor of student retention. This indicated that those students who have high levels of later commitment were more likely to persist than those with low levels.

This finding is consistent with Tinto's theory and previous studies conducted at residential institutions (e.g., Pascarella, Terenzini and Wolfle, 1986; Berger and Braxton, 1998; Braxton, Bray, and Berger, 2000; and Braxton, Milem and Sullivan, 2000).

In addition, the results of SEM produced an additional finding which was not hypothesized and is not consistent with Tinto's theory. It was found that initial goal and institutional commitments had a stronger direct effect on student retention than later goal and institutional commitments. This finding was also not consistent with previous studies which indicated that the strongest predictor of student retention was later commitments (e.g., Braxton, Bray, and Berger, 2000; Braxton, Milem and Sullivan, 2000). Initial commitment was measured at the beginning of the first semester and later commitment was measured at the end of the first semester. One possible explanation of this finding may be due to the negative experiences of freshman students in the social and academic systems of the university. Although students entered with high levels of commitments because students had negative experiences of the university, their later commitments decreased.

In conclusion, the results from the quantitative data indicated that Tinto's theory was not useful in explaining student retention at King Saud University. The variables in the model accounted for a small amount of variance in retention. Moreover, only three variables had direct effects on retention. The largest direct effect on retention was accounted for by initial

goal and institutional commitment (0.49), followed by later goal and institutional commitment and pre-college schooling as measured by high school scores (0.10).

6.4 Other findings from qualitative data

Tinto's theory was not found to be useful in explaining the retention process for Saudi students. The findings from the quantitative data did not explain why Saudi freshman students dropped out from King Saud University before completing their studies. The results from the qualitative data provide further information about this issue. Students who persisted and who dropped out, and staff members at King Saud University were asked to indicate the factors they perceived were influencing student retention at this university.

Fifteen factors or reasons were identified. These factors can be classified into two groups: institutional factors and non-institutional factors. The participants cited six institutional factors and nine non-institutional factors as the main factors affecting student retention at King Saud University. These factors are displayed in Table 6.1.

Table 6.1 Factors affecting student retention at KSU

<i>Institutional Factors</i>	<i>Non-institutional Factors</i>
Difficulties of students to select their majors.	Lack of motivation
Difficulties of students to transfer to other majors.	Admitted in other university or finding a job
Irregularity of student monthly reward.	Difficulties finding a job after graduating and their majors having no career path.
Lack of academic advice and guidance	Un-preparedness for living away from home.
Difficulties adjusting to university climate and a lack of knowledge of the university system	Financial problems
Lack of relationships with staff members	Distance from university.
	Low prior educational preparedness
	Family problems
	Low GPA.

Within the institutional factors, the most important was that students *could not select their desired major*. This factor was cited by 77% of non-persisters, 47% of persisters, and 38% of staff members. Students select their major based on their combination scores from the high school test and the General Reasoning test, and each major requires a specific score to be achieved. Another institutional factor was that students *could not*

transfer to their desired major. According to the university policy, students can transfer to another major if they get more than 2.5 in their GPA and also if there is a place available in the desired 'new' major. This factor was cited by 41% of the non-persisters, 40% of the persisters, and 8% of the staff members.

Another institutional factor was that students *did not get their monthly rewards on time.* General and higher education in Saudi Arabia is free. Moreover, university students receive monthly rewards from the government. As some students depended on this reward, irregularity of this reward may affect their commitment to their studies and ultimately their retention. This factor was cited by 12% of the non-persisters, 27% of the persisters, and 6% of the staff members. Research has indicated that financial aid plays an important role in student retention decisions (Astin, 1975; Bean and Metzner, 1985; Voorhees, 1985; Cabrera *et al.*, 1990; Nora, 1990; and Cabrera *et al.*, 1992). Bean and Metzner (1985) argued that finances not only impact student retention directly, but extend indirectly through academic and psychological factors. Using structural equation modelling, Cabrera *et al.* (1990) examined the role of financial aids within the Tinto model. They found that financial aid had a direct effect on student retention for a national sample of students attending four-year institutions.

The *lack of academic advising and support* was other factor. This factor was also cited by 6% of the non-persister, 20% of the persister, and 8% of

the staff members. Research had indicated the importance of academic advising on student retention (Metzner, 1989; Thomas, 1990; Seidman, 1991; King, 1992; and Peterson, Wagner, and Lamb, 2001). For example, Seidman (1991) found that students receiving pre- and post-admission advising persisted into the second year at a rate of 20 percentage points more than their peers who received no advising. Braxton, Duster and Pascarella (1988) examined the influence of academic advising within the Tinto model. Using Path Analysis, they found that academic advising had a positive indirect effect on retention through academic integration and subsequent institutional commitment.

A difficulty for students *adjusting to the university climate and lack of knowledge of the university system* was another factor. This factor was cited by 6% of the non-persisters, 27% of the persisters, and 21% of the staff members. The last institutional factor cited was that students did not have good relationships with staff members, and was cited by 27% of the persisters and even by 16% of the staff members. However, it was not cited by the non-persisters.

In addition, participants cited nine non-institutional factors affecting student retention. The most cited factor was *distance from university*. This factor was cited by 18% of the non-persisters and 20% of the persisters. None of the staff members cited this factor. The second non-institutional factor was *difficulties finding a job after graduating and their majors have no career path*. This factor was cited by 12% of non-persisters and 14% of both

persisters and staff members. The third non-institutional factor was that students *felt unprepared for living away from home*. This factor was cited by 12% of non-persisters and 14% of both persisters and staff members. The fourth non-institutional factor was that students were *admitted to other universities or got jobs*. Because higher education is free, some students apply to many universities at the same time. Moreover, some students apply for both university and for a job. Their main goals are not studying but to stay at the university until they find a job. They do that not just because studying at university costs them no thing, but because also they receive the student allowance noted above. Once they get the job, they drop-out from university. This factor was cited by 6% of the non-persisters, 14% of the persisters, and 8% of the staff members. The fifth non-instructional factor was *financial problems*. This factor was cited by a small number of non-persisters, persisters, and staff members. The sixth non-institutional factor was a *Lack of motivation*. None of non-persisters cited this factor. This factor was cited by 14% of persisters and 41% of staff members.

The following and final three factors were cited only by some of the staff members. These factors were family problems, low prior educational preparedness, and low grade point average. However, as suggested by Tinto (1993) voluntary withdrawals are significantly different from forced withdrawals. Therefore, the last two factors might cause students to involuntary drop-out from the university but do not tell us much about voluntary drop-out or attrition.

To sum up, although there are many factors beyond the control of the university, but there are many within its control. These findings suggest that King Saud University can increase the student retention rate by focusing on the factors within its control.

6.5 Conclusion

This chapter discussed and integrated the findings obtained from the qualitative and quantitative data to identify factors influencing Saudi freshman students at King Saud University using Tinto's theory.

The findings from the qualitative and quantitative data indicated that Tinto's theory was not useful in explaining the retention process of Saudi freshman students because the variables in the model explained only a limited amount of variance in student retention. Moreover, the major constructs in this theory such as academic and social integration, failed to exhibit any differences between students who persisted and those who dropped out.

The findings from the quantitative data indicated that only three variables in Tinto's theory had direct effects on student retention. The largest direct effect was accounted for by initial goal and institutional commitment, followed by later goal and institutional commitment and pre-college schooling as measured by high school scores.

The findings from the qualitative data not only help to explain and confirm the quantitative findings but also identify why Saudi freshman students leave the university before completing their studies. The most important

factors were difficulties of selecting majors, difficulties of transferring between subjects, lack of academic advice, and irregularity of monthly reward.

Chapter 7 - Summary, conclusions and recommendations

7.1 Introduction

The final chapter of this study presents a summary of the major findings, recommendations for practice and future research; and, some limitations.

7.2 Purpose of the study

The purpose of this study was to identify the factors affecting student retention at King Saud University. This study was guided by Tinto's (1975) student integration theory. This theory is longitudinal and dynamic and views student retention decisions largely as the results of interactions between the student and the academic and social systems of the institution (Tinto, 1975, 1993).

The theory suggests that students enter a particular college or university with a set of background characteristics. These entry characteristics include family background, individual attributes and pre-college schooling. Family background characteristics include family social status, parental level of formal educational and parental expectations for their children's future. Examples of individual attributes include academic aptitude, race, age and gender. Pre-college schooling experiences include the characteristics of the student's secondary school, high school academic achievement and academic course work. These student entry characteristics are said to directly influence students' initial goal and institutional commitments. Goal commitment represents the degree to

which the student is committed, or motivated to get a university degree in general while institutional commitment represents the degree to which the student is motivated to graduate from a specific university (Tinto, 1993).

Initial goal and institutional commitments affect the students' degree of integration into the academic and social systems of the university. Academic integration consists of both structural and normative dimensions. Structural integration involves meeting the explicit standards of the university, whereas normative integration relates to the degree to which an individual identifies with the normative structure of the academic system (Tinto, 1975, p.104). Social integration refers to the degree of congruency between the individual student and the social systems of the university. Tinto indicated that informal peer group associations, extracurricular activities and interaction with faculty and administrators are mechanisms whereby social integration takes place (Tinto, 1975, p.107).

Academic and social integration affect the students' later goal and institutional commitments. Moreover, both later commitments are also affected by the students' initial levels of commitment. Tinto states that 'in the final analysis, it is the interplay between the individual's commitment to the goal of college completion, and his commitment to the institution that determines whether or not the individual decides to drop out from college' (Tinto, 1975, p.96).

7.3 Overview of the methodology

This study used a mixed methods approach. Using the terminology of Creswell (2003), the appropriate description of the overall design of this study is a mixed methods concurrent triangulation strategy. This means that 'qualitative and quantitative data are collected and analyzed at the same time. Priority is usually equal and given to both forms of data. Data analysis is usually separate, and integration usually occurs at the data interpretation stage' (Hanson *et al.*, 2005, p. 229). This strategy was selected as it allows the findings to be confirmed, cross-validated, and corroborated within a single study (Creswell, 2003).

This strategy consisted of two phases. The first phase utilised a quantitative approach. Quantitative data were collected from 414 freshman students using two questionnaires administered at two occasions and augmented by data drawn from the university admission office. The quantitative data were analysed using a structural equation modelling (SEM) technique.

The second phase of this study utilised a qualitative approach. Qualitative data were obtained from three sources: non-persister students, persister students, and staff members. Seventeen non-persister students were interviewed over the phone; 15 persister students were interviewed using a focus group technique; while staff members were asked to complete a survey. Of the 200 surveys distributed, 37 were returned included

responses from 16 lecturers, 12 administrators, 5 librarians and 4 academic advisors.

7.4 Major findings

The quantitative data obtained from 414 freshman students were analyzed using structural equation modelling (SEM). The results of the SEM indicated that Tinto's model were not useful in predicting the Saudi freshman student retention process. The variables in the model explained only 30 percent of the variance in student retention. The results of the SEM indicated that four of the nine hypotheses proposed in Tinto's model were supported by statistically significant results. These supported hypotheses were: (1) Students' family background positively predicted their initial goal and institutional commitments; (2) Students' initial goal and institutional commitments positively predicted their later goal and institutional commitments; (3) Students' initial goal and institutional commitments positively predicted their levels of academic integration; (4) Students' later goal and institutional commitments positively predicted their retention.

The five unsupported hypotheses in the model were: (1) Students' pre-college schooling failed to predict their initial goal and institutional commitments; (2) Students' attitude failed to predict their initial goal and institutional commitments; (3) Students' initial goal and institutional commitments did not predict their levels of social integration; (4) Students' academic integration did not predict their later goal and institutional

commitments; and (5) Students' social integration did not predict their later goal and institutional commitments.

Moreover, the SEM produced other significant results which were not hypothesised in the model. These were: (1) Students' initial goal and institutional commitments positively predicted their retention; (2) Students' social integration positively predicted their academic integration; and (3) Students' pre-college schooling positively predicted retention.

Qualitative data were obtained from persisters, non-persisters students, and staff members. A comparison was made between those students who persisted and those who dropped out using constructs from Tinto's theory. It was found that persister students appeared to have higher levels of goal and institutional commitment than non-persister students. Regarding the academic and social integration, it appeared that no difference existed between both those who persisted and those who did not.

In addition, participants (persister students, non-persister students, and staff members) were asked to identify relevant factors affecting student retention. From non-persister students' perspective, the factors were: difficulties in selecting the desired major (77%); difficulties transferring to another major (41%); distance from university (18%); the irregularity of the student monthly reward (12%); difficulties finding a job after graduating when their majors having no career path (12%); being unprepared for living away from home (12%); lack of advice and guidance (6%); getting admitted to another university or finding a job (6%); financial problems

(6%); and, difficulties adjusting to the university climate and a lack of knowledge of the university system (6%).

The major factors as perceived by persisting students were: difficulties in selecting their desired major (47%); difficulties transferring to other colleges or departments (40%); the irregularity of the student monthly reward (27%); difficulties adjusting to the university climate and a lack of knowledge of the university system (27%); a low level of interaction with staff members (27%); getting admitted to another university or finding a job (27%); distance from university (20%); a lack of advice and guidance (20%); a lack of motivation (14%); difficulties finding a job after graduating when their majors having no career path (14%); having financial problems (14%); and, being unprepared for living away from home (14%).

The major factors as perceived by staff members were: a lack of motivation (41%); difficulties in selecting their desired major (38%); difficulties adjusting to the university climate and a lack of knowledge of the university system (21%); getting admitted to another university or finding a job (19%); a low level of interaction with staff members (16%); difficulties finding a job after graduating when their majors having no career path (14%); being unprepared for living away from home (14%); low prior educational preparedness (14%); family problems (14%); low grade point average (11%); difficulties transferring to other colleges or departments (8%); a lack of advice and guidance (8%); having financial problems (8%); and, the irregularity of the student monthly reward (6%).

In summary, the results presented in this thesis suggest that Tinto's theory of retention is not suitable as a means of explaining student behaviour in the Saudi higher education system. It is suggested that due to the specific context, elements of theory which were applicable in western education systems are not transferable to this context. In particular, there are features of the Saudi system which make the application of Tinto's theory problematic. For example, the admissions procedure which operates in Saudi Arabia results in a situation where students have little real choice in their course or programme of study. In addition, segregation between the sexes means that social interaction takes place in a quite different context than in western societies. Moreover, higher education is free in Saudi Arabia and students are provided with an allowance while studying. This means that students do not have a personal investment in completing their studies.

This can result in a situation where students have little commitment or motivation to study on a programme or within a subject in which they have little interest. This was noted by both students and staff as a major factor in student attrition. It is not surprising that students have low motivation when they are not allowed to select their own course or subject area. In addition, cultural issues result in a situation where there are few opportunities for informal contacts between students and staff making it less likely that integration, seen as important by Tinto, will occur. Similar problems arise when alternatives to Tinto's theory of retention are examined. This again in part, can be related to socio-cultural differences

that arise when attempting to apply theory developed in one context to another.

In order to develop a theory which may be applicable on the Saudi context, it is suggested that more detailed research is required on a larger scale than was possible in this study.

7.5 Limitations

This study has some limitations that must be taken into consideration. First, this study was conducted at a single, public, and residential university. Therefore, the findings of this study may not be generalizable to other types of universities. However, Tinto (1993) emphasized that his theory attempts to explain student retention process within a given college or university and 'is not a systems model of departure' (p. 112).

Second, this study focused only on student retention during the freshman year, and therefore, student retention in subsequent years was not assessed. Another limitation was that this study was not able to confirm whether those students who did not persist at King Saud University actually transferred to another university; and whether or not they will eventually return to study at King Saud University or to another university.

7.6 Recommendations for practice

Based on the findings of this current study and the associated literature review, the following recommendations are provided in order to address how the Ministry of Higher Education in Saudi Arabia and King Saud University in particular can improve issue of student retention.

1. Although the General Reasoning Test has been used for admission to higher education in Saudi Arabia since 1999, no published studies have examined its validity in predicting student success. The quantitative results found that this test had no significant effect on student retention. Therefore, it is recommended that the Ministry of Higher Education in Saudi Arabia and King Saud University should do more detailed research to determine the predictive validity of this test in predicting student academic performance and retention.
2. Given that the General Reasoning Test appears to have little predictive validity in terms of student progression and retention, it would appear that using this as a selective screening device to allocate students to subjects is unlikely to result in an optimum match of students with subjects they are interested in studying.

However, any changes to the present system would require to be piloted to gauge the impact on retention and progression. One possible option would be to allow some form of student selection of degree programme. An incremental approach would be to allow all students who achieve marks for both the high school tests and the general reasoning test that rank them in the top ten percent of the distribution to be given a greater opportunity to select their course or programme of study than happens at present. One possible alternative would be to allow the prospective student to select three

degree programmes, ranked by preference, which they wish to study. Subsequent selection for places with high demand would be done on the basis of a face to face interview with members of university staff. The interview would allow staff to select students not only with the academic ability to succeed at university, but also with the interest and motivation to study a degree programme of interest to the student which is also required to succeed.

In addition, given the often negative relationships between staff and students reported earlier, it may well be that some form of staff development would be required in order train staff to conduct interviews in a fair and professional manner.

The next stage would be to examine whether or not the initiative had a positive influence on retention and progression for that group of student who had been given a personal choice in relation to their programme of study. If results indicated an improvement in retention and progression, then the process could be introduced for students in the next decile in terms of performance. Given continued improvements in retention and progression, the scheme could be expanded incrementally and by deciles until all those who meet the minimum requirements in both high school and the general reasoning test are allowed an element of personal choice in their selection of degree programme.

3. Previous research has indicated the importance of financial aid on student retention (Astin, 1975; Bean and Vesper, 1990; Cabrera *et al.*, 1990; and Cabrera *et al.*, 1992). In Saudi Arabia, both general education and higher education are free and in addition university students also receive a financial reward every month in the form of grant. The data from focus groups and interviews indicated that students often did not receive this reward on time, and that this factor may be an important one in explaining retention. Thus, it is recommended that King Saud University should take steps to ensure that this financial reward should be deposited in the students' bank accounts on time and when expected.

4. Previous research has indicated the importance of high levels of student-faculty interaction on student retention (Tinto, 1993; Pascarella and Terenzini, 2005). However, the results from the quantitative data in this study suggested that student-faculty interaction, as an indicator of social integration, did not impact on student retention. Data from the qualitative phase of this research suggests why this factor did not affect student retention in this context. A number of students who persisted and who dropped out complained about their relationships with faculty members.

It is suggested that increased contact between students and staff in more informal settings could go some way to overcoming the cultural hierarchy which is apparent from student comments in

earlier chapters. At present, relations between students and staff are a result of the cultural norms that operate in Saudi Arabia. This results in a climate where student interests are seen perhaps to be of no interest to members of staff and as such there are few opportunities for student concerns to be communicated to members of staff. One other possible option is the formation of a student council where issues and concerns raised by the students could be communicated to staff. This may require the creation of a staff position with responsibility for student liaison and for communicating student concerns to academic staff through appropriate channels.

5. Previous research had indicated the importance of participation in university social activities for student retention (Tinto, 1993; Pascarella and Ternzini, 2005). The results from the qualitative parts of this study indicated that neither students who persisted nor those who dropped out involved themselves in any kind of social activities while at university.

Social integration and students interactions with each other outside of class should be encouraged. As noted, little social interaction and thus little social integration would appear to be taking place at present. One way to help achieve this is by allowing students to form clubs and societies where students can meet and socialise with each other. However, in order for this to be seen as student-focused it would require student involvement in the choice of clubs

and societies to be formed. It would also require some form of institutional support in order to provide spaces where such societies could meet, and also, in the case of clubs related to sports or music for example some form of institutional support in the form of finance to provide equipment and facilities to enable the pursuit of these types of activities.

Moreover, the institution itself could do more to encourage student social integration and interactions. University competitions in sports could be introduced. This could be done at the level of the faculties, whereby teams formed from within each faculty would compete against each other creating a sense of ownership amongst students and integrating them to more closely identify with fellow students in their own faculty. Finally, the provision of student social spaces should be encouraged to allow students to mix and interact in an informal way outside of the classroom.

6. The results from the qualitative phase also indicated that almost all students dropped out because they could not select their desired majors and that they did not have the opportunity to transfer to their desired majors. Thus, it is recommended that King Saud University should make sure that students have a greater opportunity to select their desired major and to simplify the procedures for transferring to other majors.

7. Previous research has confirmed the importance of academic advising and support on student retention (Thomas, 1990; Pascarella and Terenzini, 2005). Qualitative data showed that both students who persisted and those who dropped out complained about a lack of support and advice. Almost all students interviewed did not attend the induction weeks and thus did not get information about the university and where and how to access help and support. Therefore, it is recommended that King Saud University should provide more support and advice to students especially to freshman students during the first two weeks. In addition, it is also suggested that induction needs to be more central in the planning of the first semester and the importance of induction events should be promoted more vigorously to students in order to convince them to attend.

7.7 Recommendations for further research

Based on the literature reviewed in chapter two and the empirical data presented and discussed in chapters four, five, and six, the following recommendations are made for increasing student retention.

1. This study could be replicated with another sample at the same university in order to confirm the findings of this current study in relation to: the low levels of social and academic integration; the issues raised in relation to choice of major, and the apparent difficulties in transferring to another major or institution.

2. The current study was conducted at a public, large residential university in Saudi Arabia. Future research needs to be conducted at other types of institutions in Saudi Arabia such as private universities and community colleges. One student in Section 5.4.3 noted that the college he had transferred to had better staff/student relationships resulting in a more supportive environment.
3. The current study focused on the retention of Saudi male students. Since there might be a gender differences, future research should focus on the retention of Saudi female students. Given the cultural context, it is suggested that gender differences may exist in relation to motivation, staff/student interactions and eventual career opportunities.
4. The current study identified factors affecting student retention during the first year. Since the pattern of influences may not be the same for other students in their sophomore, junior, and senior years, future research should also focus on student retention in subsequent years. Houston *et al.*, (2003) found that while non-progression was greatest in the first year, it was still an issue in subsequent years.
5. The current study found that the General Reasoning result had no significant effect in predicting student retention. Although this test has been used for admission to university in Saudi Arabia since 1999, no published studies have examined its validity in predicting

student retention and academic performance. For this reason, more research is required to determine the usefulness and the validity of this test in predicting student success. This would require a longitudinal design and larger sample drawn from a number of different institutions. This would provide a more detailed analysis of the relationship between the General Reasoning test and successful completion of a course or programme of study.

6. As reported in the literature review in chapter two, few quantitative studies have employed a structural equation modelling method. It is recommended that researchers should use this statistical method because it is able to take measurement error into account. Ignoring measurement error could lead to systematic bias in parameter estimates. In addition, the method allows complex phenomena to be modelled and tested.
7. Previous studies indicated that faculty-student interaction had a positive direct effect on student retention. However, in this current study it was found that both those who persisted and those who dropped out had negative or poor relationships with staff members. Therefore, staff development programmes should be developed and implemented utilising examples of best-practice in this area drawn from the existing literature on staff/student interactions and academic integration. This would involve educating staff members on the importance of having good relationships with students and

how to motivate them to be proactive in pursuing such relationships with students. These would then require to be evaluated in order to check whether they had achieved the desired outcomes.

8. Previous studies indicated that student involvement in extracurricular activities was positively related to student retention. However, this study found that both students who persisted and who dropped out were not keen to participate in any extracurricular activities. Thus, future research should investigate how students might be encouraged to participate in such activities. This would most profitably be done in conjunction with activities designed to promote the important role of peer relationships in the overall student experience. Promotional materials for these new initiatives should also stress the benefits, in terms of performance and progression, that can result from such social activities.
9. Consistent with previous research, this study indicated that Tinto's theory explained only a small proportion of the variance in student retention. This indicates that at least some important predictors of student retention may not be properly specified by the theory. Thus, more research is needed to identify these predictors. As noted earlier, this would require a larger sample and preferably more than one institution.
10. The current study focus only on factors drawn from Tinto's theory. Future research might investigate additional factors such as the role

of academic advising and the impact of different teaching and learning methodologies. This might then increase the proportion of variance explained in any future explanatory model of student retention at KSU.

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APPENDICES

**APPENDIX A: PERMISSION LETTER FROM KING
SAUDI UNIVERSITY**

Kingdom of Saudi Arabia
Ministry of Higher Education
King Saud University
VICE PRESIDENT'S OFFICE
for Graduate Studies & Research

بسم الله الرحمن الرحيم



المملكة العربية السعودية
وزارة التعليم العالي
جامعة الملك سعود
مكتب وكيل الجامعة
للدراستات العليا والبحث العلمي

التاريخ: ١٤٤٦/٧/٢٤

الرقم: ٤٦٧٠١٠٨

حفظه الله

سعادة الملحق الثقافي في بريطانيا

السلام عليكم ورحمة الله وبركاته ...
إشارة إلى طلب الطالب / سعيد بن عبدالله الدوسري المبتعث من قبل وزارة التعليم العالي للدراسة لدرجة الدكتوراه في مجال التربية بجامعة استرلنج في اسكتلندا ، ورغبته في إجراء بحث في جامعة الملك سعود ابتداءً من منتصف سبتمبر ٢٠٠٥م إلى منتصف يناير ٢٠٢٦م ، وموضوع بحثه " البحث في العوامل التي تؤدي إلى انسحاب الطلاب من جامعة الملك سعود "

نفيدكم بأن الجامعة لا مانع لديها من قيام الطالب المذكور أعلاه من عمل البحث خلال الفترة المحددة .

وتقبلوا خالص تحياتي ،،،

وكيل الجامعة

للدراستات العليا والبحث العلمي

عبدالمحسن بن وني الضويان

مع لكتي ، رؤساء إمتام ٢ مع ١

مدافع - مدعو مع استبانة
شاهد عن موافقة سادة وكيل
الجامعة - على اضلاع استجدية

١٤٤٦/٩/٥

د عبدالله الزهراني
د محمد بن محمد بن
عبدالله بن محمد بن
أحمد بن محمد بن
تقبلوا خالص تحياتي
١٤٤٦/٩/٥

تم ارسالها بالفاكس
٢٤/٤٤
١٤٤٦

APPENDIX B: THE TWO QUESTIONNAIRES IN ENGLISH AND ARABIC

First Questionnaire:

Please take some time to complete this questionnaire. The purpose of this questionnaire is to identify the factors affecting students’ retention at King Saud University. Your responses will provide important information that will help your university in planning better ways to support your academic success and retention. You do not have to complete this survey if you do not wish to do so. However, everyone’s views are important and the more participation we receive. The better the results will be. To complete the questionnaire, circle the number that best represents how closely you agree with the statement at the present time. Circle only one number for each item. To change an answer, draw an X through the incorrect response and circle the desired response. All questionnaire data will be confidential.

Your ID number:.....

What is your mother’s formal education?

1. Primary School Graduate or Less 2. Secondary School Graduate 3. High School Graduate
 4. Bachelor’s Degree 5. Master’s Degree or Above

What is your father’s formal education?

1. Primary School Graduate or Less 2. Secondary School Graduate 3. High School Graduate
 4. Bachelor’s Degree 5. Master’s Degree or Above

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1	2	3	4	5

Items	Options				
1. It is important for me to graduate from university.	1	2	3	4	5
2. I am confident that I made the right decision in choosing to attend King Saud University.	1	2	3	4	5
3. It is likely that I will re-enrol at King Saud University next semester.	1	2	3	4	5
4. It is not important to me to graduate from King Saud University.	1	2	3	4	5
5. Getting good grades is not important to me.	1	2	3	4	5

Thank you for your time.

Second Questionnaire:

Completing the questionnaire:

The following questionnaire contains 29 items that ask you how you feel about yourself and your life situation at King Saud University. To complete the questionnaire, circle the number that best represents how closely you agree with the statement at the present time. Circle only one number for each item. To change an answer, draw an X through the incorrect response and circle the desired response. All questionnaire data will be confidential.

Your ID number:.....

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1	2	3	4	5

1. Since coming to this university, I have developed close personal relationships with other students.	1	2	3	4	5
2. My non-classroom interactions with faculty have had a positive influence on my personal growth, values and attitudes.	1	2	3	4	5
3. Few of the faculty members I have had contact with are generally interested in students.	1	2	3	4	5
4. I am satisfied with the extent of my intellectual development since enrolling in King Saud University.	1	2	3	4	5
5. It is important for me to graduate from university.	1	2	3	4	5
6. The student friendships that I have developed at this university have been personally satisfying.	1	2	3	4	5
7. My non-classroom interactions with faculty have had a positive influence on my intellectual growth and interest in ideas.	1	2	3	4	5
8. Few of the faculty members I have had contact with are generally outstanding or superior teachers.	1	2	3	4	5
9. My academic experience has had a positive influence on my intellectual growth and interest in ideas.	1	2	3	4	5
10. I am confident that I made the right decision in choosing to attend King Saud University.	1	2	3	4	5
11. My interpersonal relationships with other students have had a positive influence on my personal growth, attitudes and values.	1	2	3	4	5
12. My non-classroom interactions with faculty have had a positive influence on my career goals and aspirations.	1	2	3	4	5
13. Few of the faculty members I have had contact with are willing to spend time out of class to discuss issues of interest and importance to students.	1	2	3	4	5
14. I am satisfied with my academic experience at King Saud University.	1	2	3	4	5
15. It is likely that I will re-enrol at King Saud University next semester.	1	2	3	4	5

16. My interpersonal relationships with other students have had a positive influence on my intellectual growth and interest in ideas.	1	2	3	4	5
17. Since coming to this university, I have developed a close, personal relationship with at least one faculty member.	1	2	3	4	5
18. Most of the faculty I have had contact with are interested in helping students grow in more than just academic areas.	1	2	3	4	5
19. Few of my courses this semester have been intellectually stimulating.	1	2	3	4	5
20. It is not important to me to graduate from King Saud University.	1	2	3	4	5
21. It has been difficult for me to meet and make friends with other students.	1	2	3	4	5
22. I am satisfied with the opportunities to meet and interact informally with faculty members.	1	2	3	4	5
23. Most of the faculty I have had contact with are genuinely interested in teaching.	1	2	3	4	5
24. My interest in ideas and intellectual matters has increased since coming to King Saud University.	1	2	3	4	5
25. Few of the students I know would be willing to listen to me and help me if I had a personal problem.	1	2	3	4	5
26. I am more likely to attend a cultural event (for example, a concert, lecture or art show) now than I was before coming to King Saud University.	1	2	3	4	5
27. Getting good grades is not important to me.	1	2	3	4	5
28. Most students at King Saud University have values and attitudes different to my own.	1	2	3	4	5
29. I have performed academically as well as I anticipate I would.	1	2	3	4	5

Items adapted from the *Institutional Integration Scales* by Pascarella and Terenzini (1980).

Thank you for your time.

الاستبيان الاول:

فضلا خذ بعض الوقت لاكمال هذا الاستبيان الذي يهدف الي التعرف علي العوامل التي تؤدي الي انسحاب الطلاب من جامعة الملك سعود, وثق بان اجاباتك ستعطي معلومات هامة سوف تساعد جامعتكم في تخطيط طرق افضل لتعزيز نجاحكم الدراسي واستمراركم, غير انك لست مضطرا لاكمال هذا الاستبيان اذا لم تكن لديك الرغبة في ذلك. وعلي اية حال فان وجهات النظر لدي الناس تعد من الالهية بمكان وكما ازداد حجم الاسهام الذي نستقبله كلما كانت التناجج افضل. لكي تكمل هذا الاستبيان, ضع دائرة حول الرقم الذي يمثل بشكل افضل موافقتك الشديدة علي العبارة في الوقت الحالي, ضع دائرة واحدة فقط في كل فقرة, ولتغير اجابة ما ضع علامة X علي الاجابة التي تراها غير صحيحة ودائرة علي الاجابة المرغوبة. كل المعلومات في هذا الاستبيان تعتبر سرية.

رقمك الجامعي:.....

ما هو مستوي التعليم الرسمي الذي وصلت اليه والدتك؟
1. ابتدائي او اقل 2. خريجة متوسطة 3. خريجة ثانوية 4. درجة البكالوريوس 5. ماجستير فأعلي

ما هو مستوي التعليم الرسمي الذي وصل اليه والدك؟
1. ابتدائي او اقل 2. خريجة متوسطة 3. خريجة ثانوية 4. درجة البكالوريوس 5. ماجستير فأعلي

لا أوافق بشده	لا أوافق	ليس عندي جواب محدد	أوافق	أوافق بشده
1	2	3	4	5

الخيارات	الفقرة
5 4 3 2 1	1- من المهم بالنسبة لي أن أخرج من الجامعة.
5 4 3 2 1	2- أنا واثق بأنني اتخذت القرار الصحيح باختياري الالتحاق بجامعة الملك سعود.
5 4 3 2 1	3- من المحتمل أن التحق بجامعة الملك سعود الفصل الدراسي القادم.
5 4 3 2 1	4- ليس من المهم بالنسبة لي أن أخرج من جامعة الملك سعود.
5 4 3 2 1	5- ليس من المهم بالنسبة لي الحصول على درجات جيدة.

شكرا علي المساعدة.

أخي الطالب الكريم/

فضلا خذ بعض الوقت الاكمال هذا الاستبيان الذي يهدف للتعرف علي العوامل التي تؤدي الي انسحاب الطلاب من جامعة الملك سعود. هذا الاستبيان يحتوي علي 29 فقرة تدور حول شعورك تجاه نفسك وتجاه حياتك الجامعية في جامعة الملك سعود. لاكمال هذا الاستبيان ما عليك سوي وضع دائرة حول الرقم الذي يمثل بشكل افضل موافقتك الشديدة علي الفقرة في الوقت الحالي. ضع دائرة واحدة فقط في كل فقرة، ولتغيير اجابة ما ضع علامة (x) علي الاجابة التي تراها غير مناسبة. ثق بان اجاباتك ستعطي معلومات هامة وسوف نساعد الجامعة في تخطيط طرق افضل لتعزيز نجاحك الدراسي واستمرارك في الجامعة حتي التخرج ان شاء الله، وثق بان المعلومات الواردة في الاستبيان سرية.

رقمك الجامعي: -----

لاوافق بشده	لاوافق	ليس عندي جواب محدد	أوافق	أوافق بشده
1	2	3	4	5

الخيارات	الفقرة
5 4 3 2 1	1- كونت علاقات شخصية حميمة بطلاب آخرين منذ التحاقني بجامعة الملك سعود.
5 4 3 2 1	2- لقد كان لنشاطي الغير صفي في الكلية أثرا ايجابيا على نموي الشخصي وقيمي وسلوكياتي.
5 4 3 2 1	3- قليل من أعضاء الكلية الذين كنت على اتصال بهم يهتمون بالطلاب.
5 4 3 2 1	4- أنا مقتنع بمدى تطوري الفكري منذ التحاقني بجامعة الملك سعود.
5 4 3 2 1	5- من المهم بالنسبة لي أن أتخرج من الجامعة.
5 4 3 2 1	6- أشعر بالرضا تجاه العلاقات الشخصية التي كونتها مع الطلاب.
5 4 3 2 1	7- لقد كان لنشاطاتي الغير صفية مع أعضاء هيئة التدريس في الكلية أثرا ايجابيا على نموي الفكري واهتمامي بالأفكار المطروحة.
5 4 3 2 1	8- قليل من أعضاء الكلية الذين تعاملت معهم يعتبرون بصفة عامة بارزين أو معلمين جيدين.
5 4 3 2 1	9- لقد كان لخبراتي الاكاديميه أثرا ايجابيا على نموي الفكري وتوسيع مداركي.
5 4 3 2 1	10- أنا واثق بأنني اتخذت القرار الصحيح باختيارني الالتحاق بجامعة الملك سعود.
5 4 3 2 1	11- لقد كان لعلاقتي الشخصية المتبادلة مع الطلاب الآخرين أثرا ايجابيا على نموي الشخصي وعلى سلوكياتي.
5 4 3 2 1	12- لقد كان لعلاقتي الغير صفية في الكلية أثرا ايجابيا على أهدافي وتطلعاتي الوظيفية.
5 4 3 2 1	13- قليل من أعضاء الكلية الذين تعاملت معهم لديهم الاستعداد لقضاء وقت خارج قاعة المحاضرة لمناقشة قضايا ذات أهمية وشأن بالنسبة للطلاب.
5 4 3 2 1	14- أنا مقتنع بالخبرة التي اكتسبتها في جامعة الملك سعود.
5 4 3 2 1	15- من المحتمل أن التحق بجامعة الملك سعود الفصل الدراسي القادم.
5 4 3 2 1	16- لقد كان لعلاقتي المتبادلة مع الطلاب الآخرين أثرا ايجابيا على نموي الفكري واهتمامي بالأفكار المطروحة.
5 4 3 2 1	17- منذ التحاقني بجامعة الملك سعود كونت علاقات شخصية حميمة على الأقل مع عضو واحد من أعضاء هيئة التدريس في الكلية.
5 4 3 2 1	18- معظم أعضاء الكلية الذين تعاملت معهم مهتمون بمساعدة الطلاب على النمو في أكثر

					مما هو مجرد مجالات دراسية.
5	4	3	2	1	19- القليل من المواد هذا الفصل محفزة ومثيرة فكريا.
5	4	3	2	1	20- ليس من المهم بالنسبة لي أن أخرج من جامعة الملك سعود.
5	4	3	2	1	21- واجهت صعوبة في تكوين صداقات مع طلاب آخرين.
5	4	3	2	1	22- أنا مقتنع بالفرص المتاحة لي لمقابلة أعضاء الكلية والتعامل معهم بشكل غير رسمي.
5	4	3	2	1	23- معظم أعضاء الكلية الذين تعاملت معهم مهتمون بالتدريس فقط.
5	4	3	2	1	24- لقد ازداد اهتمامي بالأفكار والأمور العقلية منذ دخولي جامعة الملك سعود.
5	4	3	2	1	25- قليل من الطلاب الذين اعرفهم لديهم الرغبة أن ينصتوا لي ويساعدوني إذا واجهت مشكلة شخصية
5	4	3	2	1	26- أنا الآن أكثر احتماليه لحضور فعالية ثقافية (مثلا: حفل مسرحي, ندوة, معرض فني) عما كنت قبل التحاقني بجامعة الملك سعود.
5	4	3	2	1	27- ليس من المهم بالنسبة لي الحصول على درجات جيدة.
5	4	3	2	1	28- معظم طلاب جامعة الملك سعود لديهم قيم واتجاهات تختلف عن قيمي واتجاهاتي.
5	4	3	2	1	29- لقد كان أدائي الأكاديمي أفضل من المستوى الذي كنت أتوقعه.

شكرا علي المساعدة

**APPEINDIX C: TELEPHONE INTERVIEW AND FOCUS
GROUP INTERVIEW GUIDE IN ENGLISH AND
ARABIC**

Questions guide for phone interview and focus group:

Name:

Subject:

College:

Retention Status:

1. What influenced you to choose to study at KSU?
2. What influenced you to choose to study (subject) at KSU?
3. What was your main educational goal, when you enrolled at KSU?
4. Why did you decide not to complete your study at KSU?
5. Did you have discussed your decision to withdraw with anybody?
6. Describe the circumstances surrounding your decision to withdraw from KSU?
7. Did you seek assistance from academic advisors?
8. If so, describe your experiences with academic advisors?
9. Did you interact with faculty members while attending KSU?
10. How would you describe your interaction with faculty members?
11. What type of social interaction did you have while attending KSU?
12. How did the induction week help you to settle in?
13. How could your induction week be improved?
14. What are you doing now?
15. Do you have a desire to return to KSU at some future time?
16. Is there anything KSU could have done to help you complete your study?
17. Is there anything we should have talked about but did not?
18. Is there anything else you would like to say?

Focus Group:

1. Have you ever considered leaving KSU?
2. If so, what made you stay?
3. Why do you think some students have left KSU?
4. Is there anything KSU could do to improve student retention?

اسئلة الطلاب المنسحبون والمقيدون

الاسم:

التخصص:

الكلية:

الحالة الدراسية:

1. لماذا اخترت الدراسة في جامعة الملك سعود؟
2. لماذا اخترت التخصص الذي تدرسه؟
3. ما هو هدفك عندما التحقت بالجامعة؟ (بكالوريوس, ماجستير, دكتوراة)
4. لماذا قررت الانسحاب من الجامعة؟
5. هل ناقشت قرار الانسحاب مع اي شخص؟
6. صف الحالة عندما قررت الانسحاب من الجامعة؟
7. هل طلبت مساعدة من المشرف الاكاديمي؟
8. صف هذه المساعدة؟
9. هل لك علاقة مع اعضاء هيئة التدريس؟
10. صف هذه العلاقة؟
11. ما هي الانشطة التي كنت تمارسها في الجامعة؟
12. حدثني عن اسبوع المستجدين؟ هل ساعدك؟
13. وما هي الاشياء التي يجب وضعها في اسبوع المستجدين؟
14. ماذا تفعل الان؟
15. هل لك نية للعودة الي جامعة الملك سعود في المستقبل؟
16. هل هناك اي شي من المفترض علي الجامعة فعلة لمساعدتك علي النجاح؟
17. هل هناك اشياء لا بد من التحدث عنها ولكن لم نتطرق لها؟
18. هل عندك شي اخر؟

اسئلة الطلاب المقيدون:

1. هل فكرت في الانسحاب من الجامعة؟
2. ما هي العوامل التي ساعدتك علي الاستمرار؟
3. برايك ما هي العوامل الاساسية التي تجعل بعض الطلاب ينسحب من الجامعة؟
4. ما هي الاشياء التي يجب علي الجامعة فعلة لمساعدة الطلاب علي النجاح؟

APPENDIX D: STAFF SURVEYS IN ENGLISH AND ARABIC

Staff Retention Survey:

Dear Staff/ Administrative

Please take some time to complete this questionnaire. The purpose of this questionnaire is to identify the factors affecting students' retention at King Saud University. Your responses will provide important information that will help your university in planning better ways to support academic success and retention of the students.

1. What do you perceive as the primary reasons for attrition among KSU students?

2. What techniques or approaches do you employ as an advisor/ instructor to encourage students to persist toward completion of their academic goals?

3. Do you think that using GRT in admission will improve student retention? If yes why? If no why not?

4. What actions do you think KSU should take to increase student retention?

Thanks for your help

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سعادة عضو هيئة التدريس، الاداري في جامعة الملك سعود:
انا طالب دكتوراة في جامعة ستيرلنق في بريطانيا, ارجوا من سعادتكم اكمال هذا الاستبيان ولكم مني خالص
الشكر والتقدير.
هذا الاستبيان يهدف للتعرف علي العوامل المؤثرة علي انسحاب الطلاب من الجامعة. فضلا خذ بعض الوقت
لاكمال هذا الاستبيان وثق بان اراءك واقتراحاتك سوف تساعد في تخطيط طرق افضل لتعزيز نجاح الطلاب
واستمرارهم. وشكرا. الرجاء تسليم هذا الاستبيان الي سكرتارية القسم.
الباحث: سعيد الدوسري جوال 0569363302

1. ماهي باعتقادك العوامل الاساسية لانسحاب الطلاب من جامعة الملك سعود؟

2. ماهي الطرق والوسائل التي تستخدمها لتشجيع الطلاب للاستمرار في الجامعة حتي تخرجهم؟

3. هل تعتقد ان استخدام اختبار القدرات في القبول يقلل من انسحاب الطلاب من الجامعة؟

4. ماهي باعتقادك الاجراءات التي علي الجامعة اتخاذها للتقليل من انسحاب الطلاب من الجامعة؟

شكرا علي المساعدة

APPENDIX E: LIST OF WITHDRWAN STUDENTS

APPENDIX F: INFORMED CONSENT FORM

Informed Consent Form (Focus Groups Interviews):

Your signature on this form gives your consent to participate in this study. This study will serve several purposes: (a) to add to the existing research about the retention of university students; (b) to provide information that may be useful in the improvement of higher education policy; (c) to meet requirements for a doctoral degree in higher education retention.

This study will consist of an approximately one hour focus group interview. This interview will be recorded.

No personal identifying information about you as a participant will be published in any analysis of data resulting from this study. In addition, no personal information about you will be shared with other persons without consent from you.

Participation in this study is entirely voluntary and you may withdraw consent and terminate participation by notifying the researcher at any time without consequence.

If you have any questions about this research or concerning your right, call me at 0569363302.

I have been fully informed on the above-described procedure and I give my permission for participation in this study.

Name:-----

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Signature:-----

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Date:-----

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Informed Consent Form (Questionnaires):

Your signature on this form gives your consent to participate in this study. This study will serve several purposes: (a) to add to the existing research about the retention of university students; (b) to provide information that may be useful in the improvement of higher education policy; (c) to meet requirements for a doctoral degree in higher education retention.

This study will consist of two questionnaires. The first questionnaire will be administered in the beginning of this semester. The second one will be administered at the end of this semester. Results of High School, Ability Test, and GPA will be requested from university admission record.

No personal identifying information about you as a participant will be published in any analysis of data resulting from this study. In addition, no personal information about you will be shared with other persons without consent from you.

Participation in this study is entirely voluntary and you may withdraw consent and terminate participation by notifying the researcher at any time without consequence.

If you have any questions about this research or concerning your right, call me at 0569363302.

I have been fully informed on the above-described procedure and I give my permission for participation in this study.

Name:-----

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Signature:-----

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Date:-----

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الموافقة الرسمية للمشاركة في هذه الدراسة: (المقابلات مع الطلبة المقيديين)

التوقيع على هذه الورقة يعطي الموافقة على المشاركة في هذه الدراسة.

هذه الدراسة سوف يخدم عدة أغراض : (أ) أن تضيف الى قائمة الأبحاث عن العوامل التي تؤدي الى انسحاب الطلبة من الجامعة؛ (ب) توفير معلومات يمكن ان تكون مفيدة في تحسين سياسة التعليم العالي ؛ (ج) للوفاء بمتطلبات درجة الدكتوراه في التعليم العالي.

هذه الدراسة سوف تتكون من مقابلة مع مجموعة من الطلاب لمدة حوالى ساعة واحدة. وهذه المقابلة ستكون مسجلة.

أي معلومات محددة عن شخصيك كمشارك لن تنشر في اي تحليل للبيانات الناتجة عن هذه الدراسة. بالإضافة الى ذلك ، معلوماتك الشخصية سرية ولن تعرض لاي شخص من دون موافقة منك.

المشاركة في هذه الدراسة اختياري تماما ، ويمكنكم سحب الموافقة وانهاء المشاركة باشعار الباحث في اي وقت. اذا كانت لديكم اي اسئلة عن هذا البحث او بشأن حقكم ، اتصل بي علي هذا الرقم
0569363302

لقد كنت على علم تام الاجراء المذكور اعلاه واعطى الاذن للمشاركة في هذه الدراسة.

اسم : _____

التوقيع : _____

تاريخ : _____

الموافقة الرسمية للمشاركة في هذه الدراسة: (الاستبيان)

التوقيع على هذه الورقة يعطي الموافقة على المشاركة في هذه الدراسة.

هذه الدراسة سوف يخدم عدة أغراض : (أ) أن تضيف الى قائمة الأبحاث عن العوامل التي تؤدي الى انسحاب الطلبة من الجامعة؛ (ب) توفير معلومات يمكن ان تكون مفيدة في تحسين سياسة التعليم العالي ؛ (ج) للوفاء بمتطلبات درجة الدكتوراه في التعليم العالي.

تتألف هذه الدراسة من الاستبيانين. الاستبيان الاول سيقدم في بداية هذا الفصل الدراسي. اما الثانية فسوف يقدم في نهاية هذا الفصل الدراسي. نتائج الثانويه ، واختبارالفدرات و التحصيل الدراسي في الجامعة سيطلب من عمادة القبول و التسجيل.

أي معلومات محددة عن شخصيك كمشارك لن تنشر في اي تحليل للبيانات الناتجة عن هذه الدراسة. بالاضافة الى ذلك ، معلوماتك الشخصية سرية ولن تعرض لاي شخص من دون موافقة منك.

المشاركة في هذه الدراسة اختياري تماما ، ويمكنكم سحب الموافقة وانهاء المشاركة باشعار الباحث في اي وقت. اذا كانت لديكم اي اسئلة عن هذا البحث او بشأن حقكم ، اتصل بي علي هذا الرقم
0569363302

لقد كنت على علم تام الاجراء المذكور اعلاه واعطى الاذن للمشاركة في هذه الدراسة.

اسم : _____
التوقيع : _____
تاريخ : _____

APPENDIX G: The Frequency Histograms and the Normality Plots for Each Variable.

