

**UNIVERSITY STUDENT
SATISFACTION:
AN EMPIRICAL ANALYSIS**

**A thesis submitted in partial fulfilment
of the requirements for the
Degree of Master of Commerce and Management**

at

Lincoln University

by

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Lincoln University

2007

Abstract of a thesis submitted in partial fulfillment of the requirement

for the Degree of M. C. M.

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New Zealand's tertiary education sector has experienced political reform, social changes, economic changes and globalisation in the last two decades, and the sector has become more internationally competitive. DeShields, Kara, and Kaynak (2005) recommended that management of higher education should apply a market-oriented approach to sustain a competitive advantage. Therefore, understanding and managing students' satisfaction and their perceptions of service quality is important for university management if they are to design and implement a market-oriented approach.

The purpose of this research is to gain an empirical understanding of students' overall satisfaction in a university in New Zealand's higher education sector. A hierarchical model is used as a framework for the analysis. Fifteen hypotheses are formulated and tested to identify the dimensions of service quality as perceived by university students, to examine the relationship between students' overall satisfaction with influential factors such as tuition fees (price) and the university's image, and to determine the impact of students' overall satisfaction on favourable future behavioural intentions. In addition, students' perceptions of these constructs are compared using demographic factors such as gender, age, and ethnicity.

The findings of the study are based on the analysis of a sample of 223 students studying at Lincoln University. Support is found for the use of a hierarchical model and the primary dimensions; Interaction Quality, Physical Environment Quality, and Outcome Quality, as broad dimensions of service quality. Ten sub-dimensions of service quality, as perceived by

students, are identified. These are: Academic Staff, Administration Staff, Academic Staff Availability, Course Content, Library, Physically Appealing, Social Factors, Personal Development, Academic Development, and Career Opportunities. The results indicate that each of the primary dimensions vary in terms of their importance to overall perceived service quality, as do the sub-dimensions to the primary dimensions. In addition, the statistical results support a relationship between service quality and price; service quality, image, and satisfaction; and satisfaction and favourable future behavioural intentions. However, there is no statistical support for a relationship between price and satisfaction. The results also suggest that students' perceptions of the constructs are primarily influenced by their ethnicity and year of study.

The results of the analysis contribute to the service marketing theory by providing an empirically based insight into the satisfaction and service quality constructs in the New Zealand higher education sector. The study also provides a analytical framework for understanding the effects of the three primary dimensions on service quality and the effects of service quality on constructs including price, image, satisfaction, and favourable future behavioural intentions.

This study will assist management of higher education to develop and implement a market-oriented service strategy in order to achieve a high quality of service, enhance students' level of satisfaction and create favourable future behavioural intentions.

Key Words: Higher Education, Hierarchal Model, Student Satisfaction, Service Quality, Service Quality Dimensions, Behavioural Intentions.

Acknowledgements

This thesis reflects the contributions and support of many people. First and foremost, I would like to gratefully acknowledge the input, support and guidance from my main supervisor Mr. Michael D. Clemes. His patience, flexibility, energy, and insightful discussions were invaluable. Thank you to my associate supervisor, Dr. Christopher Gan, who provided valuable perspectives and guidance on this research at key times.

To my parents for their moral and financial support and their continuing encouragement throughout the hard times when I was staying away from home, I am much appreciative. My deep appreciation goes to Auntie Sarah, who provided much support throughout the years that I studied in New Zealand. To my family, a sincere thank you for all of their support and encouragement during my studies.

Finally, my special thanks go to all the individuals and postgraduate fellows in the Commerce Division. Their willingness to help and give advice on this research was much appreciated. I also greatly appreciate the support of the lecturing staff at Lincoln University who helped me distribute my questionnaire during their lecture periods.

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Chapter 1: Introduction

1.1 Problem Setting

Customer satisfaction has been positioned as a central issue in the marketing literature (Churchill and Suprenant, 1982). Academics and practitioners have studied and developed strategies to maintain strong relationships with customers, as satisfied customers usually results in customer retention and customer loyalty (Zeithaml, Parasuraman, and Berry, 1996).

One strategy is to offer high quality products and this strategy has been commonly deemed to be a competitive advantage that leads to success for many organisations (Sureshchander, Rajendran, and Anantharaman, 2002). Crosby (1991) maintains that providing a high level of quality lowers costs and retains satisfied customers, and ultimately generates higher profit margins for an organisation.

The service sector has grown immensely since 1970s, and this growth has attracted researchers and prompted them to study service quality and customer satisfaction issues in service industries (see Sureshchander et al, 2002; Rust and Oliver, 1994). However, because services exhibit several unique characteristics, identified as intangibility, inseparability, heterogeneity, perishability and lack of ownership (Clemes, Mollenkopf, and Burn, 2000), researchers have difficulty in defining and measuring service quality and customer satisfaction (Giese and Cote, 2000; Parasuraman, Zeithaml, and Berry, 1988).

Generally, the higher education sector has been increasingly recognised as an intangibly dominant service as the sector possesses all the unique characteristics of services (DeShields, Kara and Kaynak, 2005). The higher education sector has also faced reduced subsidies and intense global competition. In response, the sector has shifted its focus to market-oriented marketing mechanisms as have many other service industries (DeShields et al., 2005). The

higher education sector needs to continue strive to deliver a high quality of service and satisfy its participating customers to achieve sustainability in a competitive service environment (DeShields et al., 2005).

This chapter begins with a review of the higher education sector in New Zealand, states the objectives of the study, and finally assesses contributions that this study will make to the services marketing literature.

1.2 The New Zealand Higher Education Sector

New Zealand higher education sector has experienced major political reforms, social changes, and economic changes since the restructuring of the New Zealand economy in the mid 1980s (Clemes, Ozanne, and Tram, 2001).

The New Zealand tertiary education system has been through several reforms, the structural reforms of the 1980s, the institutional autonomy and academic freedom debates in the 1990s (Ministry of Education, 1997), and the present reform started in 2002 (Ministry of Education, 2004).

The 2002 reform began with implementation of the Tertiary Education Strategy 2002/07 (TES) comprised of six strategies that aim to create a more coherent and collaborative tertiary education system, ensure the system is better aligned to the nation's economic and social development goals, and is actively identifying and meeting the needs of the communities it serves (Ministry of Education, 2006).

In terms of social change, the participation rate of domestic students in tertiary education increased substantially, rising from 8.9 percent of the population in 1994 to 13.4 percent in 2003 (Ministry of Education, 2006). However, the increasing number of students has mainly

come from part-time and mature students aged over 25, and many of these students have been enrolled in private tertiary institutions (Ministry of Education, 2006). The full-time, full-year students¹ of all tertiary levels² of qualifications declined from 28 percent in 1998 to 19 percent in 2003 (Scott, 2005). The average age of tertiary students increased from 27.6 years in 1994 to 30.9 years in 2003, and the proportion of students aged less than 25 decreased from 51 percent to 38 percent over the same period (Ministry of Education, 2006). Moreover, the trend of gender participation rates also changed, female student enrollments have exceeded male student enrollments since 1993 (Ministry of Education, 1997). For example, 56.5 percent of all students enrolled in tertiary education organisations were female in 2004, up from 52 percent in 1994 (Ministry of Education, 2006).

The social changes that have accelerated since 2002 were partly influenced by economic changes that increased the number of part-time and mature students and acted to create more private tertiary institutions. There has been a dramatic increase in private tertiary institutions offering courses. For example, private institutions increased from 850 in 2001 to 888 in 2002 (Tertiary Sector Performance Analysis and Reporting, 2004).

The development of a free market economy also had a large impact on the type of programs offered by tertiary institutions (Clemes, et al., 2001). For example, business and employer groups have been reporting continuing skill shortages across a wide variety of business and occupational areas (Ministry of Education, 2006). In 2004, the highest proportion of students were enrolled in Management and Commerce degrees (20.6 percent of all students), and mixed field programmes (19.4 percent of all students). The students' selection of Management and Commerce degrees largely reflected the then current employment emphasis (Victoria University of Wellington, Department of Education, 1996). However, the increasing

¹ A full-time full-year student is defined as someone whose combined EFTS use for a year is 1.0 EFTS or more. This excludes those full-time students who study for part of the year.

² Tertiary Levels including :Certificate, Diploma, Bachelors, Honours, Postgrad Cert/Dip, Masters, and Doctorate Degrees

popularity of the mixed field programmes also suggests that New Zealand was in the process of moving to a broader knowledge-based economy and society (Tertiary Sector Performance Analysis and Reporting, 2004).

There has also been considerable growth in education provided for international students. The education sector has become the third largest export service industry in the services sector and education generated approximately NZ\$2.2 billion in 2004 (Ministry of Education, 2005).

Despite the drop in the international students during the Asian economic downturn in 1997, the number of foreign fee-paying students participating in public tertiary institutions increased by 295 percent, from 3,199 in 1994 to 12,649 in 2001 (International Policy and Development Unit, 2002). In 2004, there were 29,051 foreign fee-paying students studying in public tertiary institutions, a 908.1 percent growth from 1994 (Ministry of Education, 2005).

The recent political reforms, social changes, economic changes, and globalisation have prompted the New Zealand higher education sector to become more internationally competitive. The higher education sector is seeking ardently marketing strategies to succeed in the marketplace, and DeShields et al. (2005) recommended that higher education management should apply market-oriented principles and strategies that are used in profit-making institutions. Therefore, the approaches to enhance perceived service quality and customer satisfaction that are normally adopted in other service industries have also attracted the interest of higher education management (Ford, Joseph, and Joseph, 1999).

1.3 Research Purpose

Clemes et al. (2001) empirically investigated students' perceptions of service quality in the higher education sector in New Zealand. The research implication was that the perceptions of service quality varied significantly among students of different ages, different ethnic backgrounds and those studying different courses.

The purpose of this research is to gain an empirical understanding of students' overall satisfaction in a university in New Zealand's higher education sector. In particular, this research will identify the dimensions of service quality as perceived by university students. The relationship between students' overall satisfaction with influential factors such as tuition fees (prices), and university's image is also examined. In addition, students' overall satisfaction will be compared using demographic factors such as gender, age, and ethnicity. Finally, the impact of students' overall satisfaction on favourable future behavioural intentions will be analysed.

This research uses a hierarchical model structure proposed by Brady and Cronin (2001) as a framework. The research has five main objectives:

- (1) To identify the service quality dimensions as perceived by students in the New Zealand higher education sector.
- (2) To determine the effects of the dimensions of perceived service quality and other influential factors on students' overall satisfaction.
- (3) To examine the relationship of students' overall satisfaction with favourable future behavioural intentions.
- (4) To identify the least and most important service quality dimensions as perceived by students in higher education in New Zealand.
- (5) To examine the effects of demographic factors on students' satisfaction and related constructs.

1.4 Contribution of Research

By satisfying these objectives this study will contribute to the marketing literature from both an academic and practical perspective. First, this study will contribute to the marketing literature by providing an examination of several services marketing constructs. This is an

important contribution as it should provide an improved understanding of student perceptions of: service quality, satisfaction, influential factors, and favourable future behavioural intentions.

Second, this study will benefit marketers and practitioners in the New Zealand higher education sector. The research findings will provide practical information about what students of different ethnic backgrounds consider important in their evaluation of service quality, and the effect that ethnicity has on other important constructs. These findings are important as they may assist higher education marketers and practitioners in developing and implementing services marketing strategies to ensure a high quality of service and enhance student satisfaction. Higher levels of satisfaction should increase favourable future behavioural intentions.

1.5 Thesis Overview

This study consists of six chapters in order to meet the research objectives outlined in Section 1.3.

Chapter Two reviews the customer satisfaction and service quality literature, the empirical research in the higher education sector, and the literature on influential factors and favourable future behavioural intentions. Chapter Three presents the conceptual model based on the findings of the literature review undertaken Chapter Two and develops several hypotheses. Chapter Four details the methodology used to test the hypotheses. Chapter Five presents and discusses the results of the analysis undertaken in this study. Lastly, Chapter Six offers conclusions and recommendations based on the results and discussions presented in Chapter Five.

Chapter 2: Literature Review

2.1 Chapter Introduction

This chapter examines the relevant literature on satisfaction and the constructs such as service quality, image and price that may impact on an individual's satisfaction. The chapter begins with defining and reviewing the disconfirmation paradigm. Section 2.3, 2.4 and 2.5 examine the relevant literature regarding the conceptualisation and measurement of service quality. Section 2.6 presents an overview of the literature specific to service quality and satisfaction in the higher education sector. Section 2.7 discusses the relationship between satisfaction and service quality and relates these constructs to favourable future behavioural intentions, and then examines other factors such as image/reputation and price that may impact on student satisfaction.

2.2 Customer Satisfaction

Since Cardozo (1965) proposed that the concept of customer satisfaction was an important marketing activity outcome, numerous researchers have attempted to develop a consensus definition of the construct (Giese and Cote, 2000). Customer satisfaction was traditionally conceptualised as a cognitive construct (Westbrook, 1987), but others have argued that customer satisfaction was involved in customers' affective responses (Yi, 1990).

Hunt (1977) described customer satisfaction as stepping away from an experience and evaluating it.

“The evaluation rendered that the [consumption] experience was at least as good as it was supposed to be” (p.459).

Oliver (1981) suggested that customer satisfaction was an evaluation of the surprise inherent

in a product acquisition and/or consumption experience.

“The summary psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with the consumer’s prior feelings about consumption experiences” (p. 27).

These two definitions emphasized the evaluative process, however, other researchers recommended viewing customer satisfaction as the response to an evaluative process (Giese and Cote, 2000).

For example,

“The consumer’s response to the evaluation of the perceived discrepancy between prior expectations (or some norm of performance) and the actual performance of the product (or service) as perceived after its consumption” (Tse and Wilton, 1988, p. 204).

“[Product satisfaction] is an attitude – like post consumption evaluative judgment” (Mano and Oliver 1993, p. 454).

Drawing from these definitions, customer satisfaction was viewed as a summary of emotional and cognitive responses (Rust and Oliver, 1994) that pertained to a particular focus (expectations, product/service, or consumption experience) and occurred at a particular time (after consumption, after choice, or accumulative experiences) (Giese and Cote, 2000).

2.2.1 Disconfirmation Paradigm

The vast majority of the customer satisfaction literature has been based on the disconfirmation paradigm, these studies have used some variant of the disconfirmation paradigm which holds that satisfaction is related to the size and direction of the disconfirmation experience, where disconfirmation is related to the person’s initial expectations (see Oliver, 1993, 1981; Yi, 1990; Churchill and Suprenant, 1982).

Churchill and Suprenant (1982) highlighted that the full disconfirmation paradigm encompassed four constructs, expectations, performance, disconfirmation and satisfaction. Expectations reflected customers' pre-consumption perception associated with goods or services (Barsky, 1992), or anticipated performance (Churchill and Suprenant, 1982), performance represented customers' perception of actual performance of goods or services (Oliver, 1993), disconfirmation arose from discrepancies between prior expectations and actual performance, and satisfaction was described as an outcome of purchase and use resulting from the buyer's comparison of the rewards and costs of purchase in relation to the anticipated consequences (Churchill and Suprenant, 1982).

The relation between the four constructs was that expectations and the performance directly affected the satisfaction, or indirectly, via subjective disconfirmation (Oliver, 1980; Tse and Wilton, 1988). Disconfirmation occupied a central position as a crucial intervening variable on customer satisfaction (Churchill and Suprenant, 1982). The operation of disconfirmation in influencing satisfaction is generally seen as two processes consisting of forming expectations and a comparison of those expectations against the outcome (Rust and Oliver, 1994).

The satisfaction level depended on the level of disconfirmation which ranged from negative disconfirmation, confirmation, and positive disconfirmation. More specifically, negative disconfirmation occurred when the good or service was more poorly performed than expected (Churchill and Suprenant, 1982), or when customers had exceedingly high expectation levels that the performance was unable to match. Confirmation was when goods or services performed as expected, and customers would likely to be neither satisfied nor dissatisfied. Lastly, positive disconfirmation happened when the performance of goods or services was better than expected and favoured a satisfactory experience (Churchill and Suprenant, 1982).

The concept of disconfirmation was also widely recognised and has been adopted to conceptualise service quality (discussed in Section 2.4). The following section overviews the early foundations of service and the service quality construct.

2.3 An Overview of Services in Marketing

2.3.1 The Foundation of Services

Traditionally, the marketing literature has fundamentally focused on the manufacturing industry that produces tangible goods (Gronroos, 1978). The concept of service was ignored, researchers and practitioners considered that services were indifferent from goods except for intangibility (Shostack, 1977). Therefore, many service firms adopted marketing planning that was originally designed for physical goods (Shostack, 1977). However, Gronroos (1978) suggested that services should not be treated as physical goods and that intangible services required new market planning and market mix concepts.

Following this contention, the early services marketing literature concentrated on differentiating services from goods (see Lovelock, 1983, 1981; Shostack, 1977). Shostack (1977) emphasised that there were rarely pure goods or pure services, Lovelock (1983) classified services with regard to their people/things involvement and tangible/intangible actions. Rathmell (1966) distinguished goods from services and described thirteen distinct characteristics. The literature commonly identifies five distinct characteristics that differentiate services from goods: intangibility, inseparability, heterogeneity, perishability and lack of ownership, summarised in Clemes et al. (2000).

2.3.2 Service Quality

Parasuraman et al., (1985) and Rust, Zahorik and Keiningham, (1995) recognised quality was as a competitive advantage for an organisation's success and survival, and that quality products and services delight customers and lead to organisational growth. However, the

interest in quality management in the service sector was estimated to have started sixty years later than in the goods sector (Gummesson, 1991). Hence, the comprehensive goods quality literature combined with the customer satisfaction literature, have contributed to the foundation of early service quality theory (Parasuraman et al., 1988, 1985; Gronroos, 1984, 1982).

Quality was traditionally defined as 'conformance to specifications' (Crosby, 1979). In the goods sector, research into quality focused on measuring the costs of quality defects and managing quality through several systematic approaches that were associated with prevention, appraisal, and failure (Alahassane, Zafar, and Curtis, 1995). This perspective of quality was primarily technology driven and product oriented (Gummesson, 1991), or often referred to as 'objective quality' (Garvin, 1983).

However, several researchers claimed that 'objective quality' only conformed to manufacturers' specifications and that it did not necessarily correspond to conformance of customers' specifications (Steenkamp, 1989). Jacoby, Olson and Haddock (1971) contended that customers used cues to form their impressions of quality, regardless of product's actual quality. Similarly, Gilmour (1977) found that customers' purchasing behaviour was related more to perceived product characteristics than to actual performance characteristics.

Researchers recognised that customers' specifications were also essential; in fact, Gummesson (1991) suggested that manufacturers would be in danger if they did not understand quality as perceived by customers. This was primarily because customers' expectations often cannot be anticipated by manufacturers (Zeithaml, 1988).

Service quality was viewed as subjective in nature, and commonly referred to as 'perceived service quality' in the service sector (Rust and Oliver, 1994). Shostack (1977) contended that

the reality of services to customers must be defined experientially, rather than in engineering terms. Similarly, Oliver (1993) and Olshavsky (1985) found that customers evoke different subsets of attributes to infer quality in different situation. Further, the dissimilarities to goods make the evaluations of services not possible if customers relied only on the previous dimensions of goods quality (Parasuraman et al., 1985).

Several pioneers of service quality research have described service quality as an elusive and indistinct construct (Cronin and Taylor, 1992; Carman, 1990; Parasuraman et al., 1985).

Services have been observed as only existing during the time they are rendered (Shostack, 1977), and that evaluations of service quality involve both processes of service delivery and outcomes of services (Gronroos, 1982).

Parasuraman et al. (1985) defined perceived service quality as a form of attitude, related to but not equivalent to satisfaction, resulting from a comparison of expectations with perceptions of performance. Service quality was interpreted as an enduring global attitude, while satisfaction was related to a specific transaction (Carman, 1990). Carman (1990) cautioned that calling quality an attitude was not a common practice among researchers. However, Cronin and Taylor (1992) argued that service quality was best conceptualised and measured as an attitude.

The complexity in conceptualising and measuring service quality has been deemed to be one of the most debated and controversial topics in service marketing (Brady and Cronin, 2001). Parasuraman et al. (1985) concluded that service quality was more difficult for customers to evaluate than goods quality. However, service quality was seen as increasingly important in both the goods and services sectors, and the need to effectively manage service quality was recognised. Therefore, an improved understanding of customers' perceptions of service quality was deemed to be required (Rust and Oliver, 1994).

The following section reviews seminal conceptualisations of service quality and the corresponding conceptual models developed.

2.4 Service Quality Models

Many studies on service quality have attempted to conceptualise the construct and develop a corresponding model (see Gronroos, 1984, 1982; Parasuraman et al., 1988, 1985). One of the most recent service quality models developed by Brady and Cronin (2001) was integrated from a two-dimensional, three-dimensional, and five-dimensional structure, to a multi-dimensional structure. The following section presents a review of service quality models.

2.4.1 The Perceived Service Quality Model

Gronroos (1984, 1982) was one of the first scholars to conceptualise service quality.

Gronroos's (1982) perceived service quality model (Figure 2.1) was based on the disconfirmation paradigm (Churchill and Suprenant, 1982). In his model, service quality was defined as "the result of a comparison between customer's expectation, and his/her real-life experiences with the services" (Gronroos, 1984). Gronroos (1982) also suggested that functional and technical quality were the two most important dimensions of service quality.

Technical quality referred to the outcome of the production process, or what the customer receives in a customer encounter. For example, if an insurance claim is settled to the customers' satisfaction then the outcome of the claims handling process results in good technical quality.

Functional quality referred to the interaction between buyer and seller, that is, how the service is delivered. For example, if the claims handling process is poor from the customers' view point then the functional quality will be low (Gronroos, 1982).

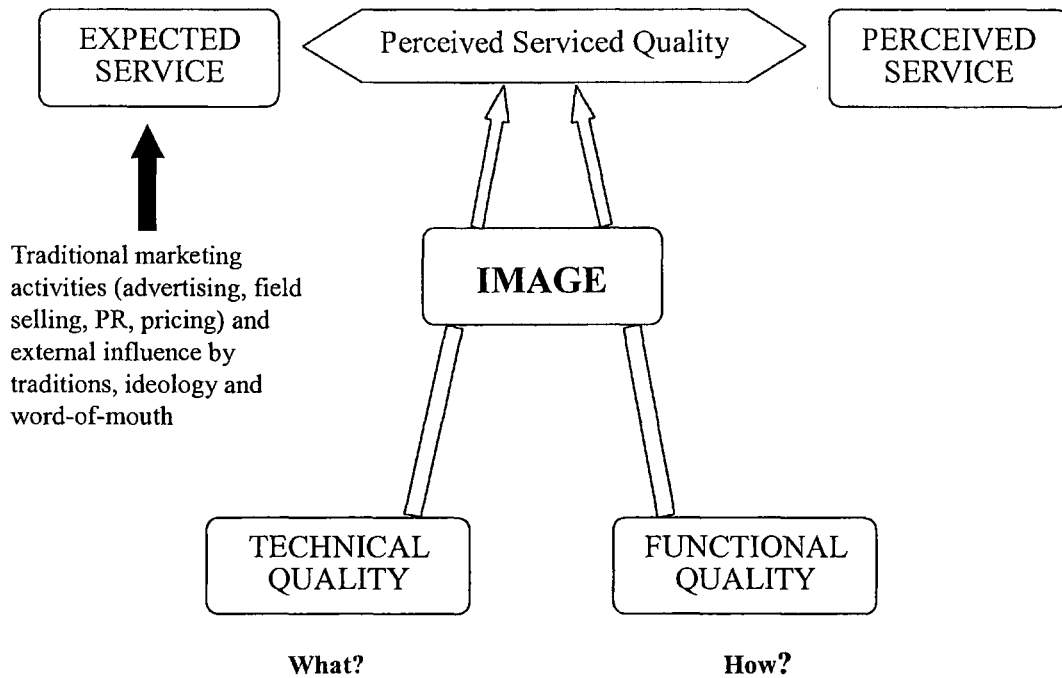


Figure 2.1: Perceived Service Quality Model (Gronroos, 1984; p. 40).

2.4.2 The SERVQUAL Model

Parasuraman, et al.'s (1988, 1985) also employed the disconfirmation paradigm as a basis to conceptualise their SERVQUAL model (Figure 2.2). They contend that there is a gap between customer's expectation and perception of the service performance, and that the level of perceived service quality is dependent on the magnitude of the gap. The smaller the gap, the higher the level of perceived service quality.

Distinct from Gronroos' (1984, 1982) two dimensional service quality model (technical and functional), Parasuraman et al. (1985) initially evaluated ten service quality dimensions (determinants) and in a later study consolidated them into five dimensions (Parasuraman et al., 1988). These five dimensions are:

Tangibility: Physical facilities, equipment, and appearance of personnel.

Reliability: Ability to perform the promised service dependably and accurately.

Assurance: Knowledge and courtesy of employees and their ability to inspire trust and confidence.

Empathy: Caring, individualized attention the firm provides its customers.

Responsiveness: Willingness to help customers and provide prompt service. (Parasuraman et al., 1988; p. 23).

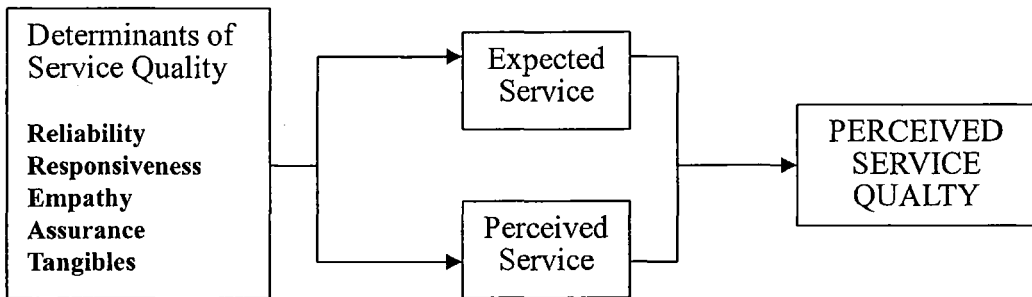


Figure 2.2: Determinants of Perceived Service Quality (Parasuraman et al., 1988).

2.4.3 The Three-Component Model

Rust and Oliver (1994) recognised that the two dimensions in Gronroos (1984, 1982) service quality model were critical; however, they suggested another important dimension underlying service quality. Therefore, Rust and Oliver's (1994) proposed a three-component model, consisting of the service product (technical quality), the service delivery (functional quality), and the service environment (Figure 2.3).

Rust and Oliver's (1994) conceptualised model was empirically validated by McDougall and Levesque (1994), and by McAlexander, Kaldenberg, and Koenig (1994) and these authors confirmed the existence of the three components in retail banking and health care respectively.

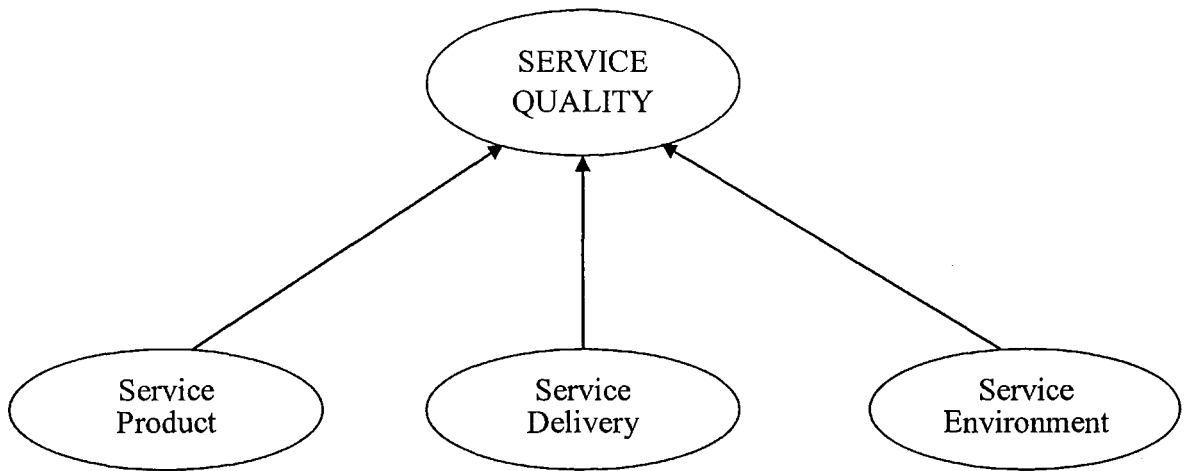


Figure 2.3: Three-Component Model (Rust and Oliver, 1994)

2.4.4 The Retail Environment Multilevel Model

Drawing from an extensive review of the past literature on quality, Dabholkar, Thorpe, and Rentz (1996) argued that the SERVQUAL model would be inappropriate in a retail environment. Dabholkar et al. (1996) developed a hierarchical model (Figure 2.4) that involved multi facets and dimensions of service quality.

Dalbhokar et al.'s (1996) model comprised three levels, the highest order measures customers' overall perception of service quality, the second order consists of five basic dimensions, and the third order consists of the sub-dimensions.

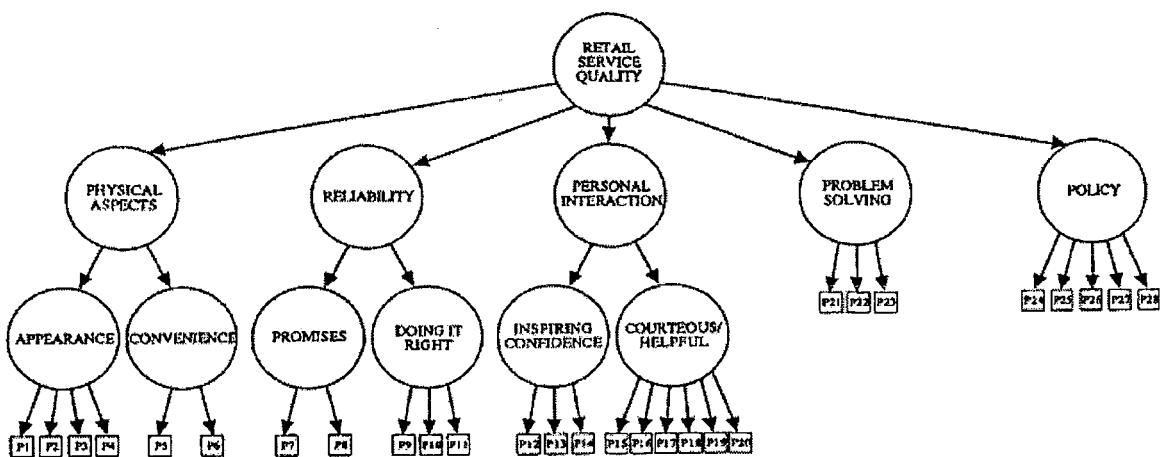


Figure 2.4: Retail Environment Multilevel Model (Dabholkar et al., 1996).

2.4.5 The Service Environment Hierarchical Model

Brady and Cronin (2001) suggested that Dabholkar et al.'s (1996) hierarchical structure model was not only applicable in a retail service environment, but it could also be applied to other service industries. Brady and Cronin (2001) investigated and enhanced the model to make it more relevant in generic service industries (Figure 2.5).

Firstly, they agreed with Rust and Oliver's (1994) view that the overall perception of service quality was based on a customer's evaluation of three dimensions of the service encounter (1) the service-employee interaction (i.e. functional quality (Gronroos, 1984, 1982)), (2) the service environment (i.e. servicescapes (Bitner, 1992)), and (3) the outcome (i.e. technical quality (Gronroos, 1984, 1982)).

The dimensions are incorporated into three primary dimensions of perceived service quality. Brady and Cronin (2001) termed the dimensions as (1) interaction quality, (2) physical environment quality and (3) outcome quality.

The next level in the Brady and Cronin's model (2001) is formed by nine distinct sub-dimensions that are divided evenly between the three primary dimensions. The nine sub-dimensions aggregate to form a perception on each of the three primary dimensions, and perceptions of the primary dimensions ultimately combine to form an overall service quality perception.

Brady and Cronin (2001) proposed that customers evaluated the sub-dimensions in terms of the reliability, responsiveness, and empathy (Parasuraman et al., 1988) of the service performance (see Figure 2.5).

Empirical evidences supported Brady and Cronin's (2001) conceptualised model based on four service industries, fast food, photograph developing, amusement parks, and dry cleaning.

A replication study (Liu, 2005) based on fast food restaurants, gasoline stations, medical clinics, photo shops, mobile phone repair shops and 24-hour grocery stores also confirmed the hierarchical nature of perceived service quality suggested Brady and Cronin (2001). Collins (2005) used the hierarchical structure as a framework to research spectator satisfaction in professional sports and found empirical support a hierarchical structure.

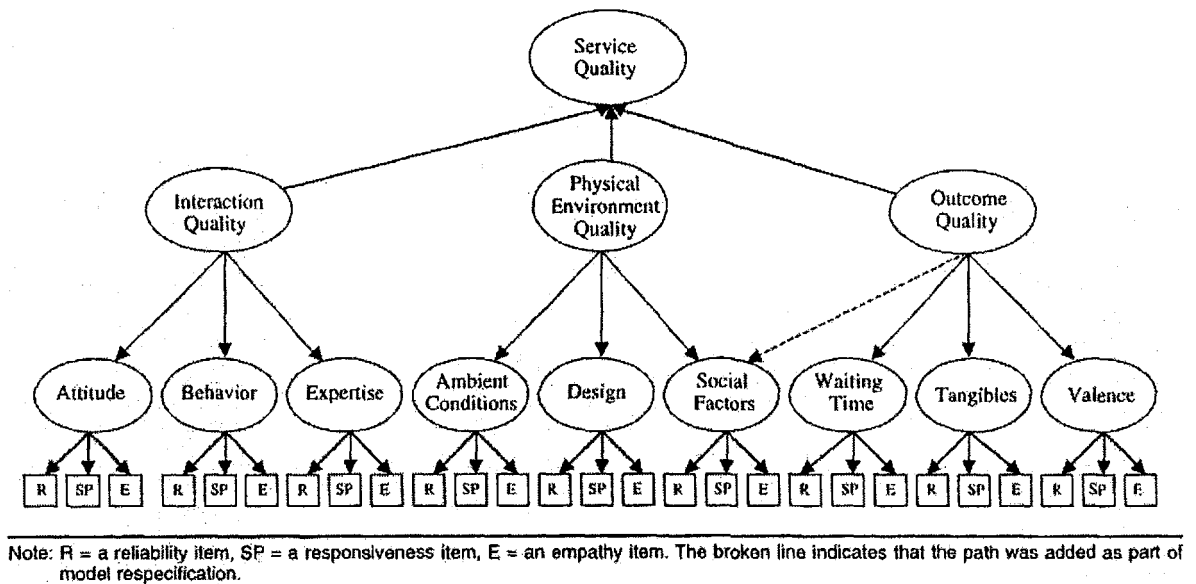


Figure 2.5: Service Environment Hierarchical Model (Brady and Cronin, 2001).

The next section will discuss the measurement of service quality and the critiques of the SERVQUAL instrument.

2.5 The Service Quality Measurements

2.5.1 SERVQUAL Scale

The SERVQUAL instrument was developed by Parasuraman et al. in 1985 and refined in 1988, the function of the instrument was to measure customers' perception of service quality. The instrument was conformed to fit Pararuraman's et al. (1985) conceptual model of service quality (discussed in Section 2.4.2) where perceived service quality is formed by a comparison of customers' expectations and performance.

In the original instrument, expectations were assessed using 22 items and by asking customers what they expected from a specific organisation. Similarly, performance was also assessed using 22 items and asking customers to evaluate the service performed by the specific organisation. The items were measured seven point Likert scale to represent the extent of agreement and the extent of disagreement.

The 22 pairs of items represented five dimensions; tangibles, responsiveness and assurance dimensions have four items each; and the remaining two dimensions, reliability and empathy have five items each. Reliability was found to be most important amongst all of the dimensions (Parasuraman et al., 1988).

Parasuraman et al. (1988, 1985) asserted that the SERVQUAL instrument could be generalised to most of the service organisations as their empirical results based on five different service industries exhibited good reliability and validity. Further, they maintained that the instrument was insightful if the purpose of the research was to diagnose service shortfalls accurately (Parasuraman et al., 1994).

2.5.1.1 Critique of the SERVQUAL Scale

Although SERVQUAL is extensively used and frequently cited across a range of service organisations, considerable criticisms have also been raised questioning its reliability and validity (Cronin and Taylor, 1994, 1992; Babakus and Boller, 1992; Carman, 1990).

Buttle (1996) grouped the criticisms into theoretical and operational issues.

The theoretical issues include:

(1) Gap model- there is little evidence that customers assess service quality in terms of performance minus expectation gaps; (2) process orientation- SERVQUAL focuses on the process of service delivery, not on the outcomes of the service encounter; and (3) dimensionality- SERVQUAL's five dimensions are not universal- the number of dimensions

comprising service quality is contextualised; items do not always load on the factors that one would a priori expect; and there is a high degree of intercorrelation between the five dimensions (Buttle, 1996).

The operational issues include:

(1) Expectations- the term expectation is polymeric; consumers use standards other than expectations to evaluate service quality (SQ); and SERVQUAL fails to measure absolute SQ expectations; (2) item composition- four or five items can not capture the variability within each SQ dimension; (3) two administrations- two administrations of the instrument causes boredom and confusion; (4) variance extracted: the over SERVQUAL score accounts for a disappointing proportion of item variances (Buttle, 1996).

As a result of these criticisms, researchers have developed alternative approaches with the objective being able to improve the measurement of service quality (Cronin and Taylor, 1992).

2.5.2 Performance-based Measures (SERVPREF)

Cronin and Taylor (1992) suggested that SERVQUAL is inadequate; alternatively, they introduced the SERVPREF instrument to measure service quality. The major difference between the two approaches is that SERVQUAL utilises a disconfirmation paradigm whereas SERVPREF utilises an attitudinal paradigm.

Cronin and Taylor (1992) defined service quality as a long-term attitude, and suggested that it would be inappropriate to include an expectation construct in the measure. Therefore, perceived service quality is considered purely as a performance-based construct and only customers' perception of performance by an organisation are measured.

Cronin and Taylor's (1992) empirical results suggested that SERVPREF exerted better

predictability of customers' responses of the service quality delivered by an organisation than SERVQUAL. Parasuraman et al. (1994) defended the inclusion of expectations and maintained it would be more favorable as a construct for practitioners because the superior diagnostic value of SERVQUAL more than offsets the instruments loss of predictive power.

However, Zeithaml, Berry and Parasuraman (1996) later conceded that the perceptions only measurement was more appropriate if the primary purpose of research was an attempt to explain the variance in a dependent construct. Therefore, several studies have excluded the expectation construct when measuring service quality (Bigne, Moliner, and Sanchez, 2003; Brady and Cronin, 2001; Clemes et al., 2001).

2.6 Service Quality/Satisfaction Studies in the Higher Education Sector

Fundamental approaches to service quality and satisfaction measurement in higher education concentrate on teaching quality, for example, Students' Evaluation of Teaching Effectiveness (SETE) (Guolla, 1999). Fundamental approaches are primarily involved with the teaching side of the experience, however, the student experience involves more than just teaching and learning (Cuthbert, 1996a), and it is rational to include aspects of the service environment to evaluate total student experience (Souter and McNeil, 1996).

Education researchers have frequently utilised modified SERVQUAL (Parasuraman et al., 1988) and SERVPREF (Cronin and Taylor, 1992) instruments, and they have included physical environment aspects to examine overall students' perception of service quality (see Bigne et al., 2003; Athiyaman, 1997; Cuthbert, 1996a).

It is important to know that the higher education literature, the definition of quality predominantly focuses on the assessment of outcomes (Ewell, 1994). Outcomes are the consequences or results associated with instructional experiences; the *end* results of

institutional, program, or curricular goals (Anderson, Moore, Anaya, and Bird, 2005).

Assessing students' outcomes often requires asking students what they are able to do after they complete their studies (Anderson et al., 2005), or measuring the knowledge, skills and abilities the students have attained (Gardiner, Anderson, and Cambridge, 1997) after instructional experiences. The College Student Experiences Questionnaire (CESQ) developed by Pace and Kur (1998) has encompassed the estimate of gains when measuring outcomes of students' university or college experiences (Segar, 2001). Therefore, the estimate of gains by students may be viewed as the outcome dimension of service quality when students' university experiences are evaluated.

The following sections present an overview of the empirical studies conducted on service quality and/or satisfaction in major higher education settings, including North America, Europe, and Australasia, and cross-cultural studies that involved the United States and New Zealand, and the United States and the United Kingdom.

2.6.1 North America

Guolla (1999) applied the SEEQ (Students' Evaluation of Educational Quality) instrument to examine students' course satisfaction and instructor satisfaction. Seven dimensions were identified; learning, enthusiasm, organisation, interaction, rapport, assignments and materials.

Guolla (1999) sampled undergraduate and MBA students. In both samples, most of the dimensions were found to have a positive and significant relationship with course and instructor satisfaction. The learning dimension was found to have the greatest impact when evaluating course satisfaction; and enthusiasm was most important when measuring instructor satisfaction. For MBA students, the rapport dimension had a significant negative relationship with course and instructor satisfaction. On the other hand, the undergraduate students' sample showed neither the organisation, nor the interaction dimension, maintained a positive

significant relationship with the course and instructor dimension.

DeShields et al. (2005) investigated the determinants of student satisfaction. The authors argued that faculty performance, advising staff, and classes were the most important variables that influenced students' college experience, and ultimately satisfaction (defined as perceived service performance) and retention.

DeShields et al.'s, (2005) results suggested that faculty performance and classes had a positive and significant relationship with student partial experience and advising staff had a positive but insignificant relationship with student partial experience. Analysis of means also indicated student partial experience was positively related to student level of satisfaction.

The authors contend that the positive insignificant relationship between advising staff and student partial experience cannot be interpreted as student dissatisfaction since students may not perceive that the advising staff performance is directly related to expected outcomes from a college experience. They imply that the interaction quality (faculty) is positively related to the outcome quality (student partial experience) and will ultimately influence student satisfaction.

Segar (2001) conducted a survey in Elizabethtown College and used the College Student Experiences Questionnaire (CSEQ) developed by Pace and Kuh (1998) as the measurement instrument. The CSEQ covered thirteen Quality of Effort dimensions including 'art, music, theater', 'campus facilities', 'clubs and organisations', 'computer and information technology', 'course learning', 'experiences with faculty, 'information in conversations', 'library', 'personal experiences', 'scientific and quantitative experiences', 'student acquaintances' and 'writing experiences'. Furthermore, a total of thirty-five gain estimates related to the quality of effort dimensions and college live decision objectives were broadly classified into intellectual, social, personal, moral, and vocational growth aspects. Examples of the gains include: 'developing the ability to function as a member of a team', 'gaining a

range of information that may be relevant to a career, understanding yourself, your abilities, interests, and personality’.

Segar (2001) reported that students rated highest those gains that related to personal, interpersonal, technical, and vocational gains. Segar’s (2001) results showed that the estimates of relationships with other students rated the highest, and also was the single strongest predictor of college satisfaction. Alternatively, estimates on administrative personnel rated as the lowest predictor of college satisfaction.

2.6.2 Europe

Cuthbert (1996a) reviewed several techniques measuring student experience and pointed out that these approaches only covered the teaching side of the experience. The author argued that a modified SERVQUAL instrument may be applicable in a higher education context because it might be able to encompass the whole student experience.

Two sets of questionnaire were constructed; one was referred to students’ expectation of general university, and the other referred to their experience in Manchester Metropolitan University. The study results implied that staff and their relationship with students would override other dimensions such as computer facilities, library, and sports facilities when measuring the overall level of perceived service quality. Cuthbert (1996b) also concluded that the SERVQUAL instrument (Parasuraman et al., 1988) may not be appropriate for measuring service quality in higher education.

Oldfield and Baron (2000) studied students’ perceptions of service quality of the Management Faculty at a university in the United Kingdom. The authors adapted a modified SERVPREF instrument to measure students’ perceptions of service quality. They contended that service quality in higher education must consider interpersonal and service delivery aspects, as well as the physical elements of their educational experiences in lecture rooms, libraries, and computer rooms. However, the empirical results showed three factors of service quality are;

requisite, acceptable, and functional. Requisite factors represented those items that are essential to enable students to fill their study obligations. Acceptable factors represented those items that students acknowledge as being desirable but not essential during their course of study. Lastly, Function factors represented those items of a practical or utilitarian nature (Oldfield and Baron, 2000).

Bigne et al. (2003) examined the multi-service public services, including university experience, in Spain. The SERVPREF instrument (Cronin and Taylor, 1992) was used as a reference to determine the perceptions of quality in the core service (teaching quality). Only one item per dimension (tangibility, reliability, responsiveness, confidence and empathy) was used to determine the perceptions of the peripheral services (library quality, information attention quality, and registration quality).

Bigne et al. (2003) used conjoint analysis to examine the relationships between perceptions of service quality (both core and peripheral) and overall university quality to determine overall student satisfaction. The authors' conclusion was that the perception of core service quality was dominant for overall quality, but that the perceptions of the peripheral service quality must not be neglected by universities.

2.6.3 Australasia

Soutar and McNeil (1996) examined students' expectations on perceptions of the academic and administrative service quality at a large Australia university. The SERVQUAL instrument was modified and used in Soutar and McNeil's (1996) study. The authors proposed communication, knowledge and availability were also important dimensions in a higher education setting and added these dimensions to the SERVQUAL instrument. Data was collected from three classes at the Australian university.

The authors found that students were satisfied with all eight quality dimensions of the academic section surveyed, especially with the tangible dimension. However, students

expressed dissatisfaction with the administrative section, especially the system dimension (parking facilities and enrollment procedures).

Athiyaman's (1997) research was set in a medium-sized university in Australia. Specifically, pre-enrollment and post-enrollment attitudes were surveyed. The first survey was conducted with new enrolling students in 1993, and a second survey in 1995, after the sample group of new enrolling students had experienced the university environment.

Eight services and service characteristics were identified to examine students' perception of university quality, (1) emphasis on teaching students well, (2) availability of staff for student consultation, (3) library services, (4) computing facilities, (5) recreational facilities, (6) class sizes (7) level and difficulty of subject content, and (8) student workload.

Athiyaman's (1997) results confirmed that satisfaction was a transaction-specific, short-term, overall attitude. The author also found that students' level of satisfaction and the perceptions of quality were a critical influence on behavioural intentions.

Clemes et al. (2001) conducted a research at Lincoln University in New Zealand. The authors integrated a conceptual model that was based on Gronroo's (1982) perceived service quality model. Further, the SERFPREF instrument was the frame of reference for the methodology the authors used to measure perceived service quality. Specifically, seven aspects (tangible aspects, competence, physical environment, attitude and behaviour, accessibility, reliability, and personal interaction) were identified under Gronroos' (1982) functional quality and technical quality dimensions.

Under functional quality, understanding the student, accessibility, and course process were significant. Under technical quality, the quality of education, the campus facilities, and the environment were significant. The library and laboratory aspects were insignificant. The research highlighted that age, course of study and ethnicity were characteristics that could also impact on the level of perceived service quality.

2.6.4 Cross-Cultural Research

A cross-cultural research study by Ford et al. (1999) compared the perceptions of service quality of undergraduate business students in New Zealand and the United States. Ford et al. (1999) argued that the importance-performance paradigm would be the most appropriate approach when measuring service quality in education.

There were seven dimensions identified, namely, programme issues, academic reputation, physical aspects/cost, career opportunities, location, time and others such as, university preferences influenced by family and friends and word-of-mouth communication.

The results of the rankings of the sub-dimensions exhibited cultural differences. Only the academic reputation (reputable degree, excellent instructor, and excellent academic facility) dimension was recognised as the most important by both cultural groups; the rankings of the other sub-dimensions did not correlate across cultures.

The authors found it difficult to generalise service quality across cultures and business sectors, and therefore, recommended that the sub-dimensions may be appropriate to measure service quality, but the service quality dimensions should be further developed for the specific culture and sector under investigation.

The objectives of Mai's (2005) cross-cultural research was to examine students' perceptions of education quality and identify the main factors affecting their perceptions. The samples were composed of students in the United States and in the United Kingdom. Mai (2005) proposed two hypotheses, the first was that the satisfaction level of students in United States was higher than the students in United Kingdom, the second proposed that there were associations between key service quality dimensions and overall satisfaction.

The author's questionnaire was based on the SERVQUAL methodology and was designed to quantify student perceptions. As a result, nineteen independent variables were used to express the overall level of satisfaction. For example, 'lecturers' expertise in their subject area', and

'lecturers' willingness to provide assistance in academic related areas'.

The results showed that students in the United Kingdom were less satisfied than students in the United States. The result supported the first hypothesis. Furthermore, the results also indicated only general satisfaction among students (less than very satisfied), and that 'lecturer's interest in the subject matter' rated the highest among all education services. Pearson's Correlations showed fifteen of seventeen variables were significantly correlated. 'Overall impression of the school' and 'overall impression of the quality of education' showed a particularly strong influence on the prediction of overall satisfaction. The research also indicated that overseas students expressed lower levels of overall satisfaction than domestic students.

The following section will examine the relationships between important constructs such as customer satisfaction, service quality, price, image, and favourable future behavioural intentions.

2.7 Constructs Related to Service Quality

2.7.1 The Relationship between Satisfaction and Service Quality

Practitioners and marketers tend to use the term service quality and satisfaction interchangeably which has caused some difficulties when distinguishing the theoretical concepts of the two constructs and clarifying the causal direction of their relationships (Parasuraman et al., 1994). The underlying problem was that the service quality and satisfaction constructs have not been clearly defined and differentiated from each other (Iacobucci, Grayson and Omstorm, 1994). Parasuraman et al. (1988) defined service quality as a form of attitude, a long-run overall evaluation, whereas satisfaction was seen a transaction-specific measure. On the basis of this definition, perceived service quality was considered as a global measure, and therefore, the direction of causality was from satisfaction to service quality (Parasuraman et al., 1988).

Cronin and Taylor (1992) disagreed with Parasuraman et al.'s (1988) identification of a causal directional relationship between satisfaction and service quality. They argued that according to the satisfaction and attitude literature, attitude was a function of satisfaction, which means an individual's attitude accumulates to form their satisfaction (for example, see Oliver, 1981). Parasuraman et al.'s (1988) conceptualisation of service quality was not shared by Cronin and Taylor (1992). These authors argued that service quality was in fact an antecedent of satisfaction, the direction of causality was from service quality to satisfaction (Cronin and Taylor, 1992). Cronin and Taylor's (1992) empirical research that was based on four service industries supported their argument. Further, in regard to the effects of satisfaction and service quality on purchase intentions, Cronin and Taylor (1992) proved that both constructs would impact on purchase intentions but that satisfaction exerted a stronger and more consistent effect on purchase intentions than service quality. They reasoned that customers may not necessarily buy the highest quality service as convenience, price, or availability may enhance satisfaction and not affect customers' perceptions of service quality (Cronin and Taylor, 1992). Parasuraman et al. (1994) and Cronin and Taylor (1994) concurred that the causal directional relationship between satisfaction and service quality needed further study.

Iacobucci et al. (1994) presented an extensive review of the related literature and suggested that the constructs were connected in a number of ways: (1) they may be both different operationalisations of the same construct; (2) they may be orthogonally related, that is, they may be entirely different constructs; and (3) they may be conceptual cousins, their family connections may be dependent on a number of other considerations.

Fueling to the continuing debate on the relationship between service quality and satisfaction, an additional concept of satisfaction was formulated by Bitner and Hubbert (1994) when they introduced the concept of encounter satisfaction and advocated that it was distinct from

overall satisfaction and service quality.

Further, Sureshchandar et al. (2002) maintained that satisfaction possessed a multi-dimensional nature and they challenged that satisfaction should be operationalised along the same dimensions that constituted service quality. The authors determined that satisfaction and service quality were strongly correlated; however, they concluded that they were indeed two distinct constructs.

In endeavouring to clarify the specifications and the nature of the satisfaction and service quality constructs, Rust and Oliver (1994) proposed that service quality was only one of many dimensions on which satisfaction was based.

2.7.2 Price

Kotler (1972) originally described the main concept of marketing as a transaction in which there was an exchange of values between two parties. Doyle (1984), Hauser and Urban (1986) and Zeithaml (1988) agreed that the evaluation of value was a function of monetary and non-monetary costs, such as sacrifices associated with utilising the product/service and the benefits or utilities received in exchange. From this viewpoint, value was seen to be both situational and personal (LeBlanc and Nguyen, 1999). Edvardsson and Gustavsson (1991) maintained that an individual's value judgment was based on his/her background of social environment, society reference groups and past experiences.

Tellis and Gaeth (1990) defined the value construct in terms of customers' concerns with the quality received in comparison to the price paid for the product/service. Similarly, Edvardsson and Gustavsson (1991) and Zeithaml (1988) suggested that price must be considered when evaluating service quality. For example, when customers perceive price as being higher than it was they did not like their consumption experience, and the value assessment was rated as poor (Kiefer and Kelly, 1995).

Rust and Oliver (1994) showed that improving quality, or decreasing price may improve the service quality evaluation. In addition, Cronin et al., (2000) found that both service quality and value were significant predictors of satisfaction, and that satisfaction improved favourable future behavioural intentions.

2.7.3 Image

Image was viewed as the sum of beliefs, attitudes, and impressions that a person or group has an object (Barich and Kotler, 1991). On the organisational level, corporate image was described as the perceptions of an organisation reflected in the associations held in customers' memories (Keller, 1993).

Corporate image was seen as a result of an aggregate process by which the customers compare and contrast the various attributes of organisations (Nguyen and LeBlanc, 2001). Corporate image was consequently assumed to influence customers' purchase decision, especially when customers have a lack of knowledge about the services attributes (Andressen and Lindastad, 1998). Corporate image was believed to create a halo effect on customers' satisfaction judgments (Andressen and Lindastad, 1998).

It has been proposed that perceptions of image were built through a person's knowledge system (Andreasen and Lindastad, 1998). The knowledge system aroused from ideas, feelings, and previous experiences that the person retrieved from memory and transformed into mental images (Yuille and Catchpole, 1977).

In higher education, it is particularly the case, according to Gavin (as cited by Kotler and Fox, 1995) that:

An institution's actual quality is often less important than its prestige or reputation for quality, because it is a university's perceived excellence which, in fact, guides the decisions of

prospective students and scholars considering offers of employment.

Several empirical researchers have found that corporate image was an antecedent, or a mediator of constructs, regarding the evaluation of organisations and the services provided – perceived quality, perceived value, and loyalty, individually or together with satisfaction (Nguyen and LeBlanc, 1998; Andressen and Lindastad, 1998). Palacio, Menses and Perez's (2002) study that related to university image also empirically supported that corporate image had a significant relationship with image and student satisfaction.

2.7.4 Favourable Future Behavioural Intentions related to Service Quality and Satisfaction

Zeithaml et al. (1996) suggested that increasing customer retention or lowering the rate of customer defection was a major key to the ability of service providers to generate profits.

Some behaviour of customers signal the service provider whether they will remain or defect (Zeithaml et al., 1996). In particular, favourable future behavioural intentions signals customers' willingness to (1) say positive things about the organization; (2) recommend the organisation to other customers; (3) remain loyal to the organisation (that is, repurchase from it); (4) increase the volume of purchase; and (5) pay price premiums. Favourable future behavioural intentions have often been linked to improving service quality (Boulding, et al., 1993), increasing the level of satisfaction (Anderson and Sullivan, 1993), and having a positive effect on value (Zeithaml, 1988).

Boulding et al.'s (1993) study involved university students and identified strong links between service quality and favourable future behavioural intentions and their strategic importance to the university. The favourable future behavioural intentions included praising the university, planning to pledge to contribute money to the class upon graduation, and planning to recommend to an employer as a good place from which to recruit. Similarly, Athiyaman's

(1997) empirical study related to Australian university student experiences confirmed that related service quality and satisfaction related equally well to the favourable future behavioural intention construct.

2.8 Chapter Summary

This chapter presented the relevant literature regarding the conceptualisation and measurement of service quality, and the relationship of service quality to related constructs such a satisfaction, price, image and favourable future behavioural intentions. It also specifically overviewed the service quality and satisfaction literature in the higher education sector.

Chapter 3: Conceptual Gaps and Hypotheses

3.1 Introduction

This chapter discusses the conceptual gaps identified in the literature review discussed in Chapter Two. A conceptual model of student satisfaction is presented, and fifteen hypotheses proposed in this study are discussed. The proposed hypotheses will also address the following five research objectives:

- (1) To identify the service quality dimensions as perceived by students in the New Zealand higher education sector.
- (2) To determine the effects of the dimensions of perceived service quality and other influential factors on students' overall satisfaction.
- (3) To examine the relationship of students' overall satisfaction with favourable future behavioural intentions.
- (4) To identify the least and most important service quality dimensions as perceived by students in higher education in New Zealand.
- (5) To examine the effects of demographic factors on students' satisfaction and related constructs.

3.2 Conceptual Gaps

A review of the literature on service quality in higher education has identified five conceptual gaps. The first gap relates to a lack of published research with regard to students' perceptions of service quality in New Zealand. Although there is a body of perceived service quality and satisfaction literature related to higher education, the studies were mostly undertaken in the United States and Europe, and the findings may not pertain precisely to New Zealand as service quality is often characterised as industry specific or context specific (Ueltschy and

Krampf, 2001; Cronin and Taylor, 1994). In addition, cross-cultural studies on the higher education sector (see Section 2.6.4) suggest that students studying in different countries have different perceptions of service quality (Mai, 2005; Ford et al., 1999).

The second gap relates to a lack of published research in higher education with regard to the impact of influential factors such as image and price on service quality and satisfaction. This gap is important because an individual's perception is not determined solely by service quality, but also influenced by other factors (Zeithaml, 1988).

The third conceptual gap relates to a lack of published research in higher education and unifying theory regarding the relationship of service quality and satisfaction with favourable future behavioural intentions. This gap is important as encouraging favourable future behavioural intentions is perceived by many organisations as the ultimate goal to generate financial profits (Cronin, Brady, and Hult, 2000; Zeithaml et al., 1996).

The fourth gap relates to a lack of research pertaining to the service quality dimensions that students perceive to be more or less important. This gap is important as university management can be more confident that they are measuring the appropriate aspects of a university education as perceived by students.

The fifth gap relates to the effect of demographic characteristics on perceptions of service quality and satisfaction. In the higher education literature, researchers have suggested that the differences in service encounters are partly influenced by an individual's social and personal relationships (Clemes et al., 2001). However, there are few studies that reveal to what degree these demographic characteristics affect students' overall evaluation of service quality and satisfaction (Clemes et al., 2001).

3.3 Hypotheses Development

A hierarchical model has been developed for this study based on Brady and Cronin's (2001) multi-level structure model (see Figure 3.1). Information obtained from the literature review presented in Chapter 2 and from information gained in focus group interviews (see Section 4.5) has also been used to develop the hierarchical model.

The hierarchical model of service quality presented in Figure 3.1 suggests that students are expected to form perceptions on each of three primary dimensions; interaction quality, physical environment quality, and outcome quality in order to form an overall service quality perception. Students' perceptions of service quality are then assumed to influence both price and students' overall satisfaction. There are a total of fifteen hypotheses formulated, the first thirteen hypotheses are formulated to test each path in the model. The fourteenth hypothesis tests the relative importance of the service quality dimensions, and the last hypothesis is formulated to examine the differences in students' overall satisfaction based on demographic factors.

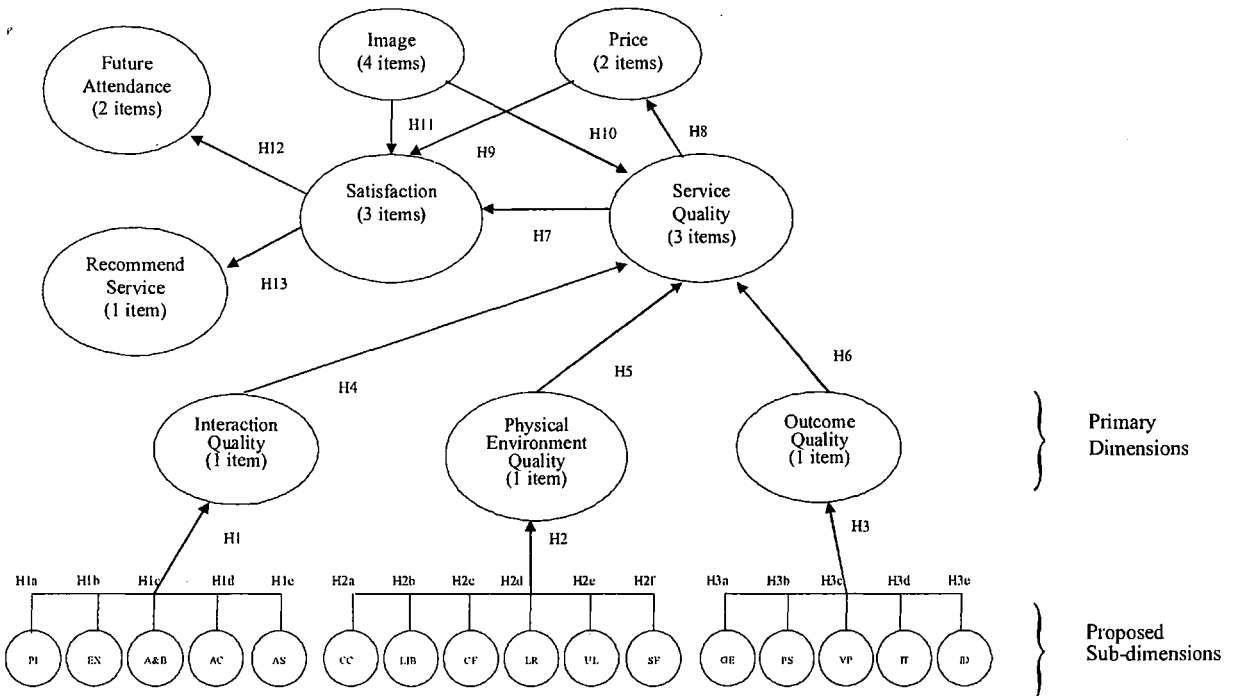


Figure 3.1: Student Satisfaction in Higher Education: A Conceptual Model.

3.3.1 Hypotheses Relating to Research Objective 1

Cronin and Taylor (1994) suggested that dimensional structures need to be confirmed for each research setting as customer satisfaction and service quality are found to be culturally sensitive (Ueltschy and Krampf, 2001; Ford et al., 1999). Therefore, the proposed set of sub-dimensions in Figure 3.1 will be specifically analysed for the New Zealand higher education sector based on a review of the literature, focus group interviews, and exploratory factor analysis.

Lovelock (1981) suggested that educational institutions were ‘people processing’ services and that institutions were highly involved with personal contacts and personal interactions. Thus, interaction quality involves teacher-student and staff-student relationships and is regarded as an important construct when measuring perceptions of higher education service quality (Oldfield and Baron, 2000; Guolla, 1999). Specifically, the proposed set of sub-dimensions that students evaluate as components of interaction quality are as follows:

- (a) Personal interaction (Mai, 2005; Bigne et al., 2003; Guolla, 1999);
- (b) Expertise (DeShields et al., 2005; Mai, 2005; Sahney and Karunes, 2004);
- (c) Attitudes and behaviour (Sahney and Karunes, 2004; Clemes et al., 2001);
- (d) Accessibility (DeShields, et al., 2005; Clemes et al., 2001; Athiyaman, 1997); and
- (e) Administration staff (Bigne et al., 2003; Souter and McNeil, 1996).

These sub-dimensions are expected to positively affect interaction quality; hence the first hypothesis is proposed:

H1: Higher perceptions of each interaction quality sub-dimension (H1a, H1b, H1c, H1d, and H1e) will positively affect interaction quality.

Students spend much of their time in contact with physical elements of their educational experiences, therefore, physical environment aspects is an important construct and must not be neglected when measuring perceptions of service quality (Oldfield and Baron, 2000;

Cuthbert, 1996). The literature reveals the following common sub-dimensions that are components of physical environment quality:

- (a) Course content (Mustafa and Chiang, 2006; Athyiaman, 1997);
- (b) Library facilities (Oldfield and Baron, 2000; Athyiaman, 1997);
- (c) Computer room facilities (Mai, 2005; Athyiaman, 1997);
- (d) Lecture room facilities (Clemes et al., 2001; Oldfield and Baron, 2000)
- (e) University layouts (Ford et al., 1999); and
- (f) Social factors (Brady and Cronin, 2001).

Higher perceptions of these sub-dimensions are expected to positively affect physical environment quality; hence the second hypothesis is proposed:

H2: Higher perceptions of each physical environment quality sub-dimension (H2a, H2b, H2c, H2d, H2e, and H2f) will positively affect physical environment quality.

Outcome quality (teaching and learning outcomes) relates to the consequences and results of what students' have gained in their educational experiences (Anderson et al., 2005). Outcome quality is also considered a crucial construct when measuring perceptions of service quality.

Generally, important outcome gains can be classified as:

- (a) General education (Drexler Jr. and Kleinsorge, 2000; Pace and Kur, 1998);
- (b) Personal and social (Tam, 2006; Pace and Kur, 1998);
- (c) Vocational preparation (DeShields et al., 2005; Ford et al., 1999; Pace and Kur, 1998);
- (d) Information technology (Drexler and Kleinsorge, 2000; Pace and Kur, 1998); and
- (e) Intellectual development (DeShields et al., 2005; Pace and Kur, 1998).

These sub-dimensions are expected to positively affect outcome quality; hence the third hypothesis is proposed:

H3: Higher perceptions of each outcome quality sub-dimension (H3a, H3b, H3c, H3d, and H3e) will positively affect outcome quality.

According to Brady and Cronin (2001), overall perceived service quality is influenced by the primary dimensions; interaction quality, physical environment quality and outcome quality. After formulating the hypotheses proposing the effects of the sub-dimensions on their corresponding primary dimensions, the following hypotheses have been formulated to test the effects of the primary dimensions on overall perceived service quality.

- H4: Higher perceptions of the quality of service interactions will positively affect overall service quality perceptions.
- H5: Higher perceptions of the quality of physical environment will positively affect overall service quality perceptions.
- H6: Higher perceptions of the quality of service outcomes will positively affect overall service quality perceptions.

3.3.2 Hypotheses Relating to Research Objective 2

The discussion in Section 2.7 revealed that satisfaction has a number of antecedents, including service quality, and that a number of other influential factors are expected to affect satisfaction.

The literature reviewed in Section 2.7.1 suggests that service quality is an antecedent of satisfaction and that service quality will have a positive impact on satisfaction. Therefore, the first hypothesis related to Research Objective Two is the relationship of service quality to satisfaction:

- H7: Higher perceptions of overall service quality will positively affect students' overall satisfaction.

Price is considered as the monetary value that is expected to be made within the context of service quality perceptions (Edvardsson and Gustavsson, 1991). Further, price is also expected to influence satisfaction if an inappropriate price is charged (Cronin et al., 2000).

Therefore, the following two hypotheses regarding price are proposed:

H8: Higher perceptions of overall service quality will positively affect price judgments.

H9: Higher perceptions of the price judgment will positively affect students' overall satisfaction.

The literature review indicated that another influential factor that has impacts on service quality and satisfaction is image. Two hypotheses have been formulated regarding image:

H10: Higher perception of image will positively affect students' overall perceptions of service quality.

H11: Higher perception of image will positively affect students' overall satisfaction.

3.3.3 Hypotheses Relating to Research Objective 3

Section 2.7.4 discussed some of the behaviours related to service quality and satisfaction.

Students who had satisfactory educational experiences are expected to recommend the university to others, and this is also an important predictor of attending the same institution in the future (Boulding et al., 1993). There are two hypotheses proposed for favourable future behavioural intentions:

H12: Higher perceptions of satisfaction will positively affect the intention to recommend the university to others.

H13: Higher perceptions of satisfaction will positively affect the intention to attend the university in the future.

3.3.4 Hypotheses Relating to Research Objective 4

Although several studies have measured students' experiences in higher education institutions (Oldfield and Baron, 2000; Athiyaman, 1997; Cuthbert 1996 a,b), the comparative importance of the service quality dimensions identified in these studies has not been clearly determined.

The following hypothesis is therefore proposed:

H14: Students will vary in their perceptions of the importance of (a) each of the primary dimensions, and (b) each of the sub-dimensions.

3.3.5 Hypotheses Relating to Research Objective 5

Although the demographic factors are expected to influence satisfaction, it is also necessary to know how they impact on perceptions of service quality (Clemes et al., 2001). Thus, the following hypothesis is proposed:

H15a: Students' level of satisfaction and the influential factors, and favourable future behavioural intentions will differ according to students' demographic characteristics (age, gender, ethnicity, year in school, and courses of study).

H15b: Students' perceptions of the primary dimensions of service quality will differ according to students' demographic characteristics (age, gender, ethnicity, year in school, and courses of study).

H15c: Students' perceptions of the sub-dimensions of service quality will differ according to students' demographic characteristics (age, gender, ethnicity, year in school, and courses of study).

3.4 Chapter Summary

Chapter Three identified five conceptual gaps in the literature pertaining to student satisfaction, service quality, price, image, and favourable future behavioural intentions in a higher education setting. A conceptual model was developed, and fifteen testable hypotheses were stated.

Chapter 4: Research Design and Methodology

4.1 Introduction

This chapter outlines the research plan and the methodology used to test the fifteen hypotheses formulated in Section 3.3, and to achieve the five research objectives stated in Section 3.1. The research plan includes sample derivation, estimating sample size, method of data collection, questionnaire design, and the data analysis techniques used in this study.

4.2 Sample Derivation

Tertiary education institutions in New Zealand are comprised of Colleges of Education, Institutes of Technology and Polytechnics, Private Training Establishments, Wānangas, and Universities. Universities cater for the majority of students attending these tertiary education institutions (Ministry of Education, 2006). In this study, the perceptions of quality, satisfaction, price, image, and favourable future behavioural intentions of university students are specifically examined.

The data was collected at Lincoln University, New Zealand during the period July 18th to August 10th, 2006. The target population was all 200 and 300 level commerce students, 18 years and older enrolled during the 2006 academic year. The 200 and 300 level commerce student population during the period the research was conducted was 560. First year students (100 level) were not surveyed as the majority of these students did not have sufficient university experience to answer all of the questions in the questionnaire.

4.3 Sample Size

The recommended sample size for factor analysis of observations and variable ratio ranges from three to twenty times the variables under scrutiny (Mundfrom, Shaw, and Ke, 2005). Hair, Anderson, Tatham, and Black (1998) recommended that the minimum sample size needed to be at least five times as many observations as there are variables to be analysed. There are 44 variables to be factor analysed in this study, hence a minimum of 220 completed questionnaires were required.

For multiple regression analysis, Garson (2006) suggests that the population should be greater than, or equal to, the number of independent variables plus 104 for testing regression coefficients. Further, Garson (2006) recommends that for testing the R-square, there should be least 8 times the numbers of independent variables plus 50. In this study, there are 5 independent variables, therefore, at least 109 and 90 completed questionnaires are required respectively in order to test the regression coefficients and the R-square. However, the exact number of independent variables to be analysed depends on the results of the factor analysis (Hair et al., 1998).

4.4 Method of Data Collection

In this study, a survey questionnaire was the instrument used to collect the data. Two volunteers distributed the questionnaires in several commerce subjects to students at the conclusion of lectures. In order to increase the generalisability of the results, prerequisite or core commerce subjects were selected, as these subjects have a broad demographic representation of students. The subjects selected were Accounting 202, Business Management 204, Marketing 201, 301, 304, Finance 202, 304, and Value and Property Management 312.

The questionnaire set included one research information sheet, one three-page questionnaire, and one pre-paid envelope. The volunteers explained to students that they could fill out the questionnaire during their free time and mail back the completed questionnaire using the free post envelop enclosed. Further, volunteers asked students not to take a questionnaire if they had been given one in one of their other subjects. A total of 470 questionnaires were distributed using this process.

4.5 Questionnaire Design

4.5.1 Construct Operationalisation

The extensive review of the literature presented in Chapter 2 identified the proposed primary and sub-dimensions of service quality, as well as the important factors related to students' perceptions of service quality and satisfaction in higher education. However, in order to provide additional insights into the proposed dimensions and develop a questionnaire specifically for New Zealand, it was necessary to conduct focus group interviews.

Focus group research has long been prominent in marketing studies, as market researchers seek to tap emotional and unconscious motivations (Garson, 2006). In particular, Greenbaum (1998) suggests that focus group research is most popular with attitude research, such as service quality evaluations. The use of focus group interviews is also consistent with several service quality studies (Brady and Cronin, 2001; Parasuraman et al., 1985).

Greenbaum (1998) recommends that mini focus groups consisting of 4 to 6 participants is the most efficient size for focus group research, therefore, two mini focus group interviews were conducted following Greenbaum's (1998) guidelines. Further, Hair, Bush and Ortinau (2000) recommended that the focus groups should be as homogeneous as possible. Therefore, the focus group members were gathered in accordance to their year of study at Lincoln University. The first group consisted of five students studying at least three 200 level subjects. The

second focus group consisted of six students studying at least three 300 level subjects.

The domain of the construct was specified to the interviewees at the start of the focus group interviews, as recommended by Churchill (1979). Students were asked to explain all of the factors that contributed to their judgements of university experiences. They were asked to consider three aspects; their lectures, the university environment, and their learning outcomes aspects. After these concepts, the students were asked to consider the most important factors of each of the three aspects.

The information gathered in the focus group interviews was recorded and transcribed. The information and the findings from the literature review were used as the basis for the item generation in the questionnaire development stage. The final questionnaire consisted of 62 items formulated to measure all of the constructs discussed in Chapter 2 (see Figure 3.1).

4.5.2 Design and Layout of the Survey Instrument

The questionnaire is divided into five sections. Sections A, B and C contain the Interaction Quality, Physical Environment Quality, and Outcome Quality items. The items are grouped in accordance with each of their pertaining primary dimensions. Section D contains the items on Service Quality, Satisfaction, Price, and Image. Section E contains demographic and favourable future behavioural intention items.

Performance-only items are included in the questionnaire, as numerous studies have demonstrated the superiority of performance-only over difference score measures (Zeithaml et al., 1996, Cronin and Taylor, 1994). Moreover, all the items are positively worded, as recommended by Parasuraman et al. (1991) and Carman (1990). This study focused on students' overall academic satisfaction, therefore, students were requested to evaluate their overall experiences at Lincoln University, and not to relate their response to any particular subject or lecturer.

Molenaar (1982) recommended that for items used in questionnaire, the optimal number of response categories was seven plus or minus two. A seven-point Likert-type scale was used to measure the performance-only items used in the questionnaire developed for this study. Only the extreme end-points were verbally labelled, from 1 representing Strongly Agree to 7 representing Strongly Disagree, no verbal labels were used for scale points 2 to 6, as Andrews (1984) suggested that labelling all of the response categories can result in inaccurate responses. One N/A response category representing not applicable was included for all performance-only items as this reduces central tendency bias (Smith, 1995) and improves the likelihood of eliciting accurate and valid responses (Coulthard, 2004).

Two performance-only items in Section D were labeled differently, one item measuring Satisfaction ranged from 1 representing Very Dissatisfied to 7 representing Very Satisfied, and one item measuring Service Quality ranged from 1 representing Poor to 7 representing Excellent. The three items measuring favourable future behavioural intentions in Section E are labelled from Highly Unlikely (1) to Highly Likely (7). In Section E, the demographic factors are selected by ticking the appropriate box.

The Service Quality and Satisfaction constructs were measured using three items each, as combining three or more items reduces measurement error and improves reliability (Churchill, 1979). The Intention to Recommend construct was measured using a single item, however, Hair et al. (1998) cautioned that some degree of measurement error may occur with single item measures.

4.5.3 Pre-testing Procedures

As the questionnaire was developed specifically for this research, a pre-test procedure was used to improve the reliability and validity of the instrument. In the pre-test procedure, thirty 200 level and 300 level students studying a commerce degree were requested to read the

questionnaire, respond to the statements, and comment on any ambiguous or unclear statements that were difficult to answer. Some minor wording modifications to the questionnaire were made as a result of this process. The final version of the questionnaire is in Appendix 2.

4.6 Data Analysis Techniques

The three statistical techniques used in this study are exploratory factor analysis, multiple regression analysis, and analysis of variance. Exploratory factor analysis is used to examine the underlying factors that make-up the sub-dimensions, multiple regression analysis is used to test the conceptual model, and analysis of variance is used to compare the results that are based on demographic factors.

4.6.1 Factor Analysis

Factor analysis is a branch of multivariate analysis that is concerned with the internal relationships of a set of variables (Stewart, 1981). Factor analysis has three general functions: (1) minimising the number of variables while the amount of information in the analysis is maximised; (2) searching qualitative and quantitative data distinctions when the data is too large; (3) testing hypotheses about the number of distinctions or factors underlying a set of data (Stewart, 1981). Factor analysis generates a table in which the rows are the observed raw indicator variables and the columns are the factors or latent variables which explain as much of the variance in the indicating variables as possible (Garson, 2006).

The following sections overview different types of factor analysis, the assumptions of factor analysis, and appropriateness of factoring a correlation matrix, factor rotation, and interpretation of resulting factors.

4.6.1.1 Factor Analytic Data Modes

There are several modes of factor analysis (see Table 4.1); all of the various modes of factor analysis provide information about the dimensional structure of data (Stewart, 1981). The appropriate mode of factor analysis depends on whether the research objective is to identify relationships among either variables, respondents, or occasions (Hair et al., 1998). In this study, the objective is to identify the relationships among variables from the data set collected from a number of individuals at one occasion. Therefore, it is appropriate that R-mode factor analysis is used in this study to identify the dimensions that are latent (Hair et al., 1998).

Table 4.1: Modes of Factor Analysis (Stewart, 1981, p.53).

Technique	Factors are loaded by	Indices of association are computed across	Data are collected on
R	Variables	Persons	One occasion
Q	Persons	Variables	One occasion
S	Persons	Occasions	One variable
T	Occasions	Persons	One variable
P	Variables	Occasions	One person
O	Occasions	Variables	One person

4.6.1.2 Types of Factor Analysis

Factor analytic techniques can achieve their purposes from either an exploratory or confirmatory perspective (Hair et al, 1998). *Exploratory factor analysis* seeks to uncover the underlying structure of a relatively large set of variables (Garson, 2006), this technique is useful in searching for structure among a set of variables or as a data reduction method (Hair et al., 1998). Confirmatory factor analysis seeks to test if the hypotheses involving issues such as which variables should be grouped together on a factor, or the precise number of factors based on theoretical support or prior research that can be supported (Hair et al., 1998).

This study adopts exploratory factor analysis. Common factor analysis and principal factor analysis are two basic models of exploratory factor analysis used when obtaining factor

solutions (Hair et al., 1998). The selection of the appropriate model is based on two criteria (1) the objectives of the factor analysis, and (2) the amount of prior knowledge about the variance in the variables (Hair et al., 1998).

Common factor analysis is used when the primary objective is to identify the latent dimensions or constructs represented in the original variables, and the researcher has little knowledge about the amount of specific and error variance (Hair et al., 1998). Common factor analysis is a correlation-focused approach seeking to reproduce the intercorrelation among the variables (Garson, 2006). In contrast, *component factor analysis* is appropriate when the primary concern is about prediction, or the minimum number of factors needed to account for the maximum portion of the variance represented in the original set of variables, and when prior knowledge suggests that specific and error variance represents a relatively small proportion of the total variance (Hair et al., 1998). Component factor analysis is a variance-focused approach seeking to reproduce both the total variable variance with all components and to reproduce the correlations (Garson, 2006).

Common factor analysis is considered more problematic and complicated, and as a result, the use of component factor analysis has become much more widespread (Hair et al., 1998). In this study, component factor analysis was considered the most appropriate method to analyse the data.

4.6.1.3 Assumptions for Factor Analysis

Regardless of the type of factor analysis adopted, there are several critical conceptual and statistical assumptions underlying factor analysis (Hair et al., 1998). The assumptions are:

No selection bias/proper specification. Factor analysis is a technique of exploring data whose structure is unknown; the technique has no means of determining the appropriateness of data other than the correlation among variables (Hair et al., 1998). The exclusion of relevant

variables and the inclusion of irrelevant variables in the correlation matrix being factored will affect, often substantially, the factors which are uncovered (Garson, 2006). Therefore, researchers must ensure that the observed patterns are conceptually valid and appropriate to study using factor analysis (Hair et al., 1998).

Linearity. Factor analysis is a linear procedure, the smaller the sample size, the more important it is to screen the data for linearity (Garson, 2006).

Normality. Screening data for normality is necessary if a statistical test is applied to the significance of the factors (Hair, et al., 1998). However, as factor analysis is used to identify interrelated sets of variables, some degree of multicollinearity is desirable (Hair, et al., 1998).

Homoscedasticity. Factor analysis also assumes homoscedasticity to the extent that they diminish the observed correlations (Hair et al., 1998).

However, if the data matrix has sufficient correlations to justify the application of factor analysis, the statistical assumptions of linearity, normality, and homoscedasticity do not have to be met (Hair et al., 1998). The approaches to justify sufficient correlations for factor analysis are discussed in the following section.

4.6.1.4 Tests for Determining Appropriateness of Factor Analysis

Hair et al., (1998) suggested that there are several useful methods for determining whether a factor analysis should be applied to a set of data. The methods are: (1) examination of the correlation matrix; (2) inspection of the anti-image correlation matrix; (3) Barlett's test of sphericity; and (4) The Kaiser-Meyer-Olkin measure of sampling adequacy.

Examination of the correlation matrix is the simplest method for determining appropriateness of a matrix for factoring. If visual inspection reveals most of substantial number of

correlations greater than .30, then factor analysis is appropriate (Hair et al., 1998), if the correlation coefficients are too small throughout the matrix, factoring maybe inappropriate (Stewart, 1981).

Inspection of anti-image correlation matrix. Another procedure for determining the appropriateness of a matrix for factoring is an inspection of the off-diagonal elements of the anti-image covariance or correlation matrix (Stewart, 1981). An anti-image correlation matrix is the negative value of the partial correlations (Hair et al., 1998); the correlation matrix should be near diagonal if the matrix is appropriate for factoring, if the anti-image matrix has many nonzero off-diagonal entries, the correlation matrix is not appropriate for factoring (Stewart, 1981).

Barlett's Test of Sphericity is a widely programmed statistical test of appropriateness of a matrix for factoring; it provides the statistical probability that the correlation matrix has significant correlations among at least some of the variables (Hair et al., 1998). Barlett's Test of Sphericity is computed by the formula:

$$-\left[(N-1) - \left(\frac{2P+5}{6} \right) \right] \text{Log}_e |R|$$

where
 N is the sample size,
 P is the number of variables, and
 $|R|$ is the determinant of the correlation matrix

Equation 4.1: Barlett's Test Sphericity.

The hypothesis tested is that the correlation matrix came from a population of variables that are independent. Rejection of the hypothesis is an indication that the data are appropriate for factor analysis (Stewart, 1981).

Kaiser-Oeyer-Olkin measure of sample adequacy, MSA. The MSA provides the extent which the variables belong together are thus appropriate for factor analysis (Stewart, 1981). There is a MSA statistic for each individual variable and their sum is the overall statistic (Garson, 2006), the formula for overall MSA is:

$$MSA = \frac{\sum_{j \neq k} r^2_{jk}}{\sum_{j \neq k} r^2_{jk} + \sum_{j \neq k} q^2_{jk}}$$

where

q^2_{jk} is the square of the off-diagonal elements of the anti-image correlation matrix, and r^2_{jk} is the square of the off-diagonal elements of the original correlations

Equation 4.2: Overall Measure of Sample Adequacy.

The index ranges from 0 to 1.0, reaching 1 when each variable is perfectly predicted without error by other variables (Hair et al., 1998). Kaiser and Rice (as cited by Stewart, 1981) gave the following calibration of the MSA: .90+ (marvellous); .80+ (meritorious); .70+ (middling); .60+ (mediocre); .50+ (miserable); below .50 (unacceptable).

4.6.1.5 Factor Extraction in Principal Components Analysis

When a large set of variables is factored, the initial procedure is to extract the combinations of variables explaining the greatest amount of variance and then proceed to combinations that account for smaller amounts of variance (Hair et al., 1998). Stewart (1981) suggested that there is a well established body of literature pertaining to factor analysis regarding in determining how many factors to extract, and the criteria for ceasing to extract. Common criteria are (1) Latent Root Criterion; and (2) Scree Plot.

Latent root criterion is the most commonly used technique. The rational is that any individual factor should account for the variance of at least a single variable if it is to be retained for interpretation; each variable contributes a value of 1 to the total eigenvalue (Hair et al., 1998). Only the factors having latent roots or eigenvalues greater than 1 are considered significant, otherwise they should be disregarded (Stewart, 1981). This method is most reliable when the

number of variables in the factor analysis is between 20 and 50 (Hair et al., 1998).

Scree test criterion is derived by plotting the latent roots against the number of factors in their order of extraction, and the shape of the resulting curve is used to evaluate the cutoff point (Hair et al., 1998). The procedure is explained by Stewart (1981):

“A straight edge is laid across the bottom portion of the roots to see where they form an approximately straight line. The point where the factors curve above the straight line gives the number of factors, the last factor being the one whose eigenvalue immediately proceeds the straight line” (p.58).

4.6.1.6 Factor Rotation

The selection of the final factors involves interpreting the computed factor matrix. The factor matrix contains factor loadings for each variable on each factor (Hair et al., 1998). Factor loadings indicate the degree of correspondence between the variable and the factor, with higher loadings making the variable representative of variable loadings (Hair et al., 1998). Computation of factor matrix can be unrotated, orthogonally rotated, and obliquely rotated.

An *unrotated factor matrix* is computed to assist in obtaining a preliminary indication of the number of factors to extract (Hair et al., 1998). The solution maximises the sum of squared factor loadings, efficiently creates a set of factors which explains as much of the variance in the original variables as possible (Garson, 2006). However, an unrotated factor matrix may not provide a meaningful pattern of variable loadings as they tend to load on multiple factors (Garson, 2006), computation of factor rotations are desired to improve the interpretation by reducing the ambiguity in the unrotated factor solution (Hair et al., 1998).

Orthogonal rotations are the simplest case of rotation in which axes are maintained at 90 degrees. Three orthogonal rotation methods include VARIMAX, and QUARMAX.

VARIMAX maximises the variance of the squared loadings of a factor on all the variables in a factor matrix, this process has the effect of differentiating the original variable by extracted factor (Garson, 2006). When the correlation is close to +1 or -1, it can be interpreted as a high positive or negative association between the variable and the factor; when the correlation is closest to 0, it indicates a lack of association (Hair et al., 1998). QUARMAX is an alternative orthogonal method, it focuses on rotating the initial factor so that a variable loads high on one factor and as low as possible on all other factors (Hair et al., 1998).

Oblique rotations are similar to orthogonal rotations, except that oblique rotations allow correlated factors instead of maintaining independence between the rotated factors (Hair et al., 1998). Two commonly used oblique methods include OBLIMIN and PROMAX.

OBLIMIN is the standard method when seeking a non-orthogonal solution. Performing OBLIMIN will result in higher eigenvalues but diminished interpretability of the factors (Garson, 2006). PROMAX is similar to OBLIMIN but computationally faster than OBLIMIN and therefore is sometimes used (Garson, 2006).

The use of the orthogonal rotation approach is more widespread in the marketing literature. Nevertheless, very few factors are uncorrelated in reality (Hair et al., 1998), a strong likelihood of correlated factors and hierarchical factor solutions are intuitively attractive and theoretically justified in many marketing applications (Stewart, 1981). Stewart (1981) suggested that both orthogonal and oblique rotation should be conducted. Therefore, in this study, a VARIMAX orthogonal rotation and an OBLIMIN oblique rotation were performed.

4.6.1.7 Interpretation of Factors

When interpreting factors, decisions must be made regarding which factor loadings are worth considering. The significance of factor loadings is dependent on the sample size (see Table 4.1), in general, the larger the absolute size of the factor loading, the more important the loading in interpreting the factor matrix (Hair et al., 1998). Hair et al. (1998, p.112) suggested three criteria for the significance of factor loadings:

“(1) The larger the sample size, the smaller the loading to be considered significant; (2) the larger the number of variables being analysed, the smaller the loading to be considered significant; and (3) the larger the number of factors, the larger the size of the loadings on later factors to be considered significant for interpretation”.

Table 4.2: Guidelines for identifying significant factor loadings based on sample size (Hair et al., 1998, p.112).

Factor Loading	Sample Size Needed for Significance	Factor Loading	Sample Size Needed for Significance
0.30	350	0.55	100
0.35	250	0.60	85
0.40	200	0.65	70
0.45	150	0.70	60
0.50	120	0.75	50

* Based on a .05 significance level and power level of 80 percent, and standard errors assumed to be twice those of conventional correlation coefficients.

Most factor solutions does not result in a simple structure where the single highest loading is significant for each variable, hence many variables have several moderate-size loadings (Hair et al., 1998). The factor solution is obtained when all significant loadings for variables load on a factor (Hair et al., 1998). By examining all the underlined variables for a particular factor, the researcher needs to assign a name or label to a factor that accurately reflects the variables loading on that factor (Hair et al., 1998).

4.6.2 Summated Scale

The results of an exploratory factor analysis are often used to replace the original set of variables with an entirely new, smaller set of variables (Hair et al., 1998). In order to reduce the reliance on a single response and measurement error³, Hair et al. (1998) recommends using a summated scale as a replacement variable.

A summated scale is formed by combining all the variable loadings highly on a factor and the sum or the average score of the variables (Hair et al., 1998). As the summated scale will represent the multiple aspects of concept in a single measure, construction of summated scale must maintain content validity, dimensionality and reliability (Hair et al., 1998).

4.6.2.1 Content Validity

Content validity⁴ considers practical and theoretical issues to ensure that the summated scales are assessing the correspondence between individual items and the concept (Hair et al., 1998). A display of content validity indicates that the items are adequate and are representative of the concept they are intended to measure (Churchill, 1979).

4.6.2.2 Dimensionality

The assumption for creating a summated scale is that items are unidimensional, meaning that they are strongly associated with each other and represent a single concept. The test of unidimensionality⁴ is that each summated scale should consist of items loading on a single factor (Hair et al., 1998).

4.6.2.3 Reliability

Reliability is an assessment of the degree of consistency between multiple measurements of variables. One reliability test is internal consistency, the rationale of internal consistency is that the individual items or indicators of the scale should all be measuring the same construct and

³ Measurement error is the degree to which the observed values are not representative of the “true” values due to any number of reasons.

⁴ Also known as face validity

thus be highly correlated (Hair et al., 1998). Cronbach's alpha (1951) has been one of most widely used measure to test scale reliability. Churchill (1979) recommends that an alpha of 0.60 or greater is adequate for a newly developed questionnaire.

4.6.3 Multiple Regression Analysis

After performing the factor analysis and creating summated scales, the proposed sub-dimensions may be confirmed and used for subsequent statistical analyses. In this study, thirteen hypotheses were formulated (see Chapter 3) that relate to examining the relationships between the constructs. According to Hair et al. (1998), when analysing the relationships between a single dependent variable and several independent variables, multiple regression analysis is an appropriate statistical technique.

Multiple regression analysis provides a means of objectively assessing the degree and character of the relationship between dependent and independent variables by forming the predictive powers of independent variables (Hair et al., 1998). The independent variables, in addition to their predictive powers, may also be considered for their individual contribution to the variate and its predictions. Furthermore, the beta coefficients of the independent variables can also be used to determine its derived importance to the dependent variable when compared with other independent variables in the same model (Chu, 2002).

To interpret the regression variate, Hair et al. (1998) recommended that the most direct method is to determine the relative importance of each independent variable in the prediction of the dependent measure.

Multiple regression takes the form $y = c + b_1X_1 + b_2X_2 + \dots + b_nX_n + e$. The y is the true dependent; the b_1, b_2, \dots, b_n are the regression coefficients, representing the amount the dependent variable y changes when the corresponding independent changes 1 unit; the c is the constant, where the regression line intercepts the y axis; and the e is the error term reflected in

the residuals (Garson, 2006).

When evaluating how well the regression equation explains the variation in y , R^2 is the coefficient of determination (Dielman, 2001). The R^2 represents the proportion of the variation in y explained by the regression, R^2 ranges from 0 and 1. The closer to 1 the value of R^2 is, the better the fit of the regression equation to the data (Dielman, 2001). Another measure of how well the regression equation fits the data is the F statistic:

$$F \text{ ratio} = \frac{MSR}{MSE}$$

Equation 4.3: F-ratio Statistic.

where MSR = the regression sum of squares divided by its degree of freedom, and MSE = error sum of squares divided by its degree of freedom. The degree of freedom associated with the error sum of squares is equal to $n - K - 1$ (Dielman, 2001).

The F-ratio statistic is evaluated with the critical value. The decision rule for the test is:

(1) reject the null hypothesis if F is greater than the critical value of an appropriate level of significance, implying that at least one of the explanatory variables helps explain the variation in the dependent variable, (2) accept the null hypothesis if F is less than or equal to the critical value of an appropriate level of significance, implying that the explanatory variables in the regression equation are of little or no use in explaining the variation in the dependent variable (Dielman, 2001).

4.6.4 Analysis of Variance (ANOVA)

Analysis of variance (ANOVA) is a statistical technique used to test whether there is a difference between means of several populations (Dielman, 2001). ANOVA is used to test for students' perceptual differences of the constructs based on their demographic characteristics

in this study. The logic of an ANOVA test is comparing the estimates of the variance of the respondents within the groups and the estimates of the variance of the respondents between the groups (Hair et al., 1998). The key statistic used to conduct the test is F-statistic of difference of group means:

$$F = \frac{\text{Mean Square within groups}}{\text{Mean Square between groups}} = \frac{MS_B}{MS_W}$$

Equation 4.4: F Statistic for ANOVA.

To determine if the F-statistic is sufficiently large to support rejection of null hypotheses (when means of all groups are equal), the F-statistic must be greater than the critical value from the F distribution (F_{crit}) based on the numerator⁵ and denominator⁶ degrees of freedom, which implies that the means across all groups are not all equal (Hair et al., 1998).

4.6.5 Assumptions for Regression Analysis and Analysis of Variance

The following assumptions are tested prior to applying the regression analysis and analysis of variance used in this study.

4.6.5.1 Outliers

Outliers are observations with a unique combination of characteristics identifiable as distinctly different from the other observations (Hair et al., 1998). Outliers have large residual values, and are far from the rest of the observations (Hair et al., 1998). The presence of an outlier may have large effects on the estimated regression line, and can at times produce confusing results and mask important information that could otherwise be obtained from the regression (Dielman, 2001).

Outliers can be identified by examining a study of the standardised residuals, a rule of thumb is that outliers are points whose standardised residuals are greater than 3 (Maddala, 2001).

⁵ Numerator degree of freedom is the number of populations minus one

⁶ Denominator degree of freedom is the total sample size minus the number of the populations

Outliers should be studied carefully to see whether deletion is an appropriate option (Dielman, 2001). Outliers should be removed only if there is reason to believe that other variables not in the model explain why the outlier observations are unusual (Garson, 2006).

4.6.5.2 Multicollinearity

In the multiple regression analysis, it is not desirable for strong relationships to exist among explanatory variables (Dielman, 2001). When the explanatory variables are highly correlated, the multicollinearity problem occurs (Dielman, 2001), and it becomes difficult to disentangle the separate effects of each of the explanatory variables on the dependent variable (Maddala, 2001).

Further, Hill, Griffins, and Judge (2001) comment that the presence of a high degree of multicollinearity will result in the following problems: (1) the regression coefficient cannot be defined when the explanatory variables have one or more exact relationships⁷; (2) the variance, standard errors, and covariances of the regression coefficient will be disproportionately large when the explanatory variables have nearly exact relationships; (3) when the standard errors are large, the usual t-test may lead to the confusion that the parameter estimates are not significantly different from zero, and excluded the possibility of high R^2 or F-values that indicates significant explanatory power; (4) dropping or adding variables causes large changes in the estimates of the coefficients of other variables. However, Maddala (2001) stated that as long as there is enough variation in the explanatory variables and the variance of the error term is sufficiently small, high correlation among explanatory variables does not necessarily create a problem.

To detect whether multicollinearity is considered a serious problem, Maddala (2001) suggests that when the R^2 is very high, and F-ratio is also highly significant, but there are insignificant

⁷ The exact relationship is when the correlation coefficients are ± 1

individual t-ratios, then multicollinearity has a significant effect on the regression equations. Dielman (2001) recommended computing the variance inflation factor (VIF) which measures the strength of the relationship between one explanatory and other explanatory variables in the regression. The VIF is computed by performing the regression of X_j on the remaining explanatory variables and the coefficient of determination from this regression R^2_j . The VIF for the variable X_j is

$$VIF_j = \frac{1}{1 - R^2_j}$$

Equation 4.5: Variance Inflation Factor.

If there is no relationship, then $R^2_j=0.0$ and $VIF_j=1$, and VIF_j increases as R^2_j increases. If the individual VIF_j values are large (greater than 10), or the average of the VIF_j greater than 10, then multicollinearity may be influencing the least-squares estimates of the regression coefficients (Dielman, 2001). Moreover, the VIF values should also be evaluated relative to the overall fit of the model, that is, when the VIF values are less than $1/(1-R^2)$ where R^2 is the coefficient of the determination for the model with all explanatory variables included, it indicates that the explanatory variables are more strongly related to the dependent variables than they are to each other, hence multicollinearity is not a serious problem (Dielman, 2001).

The condition indices in SPSS is an alternative method of assessing excessive collinearity in the data, it is the square roots of the ratio of the largest eigenvalues to each other eigenvalue. A condition index over 30 suggests serious collinearity problems and an index over 15 indicates possible collinearity problems (Garson, 2006).

4.6.5.3 Linearity

The linearity of the relationship between the dependent and independent variable represents the degree to which the change in the dependent variable is associated with the independent

variable, where the regression coefficient of independent variables is constant across the range of values (Hair et al., 1998).

The concept of correlation is based on a linear relationship (Hair et al., 1998), the assumption of linearity can be checked visually through residual plots (Dielman, 2001). In multiple regression with more than one independent variable, an examination of the residuals shows the combined effects of all predictor variables (Hair et al., 1998).

In a multiple regression, the scatter plot of the standardised residuals versus the fitted values provides an overall picture, while the plots of the standardised residuals versus each explanatory variable may help identify any violations specifically related to an individual explanatory variable (Dielman, 2001).

4.6.5.4 Error term Normality

Errors, represented by the residuals, should be normally distributed for each set of values of variables (Garson, 2006). The simplest diagnostic for the set of predictor variables in the equation is a histogram of residuals with a visual check for a distribution approximating the normal distribution (Hair et al, 1998).

However, a normality probability plot is a better method for assessing normality (Hair et al., 1998). When the plot of the normal-scores⁸ (cumulative probabilities) and the data is approximately a straight line, the normality appears reasonable, or otherwise the plot will show curvature (Dielman, 2001).

4.6.5.5 Error Term Independence

Multiple regression analysis assumes that the error terms are independent (Dielman, 2001). In a residual plot, the pattern should appear random and similar to null plots of residuals (Hair et al., 1998). If the independence assumption is violated, the residual plots will have a consistent

⁸ Normal scores are numbers we expect to see from a sample from a normal distribution, so the plots of the two sets of data have to be similar (Dielman, 2001).

pattern (Hair et al., 1998).

A well-known and widely used test to diagnosis error term independence is Durbin-Watson test (Dielman, 2001). The Durbin-Watson statistic is computed by first using least squares to estimate the regression equation and then by computing the residuals:

$$\hat{e}_i = y_i - \hat{y}_i$$

where y_i represents one of the sample y values and \hat{y}_i is the corresponding predicted y value. The residuals are used to compute the Durbin-Watson statistic, d :

$$d = \frac{\sum_{i=2}^n (\hat{e}_i - \hat{e}_{i-1})^2}{\sum_{i=1}^n \hat{e}_i^2}$$

Equation 4.6: Durbin-Watson Statistic.

The value of d ranges from 0 to 4, value closes to 0 indicates extreme positive autocorrelation, value closes to 4 indicates extreme negative autocorrelation, and value closes to 2 indicates no serial autocorrelation (Garson, 2006). The decision rule for Durbin-Watson test is: (1) reject the null hypothesis if $d < d_L$, (2) accept the null hypothesis if $d > d_U$, and (3) inconclusive if $d_L < d < d_U$ (Dielman, 2001).

4.6.5.6 Error Term Homoscedasticity

The assumption of homoscedasticity states that the error term, e_i , have constant variances σ^2 (Dielman, 2001). However, the presence of unequal variance (heteroscedasticity) is one of the most common violations of multiple regression assumptions (Hair et al., 1998).

In a residual plot of \hat{e}_i versus an exploratory variable x , the residuals should appear scattered randomly about the zero line with no differences in the amount of variation in the residuals regardless of the value of x (Dielman, 2001). In the case of heteroscedasticity, there appears to be a difference in violation, and is identified by a triangular-shaped pattern in the residual plot (Hair et al., 1998).

When heteroscedasticity is present, the use of least-squares has two major drawbacks: (1) the estimates of the regression coefficient are no longer minimum variance estimates, and (2) the estimates of the standard errors of the coefficients are biased (Dielman, 2001).

4.7 Chapter Summary

This chapter has outlined the research plan and methodology used to test the fifteen hypotheses, stated in Section 3.3. In particular, the sample size selection, data collection method and questionnaire design were detailed. The statistical methodology used in this including factor analyses, multiple regression analysis, and analysis of variance and their assumptions were also explained.

Chapter 5: Results and Discussion

5.1 Introduction

This chapter presents the results and discusses the findings of the study. The data set is examined to ensure its appropriateness for factor analysis. The statistical assumptions of multiple regression and analysis of variance are tested to ensure the representativeness of the results. The results of the factor analysis, multiple regression analysis, and analysis of variance are presented, and the 15 hypotheses tested. The results are discussed in terms of their relation to each of the pertaining research objectives.

5.2 Sample and Response Rates

Of the 470 questionnaires distributed, 228 were returned within the two-week response period. Five of the questionnaires were incomplete, or were not suitable for use in this study. This resulted in a total of 223 completed questionnaires, and a 47.44 percent usable response rate.

The usable responses were above the minimum sample size of 220 as suggested by Hair et al. (1998). Therefore, the sample size was deemed to be acceptable for the purposes of this research.

5.2.1 Non-response Bias

5.2.1.1 Early/Late Responses

The generalisability of the results can be affected by non-response bias (Churchill, 1979). Armstrong and Overton (1977) suggested an extrapolation method for estimating non-response bias. Extrapolation method is based on the assumption that a subject who has responded less readily⁹ is more like a non-respondent.

⁹ Less readily was defined as answering later, or as requiring more prodding to answer (Armstrong & Overton, 1977)

In this study, 97 respondents sent their questionnaires back during first week and 126 respondents sent them back during second week. Firstly, the mean scores for the sum of sub-dimensions, the Service Quality items, the Satisfaction items, the Image items, the Price items, the Future Attendance items and Recommendation item of the two groups were computed. Secondly, independent t-tests (as shown in Table 5.1) were conducted to determine if the group means were statistically significant. The equal variance significance values for all constructs were all greater than 0.05 significance level, indicating that the two groups have equal variances. The equal variance that means significance values were also greater than 0.05, indicating that the two groups have equal means. Therefore, the researcher concluded that there was no evidence of non-response bias in this study.

Table 5.1: Independent Sample Test for Non-Response Bias.

Equal Variance Assumed

Construct	Levene's Test for Equality of Variances		t-test for Equality of Means Significant at 5% level				
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Interaction Quality	0.577	0.448	-0.332	221	0.740	-0.052	0.156
Physical Environment Quality	0.001	0.974	-0.656	221	0.512	-0.101	0.153
Outcome Quality	1.555	0.214	0.465	221	0.642	0.082	0.177
Service Quality	0.085	0.771	-0.847	221	0.398	-0.124	0.147
Satisfaction	0.009	0.923	-0.019	221	0.985	-0.003	0.167
Image	0.036	0.850	0.585	221	0.559	0.093	0.160
Price	0.189	0.664	1.815	221	0.071	0.422	0.232
Future Attendance	0.199	0.656	-0.147	221	0.883	-0.034	0.228
Recommend	0.070	0.792	0.445	221	0.657	0.111	0.248

5.2.1.2 Item Non-Responses

Item non-response refers to the particular items that the respondents leave blank on their questionnaires due to fatigue, sensitivity, lack of knowledge, or other factors, and these responses must be properly accounted for in the analysis (Garson, 2006).

In this study, Not Applicable (N/A) was included in the response category to capture these types of responses. The non-response rate for most of the items used in the questionnaire was

less than 1%. However, four items had a non response rate greater than 1%. Firstly, Separate Variance t-tests (as shown in Appendix 3, Table 23A) were computed to determine whether the missing values are Missing Completely At Random (MCAR¹⁰) or Missing At Random (MAR¹¹). The correlation between variables that have 1% or more missing values and all other variables are significant at greater than 0.05 level, indicating that these missing values are missing at random (MAR). Therefore, imputation for these missing values was undertaken. The missing values have been imputed with the estimated means (as shown in Appendix 3, Table 24A) based on the Maximum Likelihood Estimation (MLE) method with normal distribution, as recommended by Garson (2006).

5.3 Descriptive Statistics

Section E of the Questionnaire has been designed to capture some basic demographic details of the respondents that took part in this study. Results of the demographic characteristics of the respondents are presented in Tables 5.2 and 5.3. There are slightly more male respondents than female respondents, 52.02% and 47.98% respectively. Respondents aged 18-24 account for 70.4% of the sample, and Asian students is the highest ethnic group (60.99%).

Table 5.2: Gender, Age, and Ethnicity Results.

Gender			Ethnicity		
	Frequency	Percent		Frequency	Percent
Male	116	52.02	NZ European	64	28.70
Female	107	47.98	NZ Maori	2	0.90
Total	223	100	Pacific Islander	3	1.35
Age			European	5	2.24
18-24	157	70.40	Asian	136	60.99
25-32	54	24.22	Others	13	5.83
33-40	8	3.59	Total	223	100
40+	4	1.79			
Total	223	100			

¹⁰ Missing Completely A Random (MCAR) is a condition which exists when missing values are randomly distributed across all observations.

¹¹ Missing At Random (MAR) is a condition which exists when missing values are not randomly distributed across all observations but are randomly distributed within one or more sub-samples.

The results for the students' field of study and year of enrollment are presented in Tables 5.3 and 5.4. Of the thirteen majors available at the university, the Finance major was the largest group (22.87%), followed by Accounting (15.25%) and Business Management (15.25%). There were more respondents studying in Year 3 than Year 2, 59.19% and 40.81% respectively.

Table 5.3: Major Results.

Major	Frequency	Percent	Major	Frequency	Percent
Accounting	34	15.25	Hospitality Management	10	4.48
Agribusiness	6	2.69	International Business	8	3.59
Business Management	34	15.25	Marketing	22	9.87
Computing	6	2.69	Property Management	17	7.62
E-Commerce	0	0.00	Supply Chain Management	15	6.73
Finance	51	22.87	Tourism Management	12	5.38
Economics	8	3.59	Total	223	100

Table 5.4: Year of Study Results.

Year of Study	Frequency	Percent
Year 2 (200 level)	91	40.81
Year 3 (300 level)	132	59.19
Total	223	100

5.4 Assessment for Factor Analysis

5.4.1 Statistical Assumptions for Factor Analysis

After the data was collected and tabulated, a series of statistical assumptions were met to ensure the appropriateness of the data for factor analysis.

5.4.1.1 Examination of the Correlation Matrix.

The visual inspection of the correlation matrix (Appendix 4) revealed that more than half of the correlations were greater than .30 as recommended by Hair et al. (1998), therefore, the data is considered appropriate for factor analysis.

5.4.1.2 Inspection of Anti-Image Correlation Matrix

Inspection off-diagonal elements of the anti-image correlation matrix (Appendix 5) revealed that majority of these values were close to zero (absolute values less than 0.01). This indicates that the data set is appropriate for factor analysis (Hair et al., 1998).

5.4.1.3 Barlett's Test of Sphericity

Barlett's Test of Sphericity examines whether the correlation matrix comes from a population of variables that are independent. If the test value is large and level of significance is low, then the hypothesis of dependence is rejected. Rejection of the hypothesis is an indication that the data set is appropriate for factor analysis (Stewart, 1981). In the correlation matrix, the test value was 6593.651, and level of significance was low 0.000, which means that the data set is appropriate for factor analysis.

5.4.1.4 Kaiser-Oeyor-Olkin Measure of Sample Adequacy, MSA

The MSA index ranges from 0 to 1.0, in this data set, the MSA index was .911. According to Kaiser and Rice (as cited by Stewart, 1981), this value indicates "marvellous", which means that the variables belonged together, and are appropriate for factor analysis.

5.4.2 Factor Analysis Results

The assessment of statistical assumption tests revealed that the data set is appropriate for a factor analysis, consequently, principle component factor analysis was conducted on all of the items that were compiled from the information gathered in the focus groups and from the literature review.

5.4.2.1 Latent Root Criterion

Latent root criterion considers all factors that have eigenvalues greater than 1 as significant (Stewart, 1981). Results of the latent root criterion (Appendix 6) indicated that the 44 variables submitted for factor analysis should be extracted to form ten dimensions. These ten dimensions explained 70.18 % of the variation in the data.

5.4.2.2 Scree Test Criterion

By laying a straight edge across the bottom portion of the roots, there are ten factors before the curve becomes approximately a straight line (see Figure 5.1). Therefore, this indicates that the extraction of ten dimensions is appropriate for this analysis.

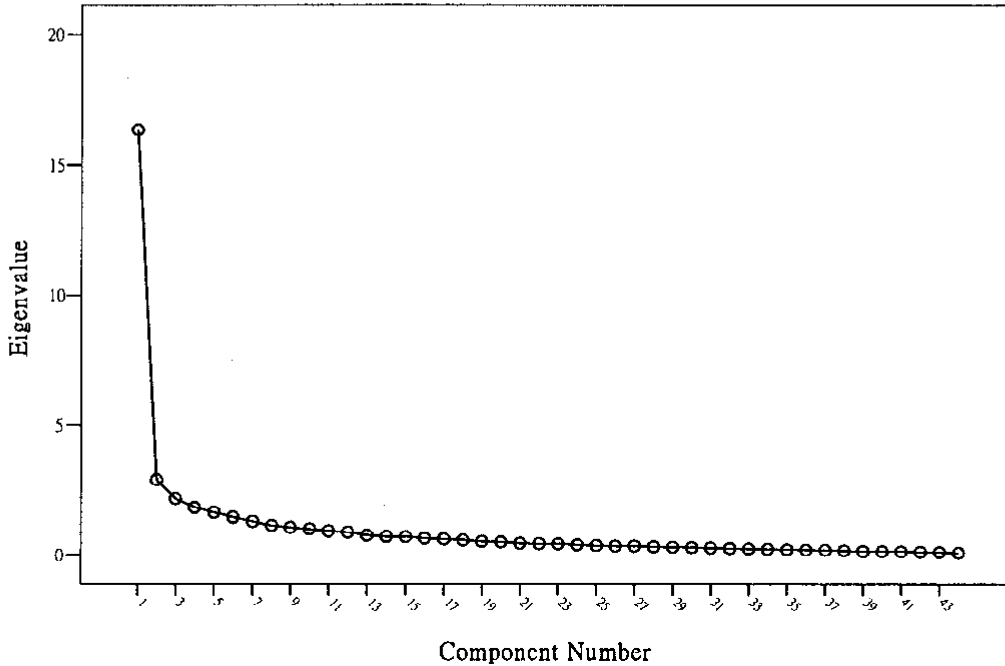


Figure 5.1: The Scree Plot.

5.4.2.3 Factor Rotation

The selection of the final factors involves interpreting the computed factor matrix (Hair et al., 1998). In this study, the initial inspection of the unrotated factor matrix revealed that 42 variables highly loaded on a single factor. However, b14 and b15 loaded together on the other independent factor. The matrix did not have a meaningful pattern, and in order to reduce ambiguity, an orthogonal rotation (VARIMAX) and an oblique rotation (OBLIMIN) were conducted.

After factor rotation, both the VARIMAX and OBLIMIN rotations (Appendix 7, Tables 28A and 29A) displayed similar factor loadings on most of the variables, the only exception was

that the OBLIMIN rotation determined five variables (a07, a09, a11, b04, c02, c13) as insignificant, and the VARIMAX rotation determined that these variables were significant and loaded on Factor 1 (a07, a11), Factor 2 (c02, c13), Factor 7 (b04), and Factor 8 (a09).

Although the significance of the variable loadings was slightly different, and the significance of the loadings changed slightly between rotations, the variables consistently loaded on the same factors for both VARIMAX and OBLIMIN rotations. Therefore, the final factorial structure was based on the VARIMAX rotation method as the VARIMAX considered the factors as independent (Hair et al., 1998).

5.4.2.4 Interpretation of Factors

Hair et al. (1998) suggested that for a sample size of approximately 200, factor loadings greater $\pm .40$ should be considered significant. VARIMAX considered all variables significant, and six variables (b02, b04, c02, c04, c11, c13) had significant loadings on two factors. The remaining 38 variables had one loading on one factor (see Appendix 8 for details of the variable loadings). Each factor was subsequently named in accordance to the construct that they represented. The ten factors were named: (1) Academic Staff; (2) Academic Development; (3) Physically Appealing; (4) Administration Staff; (5) Personal Development; (6) Library; (7) Career Opportunities; (8) Course Content; (9) Social Factors; (10) Academic Staff Availability.

5.4.3 Summated Scale

In order to summate the items, the content validity, dimensionality, and reliability of the measurement scales were assessed.

5.4.3.1 Content Validity

All variables (items) were inspected by the researcher to ensure that they were an adequate and a thorough representation of the construct under investigation. In the final rotation, all the

items did not load exactly on the sixteen sub-dimensions that were originally proposed to represent the primary dimensions. However, these items did load on the primary dimensions that were originally proposed. The only exception was the items under Course Content (b01, b02, b03). Course Content that loaded on the Interaction Quality dimension was originally proposed as a sub-dimension of Physical Environment Quality. It was therefore concluded that the items exhibited adequate content validity.

5.4.3.2 Dimensionality

As noted in Section 5.4.3, six variables had two significant factor loadings, indicating that these variables were associated with two factors. However, four of these variables (b02, c02, c04, c11) highly loaded on one factor, and moderately loaded on the different factors in the component matrix, hence these four variables were included to represent the most highly loaded factor. The other two variables (b04, c13) moderately loaded on two factors, and could not be considered as highly associated with any particular factor and therefore they were excluded. The outcome of this process resulted forty two variables representing ten factors.

5.4.3.3 Reliability

The remaining forty two variables were subjected to reliability tests, except for the variable a10 that represented only one factor. The Cronbach's Coefficient Alpha was used to measure reliability. All of the factors have a Cronbach's Coefficient Alpha greater than .60, as recommended by Churchill (1979) for explanatory research. The variables used in the summated scale and their Cronbach's Coefficient Alpha are summarised in Table 5.5, 5.6 and 5.7.

Table 5.5: Reliability of Scaled Items for Interaction Quality.

Sub-Dimension	Cronbach's Alpha	Item No.	Items	Rotation Loadings
Academic Staff	0.909	a04	Lecturers' Knowledge	0.753
		a01	Academic staff are polite and courteous	0.701
		a05	Lecturers' teaching ability	0.700
		a03	Students feel comfortable talk to lecturers	0.694
		a06	Preparation and organisation of classes	0.666
		a08	Lecturers and support staff are willing to help	0.653
		a02	Opportunity to participate in class discussions	0.621
		a07	Academic staff are concerned about student welfare and interests	0.516
		a11	Minimum contact difficulty of lecturers	0.432
Administration Staff	0.912	a14	Administration staff are courteous	0.819
		a12	Administration staff are sympathetic and reassuring	0.784
		a13	Administration staff solve my problems at a promised time	0.760
Academic Staff Availability		a10	Lecturer's Office Hours	0.661
Course Content	0.782	b01	Useful course materials	0.721
		b02	Relevant course materials	0.699
		b03	Interesting course materials	0.664
		a09	Prompt Return of the works	0.404

Table 5.6: Reliability of Scaled Items for Physical Environment Quality.

Sub-Dimension	Cronbach's Alpha	Item No.	Items	Rotation Loading
Library Atmosphere	0.847	b06	Relevant information provided when required	0.792
		b07	Problems solved at a promised time	0.762
		b05	Quiet library to study	0.745
Physically Appealing	0.834	b10	Comfortable lecture rooms	0.731
		b11	Quality equipment in lecture rooms	0.722
		b13	Campus facilities (e.g. parking, accomodation, café)	0.636
		b12	The university has an excellent physical layout	0.574
		b09	Quality equipment in computer labs	0.539
		b08	Computer Accessibility	0.472
Social Factors	0.779	b14	Attitude of students sitting nearby	0.888
		b15	Disturbances during the lecture	0.851

Table 5.7: Reliability of Scaled Items for Outcome Quality.

Sub-Dimension	Cronbach's Alpha	Item No.	Items	Rotation Loadings
Personal Development	0.793	c06	Understand people of other racial and ethnic background better	0.709
		c05	Developed personal code of values and ethics	0.697
		c08	Ability to function as a member of a team	0.587
		c01	Acquired a broad general education in different fields	0.489
Academic Development	0.882	c14	Become more competent in one's field of study	0.685
		c07	Ability learn effectively on oneself, pursue ideas, and find the required information	0.638
		c12	Gained specific computing and information technology techniques	0.601
		c04	Ability to analyse quantitative problems	0.597
		c15	Achieved ones' own expected grades	0.589
		c03	Developed writing and speaking skills	0.549
Career Opportunities	0.812	c02	Developed analytical and logical thinking	0.506
		c10	Gained some knowledge and skills for a particular career	0.769
		c09	Guidance and information on career opportunities at university	0.711
		c11	Gained knowledge and skills for first job	0.607

In addition to the reliability tests conducted on the summated scale of the sub-dimensions, reliability tests were also performed on the Service Quality, Satisfaction, Image, Price, and Future Attendance summated scales. The items that were used in the summated scale are shown in Table 5.8. The scores of Cronbach's Coefficient Alpha of these constructs were all above 0.60, as recommended by (Churchill, 1979), hence it was concluded that these measures also demonstrated reliability.

Table 5.8: Reliability of Scaled Items for Satisfaction and Related Constructs.

Construct	Cronbach's Alpha	Items
Service Quality	0.785	Excellent service quality Superior service quality Overall service quality
Satisfaction	0.867	Satisfying experience Overall satisfaction Feel to the university
Image	0.906	Personal impression about the university General university image to students Fulfills promises made to students University's reputation
Price	0.932	University's tuition fees Good value for money
Future Attendance	0.855	Intention to choose same university Intention to continue for further studies at the same university

All of the summated scales were judged to demonstrate sufficient content validity, unidimensionality, and reliability for a newly developed questionnaire. The mean of each of the scales was then used to represent each one of the dimensions identified in Tables 5.5, 5.6, 5.7 and 5.8 for further analysis.

5.5 Assessment of Multiple Regression and ANOVA

5.5.1 Assumptions for Regression Analysis and ANOVA

A series of statistical assumption tests were assessed for each of the eight multiple regression models to ensure a robust result.

5.5.1.1 Outliers

Each one of the eight regression models was examined to ensure that outliers were not present. Outliers are identified as the observations whose standardised residual is greater than 3. As recommended by Maddala (2001), outliers were removed from the analysis in order to reduce the effects of their influence on the performance of the regression models. .

5.5.1.2 Multicollinearity

Multicollinearity was assessed for each regression equation. Initial inspection of the Pearson Correlation Matrix (Appendix 9, Tables 31A – 38A) for each of the regression models shows that the correlations between the independent variables did not exceed 0.80. Moreover, the R^2 values for the eight models were not exceedingly large. The F-values for all the models are highly significant, individual t-values are also significant except for only two variables in separate models.

Collinearity statistics (see Appendix 9, Table 39A) were also assessed for all of the regression models. The VIF values for all independent variables in each model were lower than 4 and less than $1/(1 - R^2)$, indicating that the independent variables were related to the dependent variables more than to each other, hence multicollinearity was deemed to be not a serious problem. Moreover, the tolerance values were all above 0.20, and all of the independent variables in each model had conditional indices lower than 15. In summary, the collinearity statistics indicated that no multicollinearity problems occurred in any of the regression models used in this study.

5.5.1.3 Linearity

The scatter plot of standardised residuals versus the fitted values (see Appendix 10, Figure 9A) for all eight regression models were visually inspected. The plots did not show any systematic pattern, thus providing support for the specified linear relationship.

5.5.1.4 Error Term Normality

Both histogram residual plots and the normality probability plots were plotted to assess normality (see Appendix 11, Figures 10A and 11A). The histogram plots show that the distribution approximates the normal distribution, and that the P-P plots are approximately a straight line and not curvature. Therefore, the residuals were deemed to have a reasonable normal distribution.

5.5.1.5 Error Term Independence

The Durbin-Watson test was computed to diagnosis error term independence, the test value and the corresponding critical value are summarised in Table 5.9.

Table 5.9: Durbin-Watson Test Statistics.

Model	Dependent Variable	Test Statistic	Critical Value (at 1% level)	
			DL	DU
1	Interaction Quality	1.909	1.633	1.715
2	Physical Environment Quality	1.899	1.643	1.704
3	Outcome Quality	1.992	1.643	1.704
4	Service Quality	1.906	1.633	1.715
5	Price	1.773	1.664	1.684
6	Satisfaction	1.722	1.643	1.704
7	Future Attendance	2.030	1.664	1.684
8	Recommend Service	1.880	1.664	1.684

The Durbin-Watson test statistics for each of the eight models are greater than the DU, indicating the there was no autocorrelation in the residuals. Therefore, the assumption of error term independence was satisfied.

5.5.1.6 Error Term Homoscedasticity

The error terms are expected to have equal variances. In the scattered residual plots (Appendix 10, Figure 9A), the residual appeared scattered randomly about the zero line and not exhibiting a triangular-shaped pattern, thus provided sufficient evidence to satisfy the error term homoscedasticity assumption.

5.5.2 Results Pertaining to Research Objective 1 (Hypothesis 1 through 6)

This section presents the results relating to Hypotheses 1 through 6 that were formulated in order to achieve Research Objective 1. Hypotheses 1, 2, and 3 were proposed to test the second-order of the hierarchical model. The summated scaled sub-dimensions were regressed against their pertaining primary dimensions as derived from the literature review, perceived by the focus group respondents, determined by the researcher, and confirmed by the exploratory factor analysis. Hypotheses 4, 5, and 6 were proposed to test the first-order of the hierarchical model, therefore, the primary dimensions were regressed against Total Service Quality.

5.5.2.1 Hypothesis 1

The regression model for Hypothesis 1 has Interaction Quality as the dependent variable and its pertaining sub-dimensions as the independent variables. Four sub-dimensions that relate to Interaction Quality were identified, namely, Academic Staff, Administration Staff, Academic Staff Availability, and Course Content. The results relating to Hypothesis 1 are presented in Table 5.10.

Table 5.10: Model 1: Multiple Regression Results Relating to Hypothesis 1.

MODEL 1	Unstandardised		Standardised Coefficients Beta	t	Sig.	
	Coefficients B	Std. Error				
Interaction Quality						
constant	0.062	0.147		0.420	0.675	
Academic Staff	0.579	0.079	0.476	7.369	0.000	***
Administration Staff	0.291	0.048	0.311	6.091	0.000	***
Academic Staff Availability	0.028	0.040	0.033	0.711	0.478	
Course Content	0.136	0.068	0.115	1.990	0.048	**

Adjusted $R^2=0.658$

F=106.140***

*** Significant at 1% level

** Significant at 5% level

* Significant at 10% level

The F statistic is 106.140 at 1% level of significance, indicating that at least one of the independent variables helps explain some of the variation in Interaction Quality. Further, the adjusted coefficient of determination reveals that 65.8% of the variation in Interaction Quality

is explained by the regression model. The p-values of the t-tests were less than 1% level of significance for Academic Staff and Administration Staff, and less than 5% level of significance for Course Content, showing that the beta coefficients of these three sub-dimensions are significant, and explain some of the variation in Interaction Quality. However, the p-value of the t-test were greater than the 10% level of significance for Academic Staff Availability, showing that when the other sub-dimensions are included in the model, the beta coefficient of Academic Staff Availability sub-dimension does not help explain the additional variation in Interaction Quality. Therefore, the results only partially support Hypothesis 1.

5.5.2.2 Hypothesis 2

The regression model for Hypothesis 2 has Physical Environment Quality as the dependent variable and pertaining sub-dimensions as the independent variables. Three sub-dimensions that relate to Physical Environment Quality were identified, namely, Library, Physically Appealing, and Social Factors. The results relating to Hypothesis 2 are presented in Table 5.11.

Table 5.11: Model 2: Multiple Regression Results Relating to Hypothesis 2.

MODEL 2	Unstandardised		Standardised Coefficients Beta	t	Sig.	
	Coefficients B	Std. Error				
Physical Environment Quality						
constant	0.023	0.158		0.145	0.884	
Library	0.197	0.044	0.218	4.484	0.000	***
Physically Appealing	0.656	0.052	0.629	12.677	0.000	***
Social Factors	0.106	0.035	0.124	3.042	0.003	***
Adjusted R²=0.656	*** Significant at 1% level					
F=140.175***	** Significant at 5% level					
	* Significant at 10% level					

The F statistic is 140.175 at 1% level of significance, which means that the model explains some of the variation in Physical Environment Quality. Further, the adjusted coefficient of determination reveals that 65.6% of the variation in Physical Environment Quality is explained by the regression model. The p-values of the t-tests are less than the 1% level of

significance for Library and Physically Appealing, and less than the 5% level of significance for Social Factor showing that the beta coefficients of these three sub-dimensions are significant in explaining Physical Environment Quality. Therefore, Hypothesis 2 is supported by the results of the statistical analysis.

5.5.2.3 Hypothesis 3

The regression model for Hypothesis 3 has Outcome Quality as the dependent variable and pertaining sub-dimensions as the independent variables. Three sub-dimensions that relate to Outcome Quality were identified, namely, Personal Development, Academic Development, and Career Opportunities. The results relating to Hypothesis 3 are presented in Table 5.12.

Table 5.12: Model 3: Multiple Regression Results Relating to Hypothesis 3.

MODEL 3	Unstandardised		Standardised Coefficients Beta	t	Sig.	
	Coefficients B	Std. Error				
Outcome Quality						
constant	-0.348	0.185		-1.885	0.061	
Personal Development	0.234	0.085	0.170	2.751	0.006	***
Academic Development	0.780	0.093	0.571	8.350	0.000	***
Career Opportunities	0.147	0.066	0.125	2.248	0.026	**
Adjusted R²=0.629	*** Significant at 1% level					
F=120.521***	** Significant at 5% level					
	* Significant at 10% level					

The F statistic is 120.521 at 1% level of significance, indicating that the at least one of the independent variables helps explain some of the variation in Outcome Quality. Further, the adjusted coefficient of determination reveals that 62.9% of the variation in Outcome Quality is explained by the regression model. The p-values of the t-tests were less than the 1% level of significance for Personal Development and Academic Development, and less than the 5% level of significance for Career Opportunities, showing that these variables explained some of the variation in Outcome Quality. Therefore, the results support Hypothesis 3.

5.5.2.4 Hypotheses 4 to 6 and 10

Model 4 has the independent variables, Interaction Quality, Physical Environment Quality, and Outcome Quality, and they are regressed against Service Quality. In addition to the primary dimensions, the Image construct is also included as an independent variable to test its effect on Service Quality (Hypothesis 10). The results relating to Hypothesis 4, 5, 6, and 10 are presented in Table 5.13.

Table 5.13: Model 4: Multiple Regression Results Relating to Hypotheses 4, 5, 6 and 10.

MODEL 4	Unstandardised		Standardised Coefficients Beta	t	Sig.	
	Coefficients B	Std. Error				
Service Quality						
constant	0.842	0.159		5.290	0.000	
Interaction Quality	0.278	0.055	0.309	5.033	0.000	***
Physical Environment Quality	0.166	0.060	0.180	2.739	0.007	***
Outcome Quality	0.222	0.057	0.266	3.915	0.000	***
Image	0.142	0.046	0.166	3.083	0.002	***
Adjusted R²=0.571		*** Significant at 1% level				
F=74.257***		** Significant at 5% level				
		* Significant at 10% level				

F statistic equal to 74.257 is significant at 1% level of significance. Therefore, the independent variables help to explain some of the variation in Service Quality. Further, the adjusted coefficient of determination reveals that 67.1% of the variation in Service Quality is explained by the regression model. The p-values of the t-tests were less than the 1% level of significance for Interaction Quality, Physical Environment Quality, Outcome Quality, and Image. Since all primary dimensions and image are significant, these variables each help explain some of the variation in Service Quality. Accordingly, Hypotheses 4, 5, 6, and 10 are all supported by the statistical analysis.

5.5.2.5 Discussion Regarding Research Objective 1

There are nine significant sub-dimensions of service quality as perceived by students at Lincoln University. These are Academic Staff, Administration Staff, Course Content, Library, Physically Appealing, Social Factors, Personal Development, Academic Development, and

Career Opportunity. The beta coefficients suggest that increase in these sub-dimensions will positively affect their pertaining primary dimensions. The effect of Academic Staff Availability on Interaction Quality is insignificant, suggesting increasing the performance on this sub-dimension may not positively affect the Interaction Quality performance.

The support found for Hypotheses 4, 5, and 6 provides further evidence for the use of Interaction Quality, Physical Environment Quality, and Outcome Quality as primary dimensions of service quality in the context of higher education. Further, the results of Hypotheses 1 through 6 suggest that there is support for a hierarchical factor structure of service quality for higher education.

5.5.3 Results Pertaining to Research Objective 2

This section presents the statistical results of Hypotheses 7, 8, 9, and 11 in order to achieve Research Objective 2. Research Objective 2 examines the relationships between Satisfaction, Service Quality, Price, and Image.

5.5.3.1 Hypothesis 8

For Hypothesis 8, the relationship between Price and Service Quality was examined, the results relating to Hypothesis 8 are presented in Table 5.14.

Table 5.14: Model 5: Multiple Regression Results Relating to Hypotheses 8.

MODEL 5	Unstandardised		Standardised Coefficients Beta	t	Sig.
	Coefficients B	Std. Error			
Price					
constant	1.545	0.318		4.853	0.000
Service Quality	0.812	0.092	0.509	8.801	0.000

Adjusted R²=0.256

F=77.465***

*** Significant at 1% level

** Significant at 5% level

* Significant at 10% level

F statistic equal to 77.465 is significant at 1% level of significance. Therefore, the independent variable helps to explain some of the variation in Price. Further, the adjusted

coefficient of determination reveals that 25.6% of the variation in Price is explained by the regression model. The p-value of the t-test was less than the 1% level of significance for Service Quality. Therefore, Hypothesis 8 is statistically supported.

5.5.3.2 Hypotheses 7, 9, and 11

Model 7 examines the constructs that may affect students' satisfaction. Consequently, three hypotheses relating to Service Quality, Image, and Price were tested. The results relating to Hypotheses 7, 9, and 11 are summarised in Table 5.15.

Table 5.15: Model 6: Multiple Regression Results Relating to Hypotheses 7, 9, and 11.

MODEL 6	Unstandardised		Standardised Coefficients Beta	t	Sig.	
	Coefficients B	Std. Error				
Satisfaction						
constant	-0.348	0.145		-2.392	0.018	
Service Quality	0.909	0.046	0.809	19.706	0.000	***
Image	0.080	0.045	0.077	1.780	0.077	*
Price	0.025	0.030	0.036	0.843	0.400	
Adjusted R²=0.758	*** Significant at 1% level					
F=229.134***	** Significant at 5% level					
	* Significant at 10% level					

F statistic equal to 229.134 is significant at 1% level of significance. Therefore, the independent variables help to explain some of the variation in Satisfaction. Further, the adjusted coefficient of determination reveals that 75.8% of the variation in Satisfaction is explained by the regression model. The p-values of the t-tests were less than 1% level of significance for Service Quality, and less than 10% level of significance for Image, showing that the beta coefficients of these two independent variables are significant, and explain some of the variation in Satisfaction. However, the p-value of the t-tests were greater than the 10% level of significance for Price, showing that when the other independent variables are included in the model, the beta coefficient of Price does not help explain the additional variation in Satisfaction. Therefore, while Hypotheses 7 and 11 are supported, Hypothesis 9 is not supported.

5.5.3.3 Discussion Regarding Research Objective 2

In addition to Service Quality being positively influenced by students' perceptions of the three primary dimensions, the t-statistic for Image shows a significant positive effect. However, the beta coefficient of Image (0.166) suggests that Image is not perceived as important to Service Quality as Interaction Quality ($\beta= 0.309$), Outcome Quality ($\beta= 0.266$) or Physical Environment Quality ($\beta=0.180$) by students.

The t-statistic for Service Quality shows that increasing favourable perceptions of Service Quality ($\beta= 0.509$) positively influence perceptions of Price, and as well, positively influences Satisfaction. The t-statistic Satisfaction is also positively influenced by Image, but is not influenced by the perceptions of Price. The standardised coefficients of Service Quality, Price, and Image explain Satisfaction numerically, and identify that Service Quality ($\beta= 0.809$) has the most influential effect on Satisfaction, followed by Image ($\beta= 0.077$), and Price ($\beta= 0.036$) has the least effect.

5.5.4 Results Pertaining to Research Objective 3

Research Objective 3 is related to the relationship between Satisfaction and favourable future behavioural intentions. Consequently, Hypothesis 12 and 13 are tested in order to achieve Research Objective 3.

5.5.4.1 Hypothesis 12

Hypothesis 12 is related to Future Attendance and Satisfaction. The results related to Hypothesis 12 are presented in Table 5.16.

Table 5.16: Model 7: Multiple Regression Results Relating to Hypotheses 12.

MODEL 7	Unstandardised		Standardised Coefficients Beta	t	Sig.
	Coefficients B	Std. Error			
Future Attendance					
constant	1.439	0.246		5.839	0.000
Satisfaction	0.784	0.076	0.574	10.365	0.000

Adjusted R²=0.326 *** Significant at 1% level
F=107.438*** ** Significant at 5% level
* Significant at 10% level

F statistic equal to 107.438 is significant at 1% level of significance. Therefore, the independent variable helps to explain some of the variation in Future Attendance. Further, the adjusted coefficient of determination reveals that 32.6% of the variation in Future Attendance is explained by the regression model. The p-value of the t-test was less than the 1% level of significance for Satisfaction. Therefore, Hypothesis 12 is statistically supported.

5.5.4.2 Hypothesis 13

Hypothesis 13 tested the final relationship path of the proposed model, that is, Satisfaction and Recommendation. The result relating to Hypothesis 13 is presented in the Table 5. 17.

Table 5.17: Model 8: Multiple Regression Results Relating to Hypotheses 13.

MODEL 8	Unstandardised		Standardised Coefficients Beta	t	Sig.
	Coefficients B	Std. Error			
Recommend					
constant	0.756	0.250		3.023	0.003
Satisfaction	0.958	0.077	0.644	12.471	0.000

Adjusted R²=0.411 *** Significant at 1% level
F=155.528*** ** Significant at 5% level
* Significant at 10% level

F statistic equal to 155.528 is significant at 1% level of significance. Therefore, the independent variable helps to explain some of the variation in Recommend. Further, the adjusted coefficient of determination reveals that 41.1% of the variation in Recommend is explained by the regression model. The p-value of the t-test was less than the 1% level of significance for Satisfaction. Therefore, Hypothesis 13 is statistically supported.

5.5.4.3 Discussion Regarding Research Objective 3

An enhanced level of Satisfaction reinforces the decision to positively consider Future Attendance at the same university, as well as increasing the intention to Recommend the university to others. However, the adjusted R^2 for the Future Attendance (32.6%) and Recommend (41.1%) Models are not very high, indicating that a proportion of the variations in Future Attendance and Recommend are not explained by the regression models.

5.5.5 Hypothesis Pertaining to Research Objective 4

Multiple regression Models 1, 2, 3, and 4 were used in order to identify the least and most important Service Quality dimensions as perceived by students. The results are presented in Table 5.14, 5.15, 5.16., and 5.17.

5.5.5.1 Hypothesis 14

Hypothesis 14a postulated that students perceive each of the three primary dimensions to be more or less important, and this is supported by the statistical results. The most important primary dimension perceived by students was Interaction Quality ($\beta= 0.309$), followed by Outcome Quality ($\beta= 0.266$), and Physical Environment Quality ($\beta= 0.180$) that was perceived as the least important dimension of the three primary dimensions.

Hypothesis 14b postulated that the sub-dimensions pertaining to the three primary dimensions would vary in importance. This information is summarised in Figure 5.2, which lists all the standardised beta coefficient of the eight regression models.

5.5.5.2 Discussion Regarding Research Objective 4

The three primary dimensions, Interaction Quality, Physical Environment Quality and Outcome Quality vary in terms of their importance to overall Perceived Service Quality. In addition, each of the pertaining sub-dimensions also varies in importance to each of the primary dimensions. The statistical results of eight regression models are illustrated in Figure

5.2, with the standardised coefficients (rounded-up) listed next to all the significant paths.

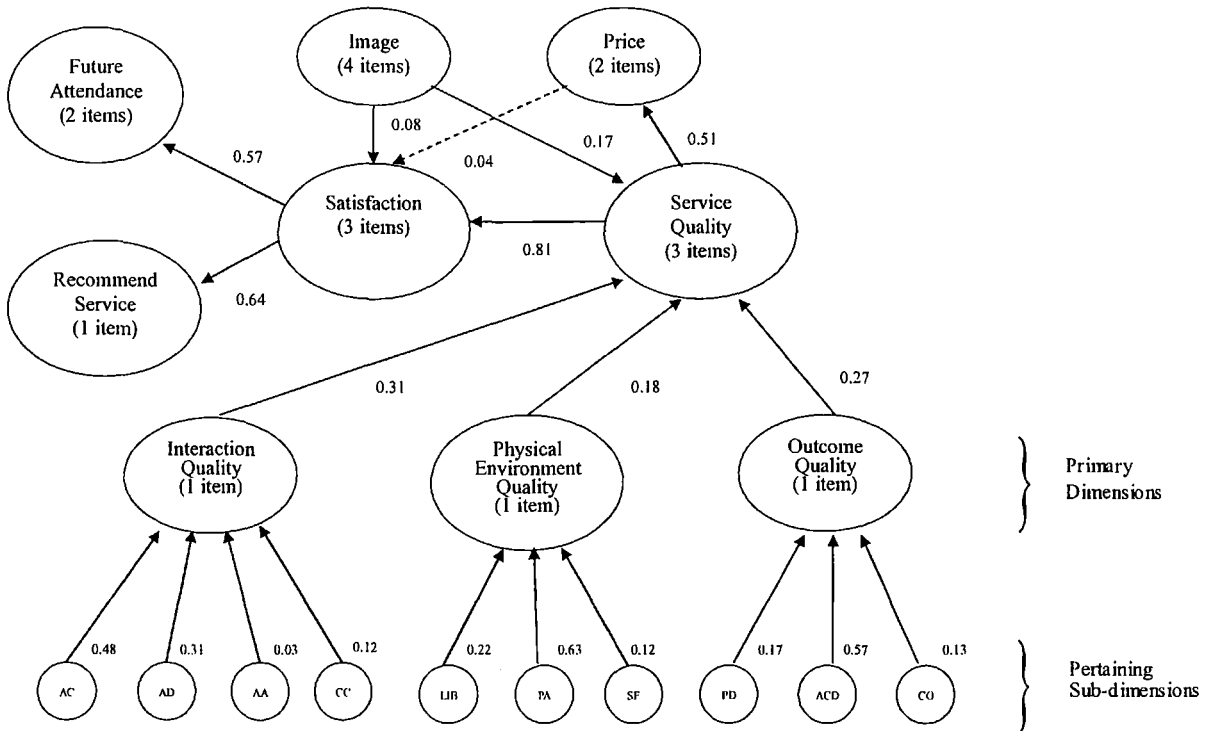


Figure 5.2: University Student Satisfaction: Path Model.

Interaction Quality is perceived as the most important primary dimension and it has three significant and one insignificant sub-dimension. Academic Staff is perceived as the most important sub-dimensions, followed by Administration Staff, and Course Content. The sub-dimension, Academic Staff Availability is insignificant, but it does have a small impact on the perceptions of Interaction Quality.

Outcome Quality is perceived as the second most important primary dimension of Service Quality and it has three significant sub-dimensions. The most important sub-dimension perceived by students is Academic Development, followed by Career Opportunities, and Personal Development.

Lastly, Physical Environment Quality is perceived as the least important dimension of the three Service Quality Primary Dimensions. Physical Environment Quality also has three

significant sub-dimensions, Physically Appealing being the most important, followed by Library, and Social Factors.

5.5.6 Hypothesis Pertaining to Research Objective 5

In order to achieve Research Objective 5, Hypothesis 15 has been formulated to test if there are differences between groups based on the demographic characteristics of the respondents. One crucial assumption for an analysis of variance to be effective is that the groups being compared must be of a similar sample size. The groups; Gender, Major and Year of Study meet this criteria. However, the Age and Ethnic Groups have disproportionate sample sizes. Therefore, to obtain a reliable statistical result, the age groups were combined into two groups, 18 to 24 years and 25 years and over. The ethnic groups were also combined into two groups, Western and Asian.

5.5.6.1 Hypothesis 15a

Hypothesis 15a postulates that there is no perceptual difference between Satisfaction, Service Quality, Image, Price, Future Attendance, and Recommendation among the Gender, Age, Ethnicity, Major, and Year of Study Groups. The F statistics (See Appendix 12, Table 40A) show that there are no perceptual differences between males and females, age 18-24 years and 25 years and over, and majors. For the Western and Asian ethnic groups, except for the Image construct, the means of the Service Quality, Satisfaction, Price, Future Attendance and the Recommendation constructs are significantly different. There is also a mean differences on Future Attendance (5% level) and Recommendation (10% level) between the year two and year three students. Table 5.18 summarised the ANOVA results relating to Hypothesis 15a, the significant perceptual differences are indicated.

Table 5.18: ANOVA Results Relating to Hypothesis 15a.

	Gender	Age	Ethnicity	Major	Year of Study
Service Quality			***		
Satisfaction			***		
Image					
Price			***		
Future Attendance			**		**
Recommend			***		*

*** Significant at 1% level

** Significant at 5% level

* Significant at 10% level

5.5.6.2 Hypothesis 15b

Hypothesis 15b postulates that there are no perceptual differences of the Primary Dimensions, Interaction Quality, Physical Environment Quality and Outcome Quality among the Gender, Age, Ethnicity, Major, and Year of Study Groups. Of these five demographic groups, the Physical Environment Quality dimension is perceived differently by Western and Asian students at 1% level of significance. In addition, the Outcome Quality and Interaction Quality dimension are perceived differently between year two and year three students at 5% and 1% level of significance respectively (See Appendix 12; Table 41A). There is no perceptual differences between the remaining groups. Table 5.19 summarised the ANOVA results relating to Hypothesis 15b, the significant perceptual differences are indicated.

Table 5.19: ANOVA Results Relating to Hypothesis 15b.

	Gender	Age	Ethnicity	Major	Year of Study
Interaction Quality					*
Physical Environment Quality			**		
Outcome Quality					**

*** Significant at 1% level

** Significant at 5% level

* Significant at 10% level

5.5.6.3 Hypothesis 15c

Hypothesis 15c postulates that there are no perceptual differences of the sub-dimensions that pertain to the primary dimensions between the gender, age, ethnicity, major, and year of study groups. The results show no perceptual differences of the sub-dimensions within the age groups. However, the gender, ethnicity, major, and year of study do perceive differences in some of the sub-dimensions (see Appendix 12, Table 42A).

The F-statistics of the sub-dimensions indicate that there are perceptual differences of the Social Factors between male and female groups (0.10 level of significant) and the Academic Staff Availability within the major groups (0.10 level). There are perceptual differences of Social Factors (0.10 level), Academic Development (0.05 level), and Career Opportunity (0.01) sub-dimensions between Western and Asian students. In addition, Year 2 and Year 3 study groups had perceptual differences of four sub-dimensions; Academic Staff (0.05 level), Course Content (0.01 level), Personal Development (0.01 level), and Academic Development (0.01 level). Table 5.20 presents summary of ANOVA results relating to Hypothesis 15c, the significant perceptual differences are indicated.

Table 5.20: ANOVA Results Relating to Hypothesis 15c.

	Gender	Age	Ethnicity	Major	Year of Study
Academic Staff					**
Administration Staff					
Course Content					***
Library					
Physical Appealing					
Social Factors	*		*		
Personal Development					***
Academic Development			***		***
Career Opportunities			***		

*** Significant at 1% level

** Significant at 5% level

* Significant at 10% level

5.5.6.4 Discussion Regarding Research Objective 5

The five demographic groups, Gender, Age, Ethnicity, Major, and Year of Study, Age and Major groups perceive no differences of the sub-dimensions and primary dimensions of Service Quality, Service Quality, Price, Image, Satisfaction, Future Attendance, and Recommendation. Gender groups have no mean differences of all constructs except Social Factor sub-dimension between male and female. Major groups also have no perceptual differences of all constructs except Academic Staff Availability. Similarly, the Year of Study groups do have perceptual differences of the sub-dimensions, namely, Academic Staff, Course Content, Personal Development, and Academic Development. In addition, Outcome Quality, Future Attendance, and Recommendation are perceived differently by these groups. The Western and Asian ethnic groups have perceptual differences of the sub-dimensions, Social Factors, Academic Development, and Career Opportunities. In addition, Western and Asian groups have perceptual differences of Physical Environment Quality, Service Quality, Satisfaction, Future Attendance, and Recommendation.

5.6 Chapter Summary

This chapter presented the results based on the research plan and the methodology outlined in Chapter Four. A preliminary examination of the data set indicates that the questionnaire is reliable and valid. In addition, examination of the data set indicates that the statistical assumptions required to perform factor analysis, multiple regression analysis and analysis of variance have been met.

Using principle components factor analysis, the original sixteen sub-dimensions proposed to represent service quality were reduced to 10 sub-dimensions. Each path in the conceptual model (presented in Section 3.3) was subsequently tested using eight multiple regression models. Hypothesis 1 was partially supported, and Hypothesis 9 was not supported, the remaining 12 hypotheses were supported by the statistical results. Hypothesis 15 related to the

different perceptions that may exist between demographic groups shows that of all the groups, the Ethnicity and Year of Study Groups have the most perceptual differences within their groups. The remaining demographic groups have the minimal perceptual differences within their groups.

Chapter 6: Conclusions and Implications

6.1 Introduction

This chapter provides a summary of the research, reviews the findings, and reports several conclusions based on the results and discussion presented in Chapter Five. The theoretical and managerial contributions, limitations, and avenues for future research are also discussed.

6.2 Summary of the Study

The literature review presented in Chapter Two suggests that the hierarchical factor structure for measuring and conceptualising service quality in other service industries may also be appropriate for use in higher education. The literature review, the focus groups, and the statistical analysis add support for the presence of a hierarchical structure and support the three primary dimensions underlying service quality in higher education organisations, namely, Interaction Quality, Physical Environment Quality, and Outcome Quality.

While the three primary dimensions of service quality may be appropriate for use across industries and cultures, several researchers (Dabholkar et al., 1996; Van Dyke, Keppelman, and Prybutok, 1997) commented that service quality sub-dimensions should be developed specifically to suit the industry due to the inability to identify a common set of sub-dimensions. In agreement with the contention of these researchers, this study has identified the service quality sub-dimensions of higher education in New Zealand, as perceived by students.

Several constructs related to service quality were identified in the literature review. Service quality has been related to; satisfaction (Rust and Oliver, 1994; Cronin and Taylor, 1994; Parasuraman et al., 1994), and price (Caurana, Money, and Berthon, 2000; Bolton and Drew,

1991; Zeithaml, 1988). Favourable future behavioural intentions have been related to satisfaction (Zeithaml et al., 1996; Boulding et al., 1993). In the case of higher education, image was viewed as perceived excellence (Gavin, as cited by Kotler and Fox, 1995) and has been related to service quality and satisfaction (Nguyen and LeBlanc, 1998; Andressen and Lindastad, 1998). Accordingly, this study analysed each of these constructs and the relationships between them.

In addition, several researchers (Ham, 2003; Clemes et al., 2001; Ford et al., 1999) suggested that the perceptions of service quality not only vary across industries but it also differs due to the demographic characteristics of consumers. Therefore, the constructs have also been examined based on the respondents' gender, age, ethnicity, major and year of study.

In order to achieve a better understanding of students' perceptions of service quality and their effects of these perceptions on the related constructs such as satisfaction, price, image, and favourable future intentions, five research objectives were identified in this study:

- (1) To identify the service quality dimensions as perceived by students in the New Zealand higher education sector.
- (2) To determine the effects of the dimensions of perceived service quality and other influential factors on students' overall satisfaction.
- (3) To examine the relationship of students' overall satisfaction with favourable future behavioural intentions.
- (4) To identify the least and most important service quality dimensions as perceived by students in higher education in New Zealand.
- (5) To examine the effects of demographic factors on students' satisfaction and related constructs.

These five research objectives were addressed by testing 15 hypotheses, developed in Chapter Three, Hypotheses 1 through 6 relate to Research Objective 1, Hypotheses 7 through 11 relate to Research Objective 2, Hypotheses 12 and 13 relate to Research Objective 3, Hypothesis 14 relates to Research Objective 4, and Hypothesis 15 relates to Research Objective 5.

6.3 Conclusions Pertaining to Research Objective 1

Research Objective One was achieved. The dimensions of service quality, as perceived by students at Lincoln University, New Zealand, were identified. The primary dimensions of service quality are Interaction Quality, Physical Environment Quality, and Outcome Quality, as identified in the literature review, supported by the focus group research, and supported by the statistical analysis. The findings specifically support the presence of a hierarchical factor structure of service quality (Brady and Cronin, 2001) for higher education.

The results of the statistical analysis reduced the sixteen sub-dimensions originally proposed to ten sub-dimensions. The ten sub-dimensions are: Academic Staff, Administration Staff, Academic Staff Availability, Course Content, Library, Physically Appealing, Social Factors, Personal Development, Academic Development, and Career Opportunities. The number of sub-dimensions are not equal to the number of sub-dimensions identified by Brady and Cronin (2001) and Collins (2005). This finding supports the contention of earlier studies (Van Dyke et al., 1997) that have identified different factor structures across services industries. Some of the sub-dimensions are also different in content than the sub-dimensions identified for several other services (for example, see Collins, 2005; Brady and Cronin, 2001; Dabholkar et al., 1996).

However, the ten sub-dimensions identified in this study are similar in content to the dimensions factored by other researches that have focused on higher education (DeShields et al., 2005; Clemes et al., 2001; Oldfield and Baron, 2000; Athiyaman, 1997). However, the ten

sub-dimensions do differ in number from other higher education studies (Athiyaman, 1997; Cuthbert, 1996a, b).

The different sub-dimensional factor structure supports the view that the dimensionality of the service quality construct is dependent on the service industry under investigation, and adds support to the claims that industry and cultural-specific measures of service quality need to be developed to identify different dimensional structures (Clemes et al., 2001; Dabholkar et al., 1996).

There are three primary dimension identified in this study; Interaction Quality, Physical Environment Quality, and Outcome Quality. Several studies on service quality in higher education (see Section 2.6) have focused on teacher and students' interaction and the physical facilities of the university. This study adds empirical support to this vein of literature and identifies Interaction Quality and Physical Environment Quality as important dimensions when assessing service quality in higher education institutions. However, the statistical significance of Outcome Quality as an explanatory variable provides additional empirical support for the study by Tam (2006) who suggests that outcomes are also an important aspect to consider when assessing students' university experiences.

6.4 Conclusions Pertaining to Research Objective 2

Research Objective Two only partially achieved as Hypotheses 7, 8, 10, and 11 are confirmed by the significant positive effects on their related constructs. However, Hypothesis 9 was not confirmed as Price did not significantly influence Satisfaction.

Hypothesis 8 proposed that Price is positively influenced by Service Quality. This result supports the trade-off relationship identified by Zeithaml (1988) and Bolton and Drew (1991) between service quality and price. Moreover, the finding empirically supports those of Caurana et al. (2000), who determined that value (measured in monetary terms) is influenced

by service quality. However, the variation on the perceptions of Price attributed to Service Quality is 25.6%. This finding suggests that there are other unidentified factors that influence the perceptions of Price in higher education.

The statistical analysis indicates that Image has a positive impact on Service Quality ($\beta=0.192$). This finding supports Bloemer, Ruyter and Peeters's (1998) result that perceptions of image had a positive significant effect on service quality. However, the beta coefficient also indicates that the importance of Image on Service Quality is less than the importance of each of the three Primary Dimensions.

The three independent variables; Service Quality, Price and Image explained approximately 73% of the variation in Satisfaction. The strongest positive effect was between Service Quality and Satisfaction ($\beta=0.783$). This result supports the findings of Brady et al. (2002) who determined that service quality was an antecedent of the higher order construct of Satisfaction. Image also has an independent effect ($\beta=0.099$) on satisfaction, supporting Palacio, et al.'s (2002) view that a university's image influences students' level of satisfaction. However, Image's beta coefficient indicates it has only a minor impact on satisfaction in this study. This finding is different from Mai's (2005) finding that 'overall impression of the school' had a strong influence on satisfaction. Additionally, Image also indirectly influences Satisfaction through Service Quality, however, the effect is minimal. Andressen and Lindstad (1998) suggested that image has a larger impact on Satisfaction when people have a lack of knowledge about an organisation through their own experiences. Therefore, the potential of image to influence Satisfaction may be increased or decreased by students' actual university experiences.

Price has an insignificant relationship with Satisfaction. This finding implies that an increase in the perception of price does not have an impact on the level of satisfaction. This finding is

different to the findings of other studies (Caurana et al., 2000; McDougall and Levesque, 2000) that found that perceptions of price had a strong impact on satisfaction.

6.5 Conclusions Pertaining to Research Objective 3

Research Objective Three was achieved as Hypotheses 12 and 13 relating to Satisfaction and students' favourable future behavioural intentions were confirmed. The Intention to Attend the same university in the future is positively influenced by students' level of Satisfaction.

Similarly, the Intention to Recommend the university to other people is also positively influenced by students' level of satisfaction. The result empirically support those of Boulding et al. (1993) and Athiyaman (1997) that maintain improving students' level of satisfaction will increase their favourable behavioural intentions in the future. Further, as Service Quality and Image are positively related to Satisfaction, these constructs can also be seen to have an indirect effect on favourable future behavioural intentions of students. However, the statistic analysis indicates that Satisfaction accounted for only a small amount of the variation in Future Attendance ($R^2 = 32.6\%$) and Recommendation ($R^2 = 41.1\%$). This implies that there are other important antecedents of favourable future behavioural intentions that have not been identified in this study.

6.6 Conclusions Pertaining to Research Objective 4

Research Objective Four was achieved as the least and most important service quality dimensions were identified as perceived by students for a higher education institution in New Zealand.

The primary dimension Interaction Quality was perceived by students as most important, followed by Outcome Quality, and Physical Environment Quality. These findings agree with Cuthbert's (1996a, b) contention that when measuring the overall level of service quality in a

university environment, staff and student interaction factors override physical facility factors. Further, Outcome Quality exerts a stronger impact on Service Quality than Physical Environment Quality, implying that students perceived the learning outcomes of their experiences as more important than the university's facilities and learning environment.

6.7 Conclusions Pertaining to Research Objective 5

Research Objective Five was partially satisfied as the Age Groups perceived no differences on all of the constructs. However, the Gender, Ethnicity, Major, and Year of Study Groups had perceptual differences of several of the constructs.

The statistical results differ from Clemes et al.'s, (2001) study, as in this study Age Groups exhibited no perceptual differences of the dimensions. However, the findings agree with Clemes et al.'s (2001) findings that there were perceptual differences of the Academic Staff Availability within the Major Groups. The findings are also consistent with Clemes et al.'s (2001) finding that there were perceptual differences of the dimensions within the ethnic groups. The perceptual differences within ethnic groups found in both studies are also consistent with other cross-cultural studies on higher education (Mai, 2005; Ford et al., 1999).

The statistical results showed that there were no perceptual differences between the male and female groups, except for the perceptions of the Social Factors sub-dimension. This difference has not been identified in previous higher education studies. The results of this study do support those of other higher education studies that measured male and female perceptual differences (Ham, 2003; Clemes et al., 2001).

The significant result of perceptual differences within the Year of Study Groups revealed in this study adds empirical support to Oldfield and Baron's (2000) research that experiences of students and the course content received by students in different years of study would make

their perceptions of the constructs different.

6.8 Contributions

Achieving the five research objectives of this study makes several contributions to improving the theoretical understanding of the higher education sector. First of all, achieving Research Objective 1 supports Cuthbert's (1996b) call for further research to revisit underlying concepts of the dimensions of service quality in the context of higher education. This study provides a more detailed analysis of students' perceptions of higher education and adds additional information to the existing literature in higher education. Secondly, achieving Research Objective 2 and 3 support LeBlanc and Nguyen's (1997) recommendations to investigate the relationship between satisfaction, service quality, price, image, and favourable future behavioural intentions in the context of higher education. Consequently, this study provides a more comprehensive understanding of the relationships between these constructs. Thirdly, achieving Research Objective 4 supports Chu's (2002) contention that the derived importance of the constructs is more important than their relative importance. Lastly, Research Objective 5 satisfies Marzo-Navarro, Pedraja-Iglesias and Rivera-Torres's (2005) call to analyse the demographic characteristics of students such as age, gender, ethnicity, major, and year of study in relation to constructs such as service quality and satisfaction.

In addition, the research model that was developed for higher education context in a New Zealand setting provides a valuable framework for higher education management to aid them in identifying the variables that are important to students when they evaluate their university experience.

6.8.1 Theoretical Implications

The results of this study add support to the use of a hierarchical factor structure to conceptualise and measure service quality, such as those developed by Brady and Cronin

(2001) and Dabholkar et al. (1996). However, the three primary dimensions may not be generic for all service industries outside of the education sector and for different and cultures. The primary dimensions identified in this study should be confirmed through the use of an appropriate qualitative and quantitative analysis. The sub-dimensions also need to be confirmed using an appropriate qualitative and quantitative analysis as they may vary across industries and cultures. It is also valuable to compare the derived importance of any primary and sub-dimensions that are identified in future research.

Academic Staff Availability was one of the service quality sub-dimension identified in the factor solution. However, it should be noted that this sub-dimension is insignificant in the Regression Model 1 (as discussed in Section 5.5.2.1). This finding is attributed to the open office hour system that many of the Commerce lecturers include as part of their teaching schedule. The majority of students can readily contact their lecturers under the open office hour system and it may function more as a moderating dimension.

The study also provides a framework for understanding the effects of the three primary dimensions of service quality on several constructs including satisfaction, price, image, and favourable future behavioural intentions. The results of this study identify service quality as having the most influential effect on satisfaction in higher education, and the results also suggest that service quality has an influence on the perceptions of the price (tuition fees) being paid. The positive relationship that was identified between Service Quality and Price may be interpreted as the higher the service quality, as perceived by students, the more willing students are to pay a higher price (fees) for their education. It is also plausible that in the case of higher education case, where most university students are between the ages of 18 and 24 (Ministry of Education, 2006), that students may not pay for their tuition fees or they may only pay a portion of their tuition fees. The contribution students receive from others for their tuition fees may result in students being less sensitive to the level of their tuition fees and

more sensitive to the quality of the university's service, in particular, Outcome Quality.

The results of this study also indicate that the perceptions of Price do not have a significant effect on Satisfaction. This result may be attributed to the direct measurement of Price on Satisfaction that was used in this study. Measuring the indirect effect of Price on Satisfaction, using a value construct in a similar modeling framework to that of Cronin et al. (2000) may provide different results.

The impact of Image on Service Quality and Satisfaction was significant in the research model. However, Image was much less important than Service Quality as a predictor of Satisfaction. The image of a university is important to students. However, students obtain a perception of their university's image from the outside community and from their personal experiences within the university. Therefore, as students obtain more inside knowledge about their university it is plausible that their perceptions of the university's image changes with their experiences. These perceptual changes may not always be highly favourable and if this is the case they may not increase the students' perceptions of their university's image.

The constructs in this study were also evaluated based on the perceptions of the demographic groups. The ethnic group had the most perceptual differences of several of the constructs. In particular, Asian students were less satisfied than Western students with their overall university experiences (see Section 5.5.6). This may be attributed to the fact that their education is obtained in a western style environment. It may be difficult for many Asian students to adapt to a western culture and this added challenge may make them less satisfied with their overall university experience.

Further, the Year of Study Groups also had perceptual differences of several constructs, in particular, the sub-dimensions pertaining to Interaction and Outcome Quality. The results

show that students studying in Year 3 are more satisfied with many of the pertaining sub-dimensions than those students studying in Year 2. The lecturers are often different and the subject content changes at the two different levels. Many of the Year 2 subjects are prerequisites for the Year 3 subjects and through this process students may be able to obtain a higher understanding and appreciation of their 300 level subjects. Class sizes are also smaller in Year 3 and students may have a more empathic relationship with their lecturers and peers in Year 3 as for many students this is their final year.

6.8.2 Managerial Implications

A general managerial implication highlighted in this research is that in order to achieve sustainability in today's competitive educational environment, university management is encouraged to apply a market-oriented approach such as those used in profit-oriented service organisations.

In relation to Research Objective 1, the results of this study identified three primary dimensions of academic service quality and ten sub-dimensions pertaining to the primary dimensions. University management can use the hierarchical model developed in this research for higher education in this strategic planning as the model provides a framework for evaluating students' perceptions of service quality. However, as the dimensions of service quality vary across industries and cultures, university managers should note that the primary and sub-dimensional structures must be carefully developed for their own specific institution and cultural setting to accurately measure students' perceptions of their university experiences.

In relation to Research Objective 2 and 3, the results provide university management with an improved understanding of the effect that service quality, price, and image have on satisfaction and favourable future behavioural intentions. The results of this research suggest

that improving students' perceptions of service quality should enhance students' level of satisfaction. Further, a higher level of satisfaction should ultimately enhance students' intention to attend the same university in the future and increase positive word of mouth about the university's academic programme. In the case of the university used in this study, although the university's image did not have as strong impact on satisfaction as expected, a positive image did help to improve students' perceptions of academic service quality and improve their level of satisfaction. University management should be concerned with their institution's image and should develop and use marketing strategies that positively enhance the perception of image in the minds of students and stakeholders.

In relation to Research Objective 4, the results of this study indicate that Interaction Quality is the most important dimension in a higher education context, followed by Outcome Quality and then Physical Environment Quality. When designing a measurement instrument to evaluate students' perceptions of service quality, management should recognise that the order of importance of the primary dimensions may vary between institutions. University management should concentrate on the sub-dimensions under Interaction Quality and improve the university's performance on the sub-dimensions. Resources could be allocated to the sub-dimensions based on the empirical findings. However, the sub-dimensions pertaining to Outcome Quality and Physical Environment Quality should also be resourced, as overall students' perceptions of academic service quality experiences do not rely solely on staff and student relationships.

In relation to Research Objective 5, the results (as discussed in Section 5.5.6) indicate that there are cultural differences between Western and Asian students. University management should be aware of the presence of perceptual differences between Western and Asian students. University management should consider whether to adjust their service strategy to cater more for Asian students, or to retain the current strategy that offers primarily a Western style of

education and encourage Asian students to adjust to the Western educational environment. For example, university management may consider offering specialised subjects in Asian business practices or subjects that specifically focus on marketing to Asian cultures.

6.9 Limitations

While this study provides a number of important contributions to the marketing theory and for higher education management, there are also some key limitations.

Firstly, this research focused solely on academic student satisfaction. There are also many social aspects that contribute to student satisfaction and service quality in an educational environment that this study did not measure.

Secondly, Lincoln University is considered a small higher education institution based on total student members (approximately 3600 students), and this may limit the generalisability of results for those higher education institutions that have large enrollments.

Thirdly, this study measured the perceptual differences between Western and Asian students based on demographic characteristics, however, perceptual differences between Western and Asian students based on psychographic characteristics were not identified in this study.

Fourthly, this study focused on the perceptions of students and did not measure the perceptions of staff and other stakeholders regarding student satisfaction and the pertaining constructs.

Lastly, the standardised coefficients are comparable against those in the same multiple regression models, but not against other regression models. Comparisons can not be made with the independent variables from multiple regression models based on the data collected at other universities.

6.10 Avenues for Future Research

A number of avenues for future research have emerged as a result of this study:

- Future researches could include the social aspects of education that no doubt have an impact on overall student satisfaction.
- Future researchers conducting studies at other higher education institutions need to develop their own hierarchical model. In addition, future researchers may wish to split the Academic Staff sub-dimension into two sub-dimensions as it is likely that this sub-dimension will be present in most higher education studies focusing on service quality and satisfaction.
- Future researches may decide to concentrate more fully on psychographic differences between Western and Asian students and the impact of these differences on perceptions of satisfaction, service quality, image, price, and favourable future behavioural intentions.
- Future researches may extend the current study and to measure the perceptions of staff and other stakeholders regarding students satisfaction and the pertaining constructs used in the hierarchical model.
- Future researches could analyse the changes in the importance of dimensions as the performance on the dimension changes. For example, a longitudinal study on students from entrance to graduation may provide more information on their level of satisfaction and the importance of the pertaining constructs at different stages of students' educational experiences.

- Future researchers may measure post graduate students' perceptions of the constructs as their perceptions may differ from those of undergraduate students.
- Future researchers could incorporate additional statistical techniques such as structural equation modeling to confirm the path of the model developed for this study.

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Appendices

Appendix 1: Cover Letter



Commerce Division
PO Box 84, Lincoln University,
Canterbury 8150, New Zealand
Telephone 64 3 325-2811
Facsimile 64 3 325-3847
www.lincoln.ac.nz

10/07/2006

Dear students,

I am a Master's Degree student at Lincoln University in Christchurch. My research project involves asking people about their perceptions of their university experience in New Zealand. You are invited to participate in this survey.

I ask your help with my project. Attached is a brief questionnaire, which should only take about 10 to 15 minutes, and your answers will be **completely anonymous and confidential**. This research is completely voluntary in nature. However, in order to qualify for this research, you must be a 200 level or 300 level student studying a commerce degree and at least 18 years old. This research is for my postgraduate research only; and it does not relate to Teaching and Learning Service's Subject or Lecturer evaluations. This research has been reviewed and approved by the Lincoln University Human Ethics Committee.

Please return the completed questionnaire in the enclosed postage-paid envelope. I will be pleased to discuss any concerns you have about your participation in the research. I can be contacted by telephoning (03) 3513568, or by emailing kaot@lincoln.ac.nz. You can also contact my supervisors Mr. Michael D. Clemes and/or Mr. Christopher Gan. Mr. Michael D. Clemes can be contacted at (03) 3252811 (ext 8364) or clemes@lincoln.ac.nz and Mr. Christopher Gan can be contacted at (03) 3282811 (ext 8155) or ganc1@lincoln.ac.nz.

Again, your assistance will contribute greatly to the success of my research. Each and every response is important and I appreciate your willingness to help. Thank you very much.

Yours sincerely,

Betty Kao
Master of Commerce and Management Student

Appendix 2: Questionnaire

A SURVEY OF UNIVERSITY STUDENTS' ACADEMIC EXPERIENCES IN HIGHER EDUCATION

QUESTIONNAIRE FOR POSTGRADUATE RESEARCH

This questionnaire is for postgraduate research only and it does not relate to Teaching and Learning Services's Subject or Lecturer Evaluations.

This questionnaire contains section A to E. Please answer all the questions in each section. Below is a series of statements that pertain to your overall university experiences at Lincoln University. On a scale of 1 (strongly agree) to 7 (strongly disagree), please indicate your responses.

Section A								
	Strongly Agree			Strongly Disagree			Not Applicable	
1 Lecturers and support staff (e.g. tutors) are polite and courteous	1	2	3	4	5	6	7	N/A
2 I have the opportunity to participate in class discussions	1	2	3	4	5	6	7	N/A
3 I feel comfortable approaching and talking to lecturers	1	2	3	4	5	6	7	N/A
4 Lecturers have extensive knowledge of their subjects	1	2	3	4	5	6	7	N/A
5 Lecturers have good teaching ability	1	2	3	4	5	6	7	N/A
6 Classes are well prepared and organised	1	2	3	4	5	6	7	N/A
7 Lecturers and support staff are concerned about student welfare and interests	1	2	3	4	5	6	7	N/A
8 Lecturers and support staff are willing to help with students' concerns	1	2	3	4	5	6	7	N/A
9 Marked assignments are returned from lecturers and/or support staff at a promised time	1	2	3	4	5	6	7	N/A
10 Lecturers provide convenient office hours	1	2	3	4	5	6	7	N/A
11 I can contact lecturers with minimum difficulty	1	2	3	4	5	6	7	N/A
12 Administration staff are courteous	1	2	3	4	5	6	7	N/A
13 Administration staff are sympathetic and reassuring when helping students	1	2	3	4	5	6	7	N/A
14 Administration staff solve my problems at a promised time	1	2	3	4	5	6	7	N/A
15 Overall, the quality of the interactions with all employees involved in Lincoln University is excellent	1	2	3	4	5	6	7	N/A

Appendix 2: Questionnaire (Continued)

Section B								
	Strongly Agree			Strongly Disagree			Not Applicable	
1 The course materials (e.g. handouts, textbooks) are useful	1	2	3	4	5	6	7	N/A
2 The course materials are relevant to the subjects	1	2	3	4	5	6	7	N/A
3 The course materials conform to students' interests	1	2	3	4	5	6	7	N/A
4 The library has an extensive collection available (e.g. books, periodicals)	1	2	3	4	5	6	7	N/A
5 The library is a quiet place to study	1	2	3	4	5	6	7	N/A
6 Library staff provide relevant information when required	1	2	3	4	5	6	7	N/A
7 Library staff solve my problems at a promised time	1	2	3	4	5	6	7	N/A
8 I am usually able to access a computer	1	2	3	4	5	6	7	N/A
9 Computer labs have quality equipment (e.g. hardware, software)	1	2	3	4	5	6	7	N/A
10 Lecture rooms are comfortable (e.g. lights, seats, heatings)	1	2	3	4	5	6	7	N/A
11 Lecture rooms have quality equipment (e.g. overhead projector, boards, audio-visual facilities)	1	2	3	4	5	6	7	N/A
12 The university has an excellent physical layout	1	2	3	4	5	6	7	N/A
13 The campus has excellent facilities (e.g. parking, accomodation, café)	1	2	3	4	5	6	7	N/A
14 The attitude of students sitting nearby affects my concentration during lectures	1	2	3	4	5	6	7	N/A
15 Disturbances during the lecture affects my concentration on lectures (e.g. construction noises, mobile phones ring)	1	2	3	4	5	6	7	N/A
16 Overall, the quality of the physical environment in Lincoln University is excellent	1	2	3	4	5	6	7	N/A

Section C								
	Strongly Agree			Strongly Disagree			Not Applicable	
1 I have acquired a broad general education in different fields	1	2	3	4	5	6	7	N/A
2 I developed my analytical and logical thinking	1	2	3	4	5	6	7	N/A
3 I developed my writing and speaking skills (e.g. through essay writings, presentations)	1	2	3	4	5	6	7	N/A
4 I have the ability to analyse quantitative problems	1	2	3	4	5	6	7	N/A
5 I have developed a personal code of values and ethics	1	2	3	4	5	6	7	N/A
6 I understand people of other racial and ethnic background better	1	2	3	4	5	6	7	N/A
7 I have improved my ability to learn effectively on my own, pursue ideas, and find the information I need	1	2	3	4	5	6	7	N/A
8 I have developed the ability to function as a member of a team	1	2	3	4	5	6	7	N/A
9 Lincoln University provides guidance and information on career opportunities	1	2	3	4	5	6	7	N/A
10 I have gained some knowledge and skills to enter a particular career	1	2	3	4	5	6	7	N/A
11 I have gained some transferable knowledge and skills to obtain my first job	1	2	3	4	5	6	7	N/A
12 I have acquired the ability to use general computing and information technology	1	2	3	4	5	6	7	N/A
13 I have acquired the ability to use specific computing and information technology techniques in my field of study	1	2	3	4	5	6	7	N/A
14 I have become more competent in my field of study	1	2	3	4	5	6	7	N/A
15 I have achieved my expected grades	1	2	3	4	5	6	7	N/A
16 I had an excellent learning experience at Lincoln University	1	2	3	4	5	6	7	N/A

Appendix 3: Data Imputation

Table 23A: Separate T-Tests Results

		a01	a02	a03	a04	a05	a06	a07	a08	a09	a10	a11	a12	a13	a14	a15
a14	t	-1.28	-0.46	-0.33	-0.45	-0.36	0.10	-0.95	-0.80	-0.48	0.84	1.11	-0.19	0.20	.	-0.13
	df	12.75	12.39	13.19	13.01	13.44	12.71	11.40	12.25	9.50	11.77	14.05	11.42	10.81	.	11.67
	P(2-tail)	0.22	0.65	0.75	0.66	0.72	0.92	0.36	0.44	0.64	0.42	0.29	0.85	0.84	.	0.90
	# Present	211	211	211	211	211	211	211	211	208	211	211	211	210	211	210
	# Missing	12	12	12	12	12	12	11	12	10	11	10	10	10	10	11
	Mean(Present)	2.38	2.66	2.57	2.21	2.73	2.53	3.03	2.62	2.65	2.82	2.60	2.75	2.86	3.00	2.87
	Mean(Missing)	2.75	2.83	2.67	2.33	2.83	2.50	3.36	2.92	2.90	2.55	2.40	2.80	2.80	.	2.91
b7	t	0.29	-0.77	-0.82	-0.70	0.27	-0.17	0.92	0.67	1.29	0.41	0.69	-0.64	-0.15	-0.01	-0.35
	df	13.79	11.91	12.68	12.57	13.75	12.23	11.23	12.44	12.54	10.88	11.17	13.74	11.42	7.59	12.05
	P(2-tail)	0.77	0.45	0.43	0.50	0.79	0.87	0.38	0.51	0.22	0.69	0.50	0.53	0.88	0.99	0.73
	# Present	211	211	211	211	211	211	211	211	206	211	210	209	209	203	209
	# Missing	12	12	12	12	12	12	11	12	12	11	11	12	11	8	12
	Mean(Present)	2.40	2.65	2.56	2.21	2.74	2.53	3.07	2.65	2.69	2.82	2.60	2.74	2.86	3.00	2.87
	Mean(Missing)	2.33	3.00	2.83	2.42	2.67	2.58	2.73	2.42	2.25	2.64	2.36	2.92	2.91	3.00	3.00
c11	t	0.00	-2.31	-0.94	-0.51	-0.36	-0.54	-1.16	-0.45	0.90	-1.72	-0.69	-0.39	-0.71	-0.01	-1.45
	df	15.25	15.23	14.87	15.10	15.52	15.07	15.54	15.39	14.53	14.90	14.02	16.46	15.39	15.05	14.00
	P(2-tail)	1.00	0.04	0.36	0.62	0.72	0.60	0.26	0.66	0.38	0.11	0.50	0.70	0.49	0.99	0.17
	# Present	208	208	208	208	208	208	207	208	204	207	207	206	206	197	207
	# Missing	15	15	15	15	15	15	15	15	14	15	14	15	14	14	14
	Mean(Present)	2.40	2.60	2.54	2.21	2.73	2.51	3.02	2.63	2.69	2.75	2.57	2.74	2.84	2.99	2.84
	Mean(Missing)	2.40	3.60	3.00	2.40	2.87	2.73	3.47	2.80	2.36	3.60	2.86	2.87	3.07	3.00	3.43
SPSQ	t	1.24	1.64	-0.63	-0.46	0.07	1.23	-1.74	-0.02	-0.08	-1.24	0.72	-0.36	-0.15	-0.47	0.61
	df	17.01	15.91	14.65	14.60	15.26	15.51	14.25	15.76	13.51	13.95	16.61	13.70	12.90	13.93	15.53
	P(2-tail)	0.23	0.12	0.54	0.65	0.94	0.24	0.10	0.98	0.94	0.23	0.48	0.72	0.89	0.65	0.55
	# Present	209	209	209	209	209	209	208	209	205	208	207	207	207	197	207
	# Missing	14	14	14	14	14	14	14	14	13	14	14	14	13	14	14
	Mean(Present)	2.42	2.70	2.56	2.21	2.74	2.55	3.00	2.64	2.66	2.77	2.60	2.74	2.86	2.98	2.88
	Mean(Missing)	2.14	2.21	2.79	2.36	2.71	2.21	3.71	2.64	2.69	3.36	2.43	2.93	2.92	3.21	2.71

		b01	b02	b03	b04	b05	b06	b07	b08	b09	b10	b11	b12	b13	b14	b15	b16
a14	t	1.68	2.74	0.38	1.13	2.72	0.61	-0.88	-0.60	1.58	-0.87	0.65	0.12	0.52	0.56	0.78	1.17
	df	14.54	14.46	13.08	12.32	14.64	15.94	8.56	12.17	13.02	12.64	11.99	12.49	14.15	12.02	12.51	13.18
	P(2-tail)	0.11	0.02	0.71	0.28	0.02	0.55	0.40	0.56	0.14	0.40	0.53	0.91	0.61	0.59	0.45	0.26
	# Present	211	211	211	210	210	208	203	209	210	210	211	211	210	207	210	211
	# Missing	12	12	11	11	12	12	8	12	12	12	12	12	12	12	12	12
	Mean(Present)	2.54	2.44	3.00	2.88	3.34	2.71	2.85	3.03	2.97	3.26	2.76	2.96	3.42	3.00	2.90	2.98
	Mean(Missing)	2.17	1.83	2.91	2.55	2.50	2.58	3.13	3.33	2.42	3.58	2.50	2.92	3.25	2.75	2.58	2.67
b7	t	0.62	0.53	-0.03	3.62	1.85	1.54	.	-0.69	0.26	-0.45	-0.20	-0.25	0.72	0.70	1.37	0.35
	df	12.50	12.53	12.02	13.40	11.53	10.27	.	11.19	12.24	11.75	11.80	11.55	12.25	10.65	12.38	11.90
	P(2-tail)	0.55	0.60	0.98	0.00	0.09	0.15	.	0.50	0.80	0.66	0.85	0.80	0.49	0.50	0.19	0.73
	# Present	211	211	210	210	211	211	211	210	210	210	211	211	210	208	210	211
	# Missing	12	12	12	11	11	9	0	11	12	12	12	12	12	11	12	12
	Mean(Present)	2.53	2.42	2.99	2.91	3.34	2.72	2.86	3.03	2.95	3.27	2.74	2.95	3.43	3.01	2.92	2.97
	Mean(Missing)	2.33	2.25	3.00	2.00	2.55	2.33	.	3.36	2.83	3.50	2.83	3.08	3.08	2.64	2.33	2.83
c11	t	-0.74	-0.98	-1.17	-0.77	-0.51	-0.11	0.10	-1.94	-1.52	-1.03	-0.70	-1.93	-1.56	-1.50	-0.38	-1.70
	df	16.04	16.53	15.98	14.63	14.02	11.88	10.79	14.50	15.31	15.18	15.41	15.35	14.31	12.56	14.05	15.87
	P(2-tail)	0.47	0.34	0.26	0.45	0.62	0.91	0.93	0.07	0.15	0.32	0.50	0.07	0.14	0.16	0.71	0.11
	# Present	208	208	207	207	208	208	200	207	207	207	208	208	208	206	208	208
	# Missing	15	15	15	14	14	12	11	14	15	15	15	15	14	13	14	15
	Mean(Present)	2.50	2.39	2.97	2.85	3.28	2.70	2.87	2.99	2.89	3.25	2.73	2.90	3.36	2.94	2.88	2.93
	Mean(Missing)	2.73	2.67	3.33	3.14	3.57	2.75	2.82	3.93	3.60	3.73	3.00	3.67	4.14	3.85	3.07	3.47
SPSQ	t	-1.26	-0.07	-0.59	0.59	-0.55	-0.36	-0.15	0.83	-0.11	-0.18	0.56	-0.12	-0.40	-1.13	0.45	-0.10
	df	15.30	14.75	14.03	14.53	14.21	13.07	13.31	15.08	13.83	14.24	14.81	14.36	14.91	14.50	14.79	14.02
	P(2-tail)	0.23	0.95	0.56	0.56	0.59	0.72	0.88	0.42	0.91	0.86	0.58	0.90	0.69	0.28	0.66	0.93
	# Present	209	209	208	207	208	207	198	207	208	208	209	209	209	208	205	208
	# Missing	14	14	14	14	14	13	13	14	14	14	14	14	14	14	14	14
	Mean(Present)	2.50	2.41	2.98	2.88	3.28	2.70	2.86	3.07	2.94	3.27	2.76	2.95	3.40	2.96	2.90	2.96
	Mean(Missing)	2.86	2.43	3.21	2.64	3.57	2.85	2.92	2.71	3.00	3.36	2.57	3.00	3.57	3.43	2.71	3.00

Table 23A: Separate T-Tests Results (Continued)

		c01	c02	c03	c04	c05	c06	c07	c08	c09	c10	c11	c12	c13	c14	c15	c16
a14	t	0.95	-0.11	-0.88	-0.19	-0.87	-1.22	1.55	-0.62	5.86	1.10	2.14	2.19	0.44	1.83	2.32	0.81
	df	12.54	18.18	13.69	14.11	11.94	10.59	15.68	8.33	14.85	13.49	13.13	14.76	13.59	14.77	15.08	15.33
	P(2-tail)	0.36	0.92	0.39	0.85	0.40	0.25	0.14	0.55	0.00	0.29	0.05	0.05	0.66	0.09	0.04	0.43
	# Present	208	211	210	210	208	209	211	210	209	208	197	206	206	208	207	209
	# Missing	11	12	12	12	12	11	12	9	11	12	11	11	11	12	12	12
	Mean(Present)	2.66	2.65	2.77	2.79	2.81	2.85	2.55	2.77	3.23	2.88	3.02	2.74	3.03	2.68	2.99	2.94
	Mean(Missing)	2.45	2.67	3.00	2.83	3.17	3.45	2.25	3.11	2.00	2.58	2.45	2.27	2.91	2.25	2.42	2.75
b7	t	-1.03	-0.37	-1.09	-0.96	-0.77	-2.05	-1.08	0.10	0.34	2.06	1.80	1.54	0.42	-0.44	-0.70	-0.43
	df	11.69	12.66	10.97	11.72	11.72	10.41	11.65	12.14	10.58	12.56	8.82	9.26	10.81	11.90	12.06	12.48
	P(2-tail)	0.32	0.72	0.30	0.36	0.46	0.07	0.30	0.92	0.74	0.06	0.11	0.16	0.68	0.67	0.50	0.67
	# Present	208	211	211	210	208	209	211	207	209	209	200	208	206	208	207	209
	# Missing	11	12	11	12	12	11	12	12	11	11	8	9	11	12	12	12
	Mean(Present)	2.64	2.64	2.76	2.77	2.81	2.82	2.51	2.79	3.18	2.89	3.01	2.74	3.03	2.64	2.94	2.92
	Mean(Missing)	2.91	2.75	3.18	3.17	3.17	4.00	3.00	2.75	3.00	2.36	2.50	2.22	2.82	2.83	3.25	3.08
c11	t	-0.90	-0.34	-0.47	-0.98	-0.39	-1.96	-1.50	-1.66	-1.29	0.74		-0.31	-0.96	-0.82	-0.78	-2.74
	df	15.64	16.73	15.82	14.74	12.75	14.89	15.20	16.00	12.80	11.99		11.59	11.83	12.90	14.19	16.69
	P(2-tail)	0.38	0.74	0.64	0.34	0.70	0.07	0.16	0.12	0.22	0.47		0.76	0.35	0.43	0.45	0.01
	# Present	205	208	207	207	207	205	208	204	207	208	208	206	205	207	205	206
	# Missing	14	15	15	15	13	15	15	15	13	12	0	11	12	13	14	15
	Mean(Present)	2.64	2.64	2.77	2.76	2.82	2.81	2.50	2.75	3.14	2.88	2.99	2.71	3.00	2.63	2.94	2.87
	Mean(Missing)	2.86	2.73	2.93	3.20	3.00	3.73	3.07	3.27	3.77	2.58		2.82	3.50	3.00	3.29	3.73
SPSQ	t	3.33	0.61	1.40	0.62	-0.09	-0.31	1.27	-0.31	-1.57	-0.89	-0.63	0.90	-0.69	-0.56	-1.14	-0.85
	df	15.80	15.45	14.31	15.50	14.76	14.09	15.47	16.33	14.25	14.09	11.56	14.43	13.35	13.44	14.24	14.11
	P(2-tail)	0.00	0.55	0.18	0.55	0.93	0.76	0.22	0.76	0.14	0.39	0.54	0.38	0.50	0.59	0.27	0.41
	# Present	205	209	208	208	206	206	209	205	206	206	196	204	204	207	205	207
	# Missing	14	14	14	14	14	14	14	14	14	14	12	13	13	13	14	14
	Mean(Present)	2.70	2.66	2.82	2.80	2.83	2.87	2.56	2.78	3.13	2.84	2.97	2.74	3.00	2.64	2.93	2.91
	Mean(Missing)	1.93	2.50	2.29	2.64	2.86	3.00	2.21	2.86	3.79	3.21	3.33	2.46	3.31	2.85	3.43	3.29

		XLSQ	SPSQ	STXP	OVST	FEEL	OVSQ	IMPS	IMGE	PROM	RPUT	FEES	VLUE	REDO	CTNU	RCMD
a14	t	2.72	0.20	2.03	3.23	-2.85	-2.41	5.19	2.02	2.29	2.38	0.98	1.22	-1.55	-1.82	-1.41
	df	16.09	11.89	12.64	12.49	13.57	13.11	12.73	12.31	12.87	12.46	12.16	13.32	12.66	12.14	12.61
	P(2-tail)	0.01	0.84	0.06	0.01	0.01	0.03	0.00	0.07	0.04	0.03	0.35	0.24	0.14	0.09	0.18
	# Present	210	197	210	211	210	211	211	207	207	208	210	210	209	211	211
	# Missing	12	12	12	11	12	12	10	12	12	12	12	12	12	12	12
	Mean(Present)	3.16	3.44	2.99	2.88	4.72	4.69	3.33	3.49	3.53	3.59	4.32	4.15	4.33	3.91	4.30
	Mean(Missing)	2.58	3.33	2.25	1.91	5.58	5.42	2.20	2.67	2.75	2.67	3.75	3.67	5.08	4.92	5.00
b7	t	0.38	0.13	0.24	0.74	-0.75	-0.71	1.33	0.05	0.53	0.61	0.86	0.07	0.20	-0.45	0.31
	df	12.44	10.67	11.81	10.67	12.07	12.12	10.83	11.80	11.91	11.82	11.85	12.05	11.92	11.74	12.03
	P(2-tail)	0.71	0.90	0.82	0.47	0.46	0.49	0.21	0.96	0.60	0.55	0.41	0.94	0.84	0.66	0.76
	# Present	210	198	210	211	210	211	210	207	207	208	210	210	209	211	211
	# Missing	12	11	12	11	12	12	11	12	12	12	12	12	12	12	12
	Mean(Present)	3.14	3.43	2.95	2.85	4.75	4.72	3.31	3.44	3.50	3.56	4.32	4.12	4.38	3.94	4.35
	Mean(Missing)	3.00	3.36	2.83	2.45	5.08	5.00	2.73	3.42	3.25	3.25	3.75	4.08	4.25	4.25	4.17
c11	t	-1.41	-0.99	-1.29	-0.86	0.37	-0.27	-1.25	-2.10	-2.14	-0.47	-1.28	-1.22	-0.05	-0.31	0.71
	df	15.33	13.29	15.38	15.32	17.87	17.39	16.22	14.67	14.22	14.20	16.25	15.87	15.45	15.20	15.21
	P(2-tail)	0.18	0.34	0.22	0.41	0.72	0.79	0.23	0.05	0.05	0.65	0.22	0.24	0.96	0.76	0.49
	# Present	207	196	207	207	207	208	206	205	206	207	207	207	206	208	208
	# Missing	15	13	15	15	15	15	15	14	13	13	15	15	15	15	
	Mean(Present)	3.09	3.40	2.91	2.81	4.77	4.73	3.25	3.39	3.45	3.53	4.25	4.08	4.37	3.95	4.37
	Mean(Missing)	3.67	3.85	3.47	3.20	4.67	4.80	3.67	4.21	4.15	3.69	4.87	4.67	4.40	4.13	3.93
SPSQ	t	-0.38		0.22	0.82	-1.12	-0.58	-0.27	-1.13	-0.57	-0.76	-0.16	-0.58	-0.10	0.36	-0.03
	df	17.89		12.98	15.49	15.09	14.61	15.57	12.08	13.66	14.61	15.39	15.24	12.68	14.60	14.83
	P(2-tail)	0.71		0.83	0.43	0.28	0.57	0.79	0.28	0.57	0.46	0.87	0.57	0.92	0.73	0.97
	# Present	208	209	209	208	208	209	207	207	206	207	208	208	209	209	209
	# Missing	14	0	13	14	14	14	14	12	13	13	14	14	12	14	14
	Mean(Present)	3.13	3.43	2.95	2.85	4.74	4.72	3.28	3.42	3.48	3.53	4.28	4.11	4.37	3.97	4.34
	Mean(Missing)	3.21		2.85	2.57	5.14	4.93	3.36	3.92	3.69	3.77	4.36	4.36	4.42	3.79	4.36

Appendix 3: Data Imputation

Table 24A: Estimated Means Results

Summary of Estimated Means																	
Interaction		a01	a02	a03	a04	a05	a06	a07	a08	a09	a10	a11	a12	a13	a14	a15	
Quality	All Values	2.40	2.67	2.57	2.22	2.74	2.53	3.05	2.64	2.67	2.81	2.59	2.75	2.86	3.00	2.87	
	EM	2.40	2.67	2.57	2.22	2.74	2.53	3.05	2.64	2.65	2.81	2.60	2.75	2.86	2.99	2.87	
Physical		b01	b02	b03	b04	b05	b06	b07	b08	b09	b10	b11	b12	b13	b14	b15	b16
Environment	All Values	2.52	2.41	2.99	2.86	3.30	2.70	2.86	3.05	2.94	3.28	2.75	2.96	3.41	2.99	2.89	2.96
	EM	2.52	2.41	2.99	2.86	3.29	2.71	2.86	3.04	2.94	3.28	2.75	2.96	3.41	2.99	2.89	2.96
Outcome		c01	c02	c03	c04	c05	c06	c07	c08	c09	c10	c11	c12	c13	c14	c15	c16
Quality	All Values	2.65	2.65	2.78	2.79	2.83	2.88	2.54	2.79	3.17	2.87	2.99	2.72	3.02	2.65	2.96	2.93
	EM	2.67	2.65	2.78	2.79	2.84	2.87	2.54	2.80	3.17	2.89	3.02	2.75	3.03	2.67	2.97	2.93
Sat, SQ,		XLSQ	SPSQ	STXP	OVST	FEEL	OVSQ	IMPS	IMGE	PROM	RPUT	FEES	VLUE	REDO	CTNU	RCMD	
FTAT, RCMD	All Values	3.13	3.43	2.95	2.83	4.77	4.73	3.28	3.44	3.49	3.54	4.29	4.12	4.37	3.96	4.34	
	EM	3.14	3.40	2.95	2.83	4.77	4.73	3.27	3.45	3.50	3.54	4.31	4.14	4.38	3.96	4.34	

Summary of Estimated Means					
	FEEL recode	OVSQ recode	REDO recode	CNTU recode	RCMD recode
All Values	3.23	3.27	3.63	4.04	3.66
EM	3.23	3.27	3.62	4.04	3.66

Appendix 4: Correlation Matrix

Table 25A : Correlation Matrix

	a01	a02	a03	a04	a05	a06	a07	a08	a09	a10	a11	a12	a13	a14	b01	b02	b03	b04	b05	b06	b07	b08
a01	1.000	0.503	0.497	0.543	0.595	0.565	0.538	0.608	0.432	0.288	0.447	0.499	0.516	0.432	0.438	0.501	0.417	0.167	0.175	0.391	0.404	0.287
a02	0.503	1.000	0.559	0.425	0.371	0.443	0.435	0.492	0.297	0.251	0.534	0.440	0.433	0.328	0.353	0.400	0.391	0.213	0.171	0.319	0.315	0.269
a03	0.497	0.559	1.000	0.537	0.481	0.441	0.476	0.521	0.292	0.278	0.457	0.370	0.404	0.333	0.387	0.390	0.360	0.170	0.142	0.315	0.335	0.298
a04	0.543	0.425	0.537	1.000	0.654	0.639	0.527	0.572	0.390	0.361	0.443	0.444	0.404	0.321	0.476	0.481	0.421	0.207	0.242	0.410	0.370	0.300
a05	0.595	0.371	0.481	0.654	1.000	0.681	0.617	0.564	0.424	0.409	0.445	0.425	0.451	0.397	0.434	0.466	0.458	0.178	0.205	0.363	0.345	0.272
a06	0.565	0.443	0.441	0.639	0.681	1.000	0.591	0.626	0.512	0.433	0.505	0.398	0.452	0.445	0.518	0.564	0.520	0.246	0.277	0.357	0.382	0.358
a07	0.538	0.435	0.476	0.527	0.617	0.591	1.000	0.719	0.445	0.520	0.484	0.518	0.469	0.499	0.434	0.453	0.566	0.332	0.347	0.425	0.432	0.347
a08	0.608	0.492	0.521	0.572	0.564	0.626	0.719	1.000	0.491	0.376	0.522	0.531	0.520	0.456	0.432	0.450	0.496	0.252	0.277	0.399	0.449	0.348
a09	0.432	0.297	0.292	0.390	0.424	0.512	0.445	0.491	1.000	0.394	0.465	0.459	0.395	0.452	0.441	0.414	0.401	0.213	0.220	0.345	0.301	0.293
a10	0.288	0.251	0.278	0.361	0.409	0.433	0.520	0.376	0.394	1.000	0.571	0.363	0.343	0.381	0.394	0.379	0.361	0.144	0.201	0.365	0.376	0.293
a11	0.447	0.534	0.457	0.443	0.445	0.505	0.484	0.522	0.465	0.571	1.000	0.521	0.477	0.427	0.383	0.494	0.374	0.184	0.254	0.428	0.407	0.329
a12	0.499	0.440	0.370	0.444	0.425	0.398	0.518	0.531	0.459	0.363	0.521	1.000	0.798	0.764	0.318	0.339	0.357	0.286	0.324	0.417	0.412	0.314
a13	0.516	0.433	0.404	0.404	0.451	0.452	0.469	0.520	0.395	0.343	0.477	0.798	1.000	0.765	0.355	0.346	0.336	0.246	0.259	0.415	0.437	0.299
a14	0.432	0.328	0.333	0.321	0.397	0.445	0.499	0.456	0.452	0.381	0.427	0.764	0.765	1.000	0.326	0.310	0.378	0.250	0.306	0.358	0.391	0.335
b01	0.438	0.353	0.387	0.476	0.434	0.518	0.434	0.432	0.441	0.394	0.383	0.318	0.355	0.326	1.000	0.753	0.699	0.307	0.295	0.349	0.367	0.318
b02	0.501	0.400	0.390	0.481	0.466	0.564	0.453	0.450	0.414	0.379	0.494	0.339	0.346	0.310	0.753	1.000	0.638	0.300	0.330	0.399	0.401	0.343
b03	0.417	0.391	0.360	0.421	0.458	0.520	0.566	0.496	0.401	0.361	0.374	0.357	0.336	0.378	0.699	0.638	1.000	0.417	0.298	0.324	0.328	0.324
b04	0.167	0.213	0.170	0.207	0.178	0.246	0.332	0.252	0.213	0.144	0.184	0.286	0.246	0.250	0.307	0.300	0.417	1.000	0.506	0.401	0.347	0.357
b05	0.175	0.171	0.142	0.242	0.205	0.277	0.347	0.277	0.220	0.201	0.254	0.324	0.259	0.306	0.295	0.330	0.298	0.506	1.000	0.652	0.554	0.335
b06	0.391	0.319	0.315	0.410	0.363	0.357	0.425	0.399	0.345	0.365	0.428	0.417	0.415	0.358	0.349	0.399	0.324	0.401	0.652	1.000	0.823	0.446
b07	0.404	0.315	0.335	0.370	0.345	0.382	0.432	0.449	0.301	0.376	0.407	0.412	0.437	0.391	0.367	0.401	0.328	0.347	0.554	0.823	1.000	0.410
b08	0.287	0.269	0.298	0.300	0.272	0.358	0.347	0.348	0.293	0.293	0.329	0.314	0.299	0.335	0.318	0.343	0.324	0.357	0.335	0.446	0.410	1.000
b09	0.249	0.207	0.320	0.380	0.283	0.339	0.386	0.342	0.300	0.360	0.286	0.321	0.282	0.302	0.308	0.287	0.324	0.338	0.401	0.471	0.369	0.565
b10	0.244	0.246	0.232	0.356	0.369	0.417	0.359	0.350	0.309	0.413	0.315	0.337	0.407	0.392	0.402	0.353	0.407	0.349	0.359	0.433	0.395	0.483
b11	0.173	0.247	0.222	0.314	0.309	0.396	0.335	0.326	0.324	0.260	0.295	0.306	0.307	0.278	0.384	0.343	0.423	0.410	0.343	0.386	0.347	0.345
b12	0.254	0.330	0.218	0.293	0.213	0.252	0.361	0.294	0.209	0.208	0.241	0.336	0.300	0.272	0.290	0.285	0.389	0.420	0.438	0.421	0.348	0.223
b13	0.156	0.197	0.273	0.192	0.224	0.221	0.369	0.274	0.308	0.280	0.206	0.297	0.247	0.319	0.341	0.259	0.452	0.429	0.352	0.348	0.275	0.333
b14	0.038	0.142	0.053	0.041	0.135	0.093	0.212	0.090	0.048	0.205	0.140	0.077	0.080	0.043	0.156	0.098	0.145	0.132	0.093	0.071	0.061	0.051
b15	0.112	0.179	0.155	0.071	0.139	0.140	0.258	0.171	0.239	0.123	0.139	0.140	0.135	0.142	0.241	0.200	0.250	0.229	0.122	0.137	0.108	0.129
c01	0.391	0.377	0.297	0.303	0.317	0.344	0.308	0.278	0.251	0.196	0.246	0.327	0.343	0.264	0.326	0.347	0.423	0.326	0.302	0.350	0.291	0.229
c02	0.441	0.412	0.464	0.454	0.459	0.414	0.478	0.460	0.356	0.331	0.448	0.467	0.436	0.334	0.425	0.400	0.441	0.307	0.341	0.436	0.504	0.251
c03	0.423	0.375	0.423	0.358	0.341	0.345	0.420	0.364	0.301	0.183	0.339	0.345	0.280	0.274	0.374	0.351	0.457	0.350	0.224	0.357	0.346	0.310
c04	0.314	0.318	0.437	0.392	0.404	0.374	0.388	0.402	0.258	0.343	0.363	0.315	0.352	0.212	0.402	0.363	0.340	0.154	0.194	0.387	0.355	0.294
c05	0.336	0.265	0.339	0.322	0.367	0.343	0.459	0.365	0.339	0.317	0.358	0.351	0.249	0.252	0.329	0.326	0.409	0.289	0.265	0.387	0.373	0.268
c06	0.290	0.334	0.329	0.298	0.355	0.292	0.347	0.301	0.344	0.301	0.286	0.279	0.261	0.263	0.241	0.255	0.399	0.215	0.141	0.230	0.196	0.341
c07	0.351	0.421	0.427	0.324	0.359	0.366	0.359	0.363	0.290	0.339	0.436	0.282	0.291	0.167	0.383	0.447	0.335	0.188	0.228	0.352	0.381	0.268
c08	0.354	0.344	0.417	0.317	0.329	0.313	0.474	0.388	0.335	0.406	0.401	0.406	0.298	0.340	0.343	0.312	0.407	0.241	0.200	0.329	0.350	0.288
c09	0.217	0.261	0.324	0.354	0.266	0.296	0.418	0.341	0.248	0.319	0.307	0.333	0.295	0.328	0.257	0.259	0.359	0.350	0.299	0.353	0.319	0.239
c10	0.212	0.269	0.295	0.279	0.172	0.263	0.369	0.281	0.203	0.257	0.294	0.331	0.245	0.277	0.217	0.227	0.341	0.403	0.280	0.340	0.310	0.241
c11	0.239	0.351	0.317	0.334	0.255	0.279	0.408	0.332	0.154	0.340	0.355	0.413	0.317	0.328	0.223	0.242	0.358	0.309	0.289	0.410	0.376	0.306
c12	0.310	0.283	0.283	0.365	0.330	0.351	0.379	0.386	0.239	0.389	0.427	0.343	0.305	0.232	0.315	0.365	0.322	0.263	0.245	0.442	0.377	0.309
c13	0.264	0.219	0.320	0.409	0.395	0.374	0.437	0.410	0.223	0.364	0.418	0.297	0.274	0.226	0.290	0.335	0.288	0.265	0.292	0.432	0.380	0.388
c14	0.273	0.324	0.383	0.400	0.362	0.414	0.476	0.447	0.309	0.383	0.398	0.403	0.349	0.380	0.377	0.389	0.384	0.321	0.276	0.371	0.352	0.300
c15	0.269	0.329	0.287	0.238	0.310	0.278	0.414	0.333	0.318	0.233	0.298	0.337	0.287	0.288	0.313	0.318	0.387	0.220	0.172	0.239	0.247	0.198

Appendix 4: Correlation Matrix

Table 25A : Correlation Matrix (Continued)

	b09	b10	b11	b12	b13	b14	b15	c01	c02	c03	c04	c05	c06	c07	c08	c09	c10	c11	c12	c13	c14	c15
a01	0.249	0.244	0.173	0.254	0.156	0.038	0.112	0.391	0.441	0.423	0.314	0.336	0.290	0.351	0.354	0.217	0.212	0.239	0.310	0.264	0.273	0.269
a02	0.207	0.246	0.247	0.330	0.197	0.142	0.179	0.377	0.412	0.375	0.318	0.265	0.334	0.421	0.344	0.261	0.269	0.351	0.283	0.219	0.324	0.329
a03	0.320	0.232	0.222	0.218	0.273	0.053	0.155	0.297	0.464	0.423	0.437	0.339	0.329	0.427	0.417	0.324	0.295	0.317	0.283	0.320	0.383	0.287
a04	0.380	0.356	0.314	0.293	0.192	0.041	0.071	0.303	0.454	0.358	0.392	0.322	0.298	0.324	0.317	0.354	0.279	0.334	0.365	0.409	0.400	0.238
a05	0.283	0.369	0.309	0.213	0.224	0.135	0.139	0.317	0.459	0.341	0.404	0.367	0.355	0.359	0.329	0.266	0.172	0.255	0.330	0.395	0.362	0.310
a06	0.339	0.417	0.396	0.252	0.221	0.093	0.140	0.344	0.414	0.345	0.374	0.343	0.292	0.366	0.313	0.296	0.263	0.279	0.351	0.374	0.414	0.278
a07	0.386	0.359	0.335	0.361	0.369	0.212	0.258	0.308	0.478	0.420	0.388	0.459	0.347	0.359	0.474	0.418	0.369	0.408	0.379	0.437	0.476	0.414
a08	0.342	0.350	0.326	0.294	0.274	0.090	0.171	0.278	0.460	0.364	0.402	0.365	0.301	0.363	0.388	0.341	0.281	0.332	0.386	0.410	0.447	0.333
a09	0.300	0.309	0.324	0.209	0.308	0.048	0.239	0.251	0.356	0.301	0.258	0.339	0.344	0.290	0.335	0.248	0.203	0.154	0.239	0.223	0.309	0.318
a10	0.360	0.413	0.260	0.208	0.280	0.205	0.123	0.196	0.331	0.183	0.343	0.317	0.301	0.339	0.406	0.319	0.257	0.340	0.389	0.364	0.383	0.233
a11	0.286	0.315	0.295	0.241	0.206	0.140	0.139	0.246	0.448	0.339	0.363	0.358	0.286	0.436	0.401	0.307	0.294	0.355	0.427	0.418	0.398	0.298
a12	0.321	0.337	0.306	0.336	0.297	0.077	0.140	0.327	0.467	0.345	0.315	0.351	0.279	0.282	0.406	0.333	0.331	0.413	0.343	0.297	0.403	0.337
a13	0.282	0.407	0.307	0.300	0.247	0.080	0.135	0.343	0.436	0.280	0.352	0.249	0.261	0.291	0.298	0.295	0.245	0.317	0.305	0.274	0.349	0.287
a14	0.302	0.392	0.278	0.272	0.319	0.043	0.142	0.264	0.334	0.274	0.212	0.252	0.263	0.167	0.340	0.328	0.277	0.328	0.232	0.226	0.380	0.288
b01	0.308	0.402	0.384	0.290	0.341	0.156	0.241	0.326	0.425	0.374	0.402	0.329	0.241	0.383	0.343	0.257	0.217	0.223	0.315	0.290	0.377	0.313
b02	0.287	0.353	0.343	0.285	0.259	0.098	0.200	0.347	0.400	0.351	0.363	0.326	0.255	0.447	0.312	0.259	0.227	0.242	0.365	0.335	0.389	0.318
b03	0.324	0.407	0.423	0.389	0.452	0.145	0.250	0.423	0.441	0.457	0.340	0.409	0.399	0.335	0.407	0.359	0.341	0.358	0.322	0.288	0.384	0.387
b04	0.338	0.349	0.410	0.420	0.429	0.132	0.229	0.326	0.307	0.350	0.154	0.289	0.215	0.188	0.241	0.350	0.403	0.309	0.263	0.265	0.321	0.220
b05	0.401	0.359	0.343	0.438	0.352	0.093	0.122	0.302	0.341	0.224	0.194	0.265	0.141	0.228	0.200	0.299	0.280	0.289	0.245	0.292	0.276	0.172
b06	0.471	0.433	0.386	0.421	0.348	0.071	0.137	0.350	0.436	0.357	0.387	0.387	0.230	0.352	0.329	0.353	0.340	0.410	0.442	0.432	0.371	0.239
b07	0.369	0.395	0.347	0.348	0.275	0.061	0.108	0.291	0.504	0.346	0.355	0.373	0.196	0.381	0.350	0.319	0.310	0.376	0.377	0.380	0.352	0.247
b08	0.565	0.483	0.345	0.223	0.333	0.051	0.129	0.229	0.251	0.310	0.294	0.268	0.341	0.268	0.288	0.239	0.241	0.306	0.309	0.388	0.300	0.198
b09	1.000	0.453	0.473	0.372	0.445	0.108	0.124	0.327	0.393	0.295	0.432	0.362	0.376	0.406	0.363	0.417	0.423	0.402	0.309	0.467	0.475	0.317
b10	0.453	1.000	0.597	0.487	0.491	0.066	0.150	0.300	0.286	0.275	0.322	0.251	0.319	0.280	0.272	0.250	0.241	0.350	0.332	0.351	0.392	0.239
b11	0.473	0.597	1.000	0.562	0.531	0.106	0.228	0.410	0.418	0.432	0.396	0.319	0.393	0.387	0.289	0.272	0.314	0.312	0.412	0.341	0.511	0.294
b12	0.372	0.487	0.562	1.000	0.633	0.197	0.252	0.541	0.436	0.323	0.335	0.368	0.396	0.373	0.345	0.389	0.388	0.292	0.349	0.334	0.381	0.314
b13	0.445	0.491	0.531	0.633	1.000	0.241	0.255	0.356	0.388	0.461	0.398	0.349	0.427	0.343	0.306	0.416	0.394	0.275	0.293	0.314	0.453	0.331
b14	0.108	0.066	0.106	0.197	0.241	1.000	0.641	0.200	0.184	0.134	0.173	0.093	0.099	0.144	0.111	0.217	0.235	0.149	0.134	0.102	0.179	0.185
b15	0.124	0.150	0.228	0.252	0.255	0.641	1.000	0.204	0.195	0.141	0.077	0.126	0.086	0.128	0.206	0.220	0.161	0.134	0.091	0.106	0.112	0.203
c01	0.327	0.300	0.410	0.541	0.356	0.200	0.204	1.000	0.583	0.472	0.508	0.464	0.444	0.403	0.428	0.349	0.350	0.284	0.366	0.284	0.395	0.342
c02	0.393	0.286	0.418	0.436	0.388	0.184	0.195	0.583	1.000	0.581	0.634	0.584	0.410	0.541	0.497	0.350	0.460	0.425	0.452	0.406	0.577	0.458
c03	0.295	0.275	0.432	0.323	0.461	0.134	0.141	0.472	0.581	1.000	0.602	0.589	0.415	0.498	0.453	0.287	0.404	0.475	0.449	0.367	0.608	0.461
c04	0.432	0.322	0.396	0.335	0.398	0.173	0.077	0.508	0.634	0.602	1.000	0.611	0.464	0.579	0.503	0.356	0.358	0.399	0.504	0.513	0.574	0.398
c05	0.362	0.251	0.319	0.368	0.349	0.093	0.126	0.464	0.584	0.589	0.611	1.000	0.537	0.473	0.586	0.344	0.347	0.334	0.422	0.488	0.493	0.341
c06	0.376	0.319	0.393	0.396	0.427	0.099	0.086	0.444	0.410	0.415	0.464	0.537	1.000	0.445	0.474	0.385	0.325	0.274	0.240	0.277	0.357	0.286
c07	0.406	0.280	0.387	0.373	0.343	0.144	0.128	0.403	0.541	0.498	0.579	0.473	0.445	1.000	0.501	0.320	0.307	0.375	0.548	0.483	0.548	0.472
c08	0.363	0.272	0.289	0.345	0.306	0.111	0.206	0.428	0.497	0.453	0.503	0.586	0.474	0.501	1.000	0.449	0.449	0.461	0.470	0.443	0.439	0.339
c09	0.417	0.250	0.272	0.389	0.416	0.217	0.220	0.349	0.350	0.287	0.356	0.344	0.385	0.320	0.449	1.000	0.646	0.485	0.392	0.481	0.438	0.361
c10	0.423	0.241	0.314	0.388	0.394	0.235	0.161	0.350	0.460	0.404	0.358	0.347	0.325	0.307	0.449	0.646	1.000	0.648	0.506	0.509	0.523	0.387
c11	0.402	0.350	0.312	0.292	0.275	0.149	0.134	0.284	0.425	0.475	0.399	0.334	0.274	0.375	0.461	0.485	0.648	1.000	0.510	0.448	0.582	0.451
c12	0.430	0.332	0.412	0.349	0.293	0.134	0.091	0.366	0.452	0.449	0.504	0.422	0.240	0.548	0.470	0.392	0.506	0.510	1.000	0.713	0.537	0.337
c13	0.467	0.351	0.341	0.334	0.314	0.102	0.106	0.284	0.406	0.367	0.513	0.488	0.277	0.483	0.443	0.481	0.509	0.448	0.713	1.000	0.583	0.361
c14	0.475	0.392	0.511	0.381	0.453	0.179	0.112	0.395	0.577	0.608	0.574	0.493	0.357	0.548	0.439	0.438	0.523	0.582	0.537	0.583	1.000	0.637
c15	0.317	0.239	0.294	0.314	0.331	0.185	0.203	0.342	0.458	0.461	0.398	0.341	0.286	0.472	0.339	0.361	0.387	0.451	0.337	0.361	0.637	1.000

Appendix 5: Anti-Image Correlation Matrix

Table 26A : Anti-Image Correlation Matrix

	a01	a02	a03	a04	a05	a06	a07	a08	a09	a10	a11	a12	a13	a14	b01	b02	b03	b04	b05	b06	b07	b08
a01	0.926	-0.074	-0.035	0.002	-0.223	-0.078	-0.040	-0.238	-0.029	0.018	0.041	-0.047	-0.094	-0.009	-0.082	-0.167	0.119	0.074	0.162	-0.096	-0.017	0.010
a02	-0.074	0.939	-0.284	0.001	0.109	-0.117	-0.046	-0.065	0.062	0.105	-0.257	-0.095	-0.012	0.065	-0.041	0.032	-0.030	-0.036	0.075	-0.062	0.034	-0.046
a03	-0.035	-0.284	0.936	-0.218	-0.112	0.076	-0.036	-0.095	0.120	0.047	-0.111	0.138	-0.084	-0.054	-0.051	0.001	0.073	0.026	0.043	0.025	-0.024	-0.034
a04	0.002	0.001	-0.218	0.919	-0.257	-0.239	0.006	-0.065	-0.030	-0.011	0.052	-0.233	0.086	0.176	-0.151	-0.031	0.041	0.031	0.084	-0.108	0.062	0.061
a05	-0.223	0.109	-0.112	-0.257	0.920	-0.285	-0.208	0.081	0.011	0.014	0.036	-0.019	0.015	-0.045	0.072	-0.010	-0.053	-0.035	0.040	-0.112	0.098	0.098
a06	-0.078	-0.117	0.076	-0.239	-0.285	0.937	-0.036	-0.132	-0.185	-0.052	-0.055	0.227	-0.047	-0.161	0.036	-0.090	-0.073	0.015	-0.104	0.158	-0.058	-0.093
a07	-0.040	-0.046	-0.036	0.006	-0.208	-0.036	0.945	-0.395	0.047	-0.307	0.120	0.005	0.000	-0.083	0.116	-0.024	-0.153	-0.025	-0.102	-0.015	0.053	-0.016
a08	-0.238	-0.065	-0.095	-0.065	0.081	-0.132	-0.395	0.928	-0.166	0.177	-0.107	-0.088	-0.052	0.130	0.053	0.110	-0.160	0.000	-0.050	0.145	-0.184	-0.027
a09	-0.029	0.062	0.120	-0.030	0.011	-0.185	0.047	-0.166	0.917	-0.092	-0.138	-0.115	0.079	-0.086	-0.151	0.024	0.099	0.016	0.037	-0.159	0.111	0.026
a10	0.018	0.105	-0.047	-0.011	-0.052	-0.307	0.177	-0.092	0.894	-0.380	0.008	0.056	-0.036	-0.122	0.041	0.011	0.019	0.019	0.113	0.015	-0.133	0.061
a11	0.041	-0.257	-0.111	0.052	0.036	-0.055	0.120	-0.107	-0.138	-0.380	0.923	-0.110	-0.020	-0.020	0.140	-0.214	-0.003	0.053	-0.011	-0.131	0.135	-0.048
a12	-0.047	-0.095	0.138	-0.233	-0.019	0.227	0.005	-0.088	-0.115	0.008	-0.110	0.912	-0.463	-0.339	0.078	-0.048	0.055	-0.018	-0.099	0.038	0.066	-0.058
a13	-0.094	-0.012	-0.084	0.086	0.015	-0.047	0.000	-0.052	0.079	0.056	-0.020	-0.463	0.904	-0.408	-0.076	0.059	0.037	-0.117	0.153	-0.085	-0.030	0.082
a14	-0.009	0.065	-0.054	0.176	-0.045	-0.161	-0.083	0.130	-0.086	-0.036	-0.020	-0.339	-0.408	0.899	-0.019	0.055	0.067	0.125	-0.111	0.110	-0.126	-0.062
b01	-0.082	-0.041	-0.051	-0.151	0.072	0.036	0.116	0.053	-0.151	-0.122	0.140	0.078	-0.076	-0.019	0.912	-0.435	-0.408	-0.015	-0.072	0.045	-0.010	-0.020
b02	-0.167	0.032	0.001	-0.031	-0.010	-0.090	-0.024	0.110	0.024	0.041	-0.214	-0.048	0.059	0.055	-0.435	0.925	-0.220	-0.021	-0.100	0.013	-0.061	-0.086
b03	0.119	-0.030	0.073	0.041	-0.053	-0.073	-0.153	-0.160	0.099	0.011	-0.003	0.055	0.037	-0.069	-0.408	-0.220	0.927	-0.099	0.075	0.016	0.034	0.057
b04	0.074	-0.036	0.026	0.031	-0.035	0.015	-0.025	0.000	0.016	0.019	0.053	-0.018	-0.117	0.125	-0.015	-0.021	-0.099	0.934	-0.253	0.002	0.001	-0.155
b05	0.162	0.075	0.043	0.084	0.040	-0.104	-0.102	-0.050	0.037	0.113	-0.011	-0.099	0.153	-0.111	-0.072	-0.100	0.075	-0.253	0.890	-0.372	0.008	0.044
b06	-0.096	-0.062	0.025	-0.108	-0.112	0.158	-0.015	0.145	-0.159	0.015	-0.131	0.038	-0.085	0.110	0.045	0.013	0.016	0.002	-0.372	0.877	-0.682	-0.042
b07	-0.017	0.034	-0.024	0.062	0.098	-0.058	0.053	-0.184	0.111	-0.133	0.135	0.066	-0.030	-0.126	-0.010	-0.061	0.034	0.001	0.008	-0.682	0.875	-0.098
b08	0.010	-0.046	-0.034	0.061	-0.098	-0.093	-0.016	-0.027	0.026	0.061	-0.048	-0.058	0.082	-0.062	-0.020	-0.086	0.057	-0.155	0.044	-0.042	-0.098	0.902
b09	-0.115	0.087	-0.073	-0.153	0.117	0.024	-0.027	0.029	-0.019	-0.065	0.092	0.010	0.047	-0.042	0.023	0.092	-0.020	0.007	-0.120	-0.122	0.141	-0.380
b10	0.028	-0.008	0.060	-0.060	-0.114	-0.026	0.109	-0.027	0.006	-0.188	0.028	0.142	-0.183	-0.035	-0.062	0.016	-0.004	-0.004	-0.035	0.026	-0.044	-0.218
b11	0.205	0.046	0.070	0.072	-0.083	-0.149	-0.012	0.018	-0.032	0.111	-0.100	-0.075	-0.011	0.112	-0.073	0.051	-0.032	-0.072	0.037	0.038	-0.106	0.070
b12	-0.124	-0.129	0.104	-0.190	0.180	0.049	-0.092	0.013	0.149	0.090	-0.007	-0.018	0.018	-0.003	0.040	0.006	0.034	-0.027	-0.124	-0.051	0.017	0.150
b13	0.082	0.090	-0.156	0.200	-0.045	0.083	0.003	-0.006	-0.127	-0.095	0.097	-0.084	0.115	-0.083	-0.008	0.059	-0.173	-0.070	0.008	-0.065	0.085	-0.040
b14	0.036	-0.056	0.178	0.017	-0.157	-0.002	-0.068	0.042	0.187	-0.135	-0.119	-0.022	-0.036	0.116	-0.095	0.120	0.051	0.051	-0.087	0.105	-0.078	-0.014
b15	0.030	0.002	-0.148	0.069	0.081	0.024	-0.034	-0.043	-0.217	0.091	0.101	0.051	0.004	-0.071	0.000	-0.122	0.011	-0.074	0.123	-0.108	0.115	-0.023
c01	-0.157	-0.099	0.014	0.071	0.015	-0.091	0.137	0.097	-0.001	-0.025	0.145	0.031	-0.066	-0.008	0.123	-0.056	-0.145	-0.049	-0.070	-0.080	0.140	-0.021
c02	-0.014	0.020	-0.029	-0.106	-0.161	0.104	-0.002	0.029	-0.024	0.021	-0.150	-0.053	-0.082	0.115	-0.055	0.115	-0.037	0.025	-0.135	0.232	-0.323	0.045
c03	-0.298	-0.011	-0.053	-0.133	0.100	0.048	-0.089	0.159	-0.021	0.231	-0.086	0.034	0.088	-0.041	0.018	0.114	-0.109	-0.127	-0.003	0.026	-0.044	-0.121
c04	0.192	0.039	-0.070	0.039	-0.025	-0.055	0.056	-0.157	0.084	-0.050	0.078	0.059	-0.194	0.122	-0.152	-0.068	0.176	0.189	0.104	-0.143	0.117	0.018
c05	0.033	0.091	0.017	0.125	0.024	-0.088	-0.113	0.070	-0.055	0.018	-0.026	-0.163	0.146	0.041	0.004	0.026	-0.074	-0.087	0.030	-0.056	-0.045	0.113
c06	-0.018	-0.120	0.025	-0.059	-0.143	0.148	0.081	-0.020	-0.145	-0.101	0.060	0.111	-0.053	-0.055	0.173	-0.012	-0.134	0.063	0.043	0.030	0.098	-0.217
c07	-0.018	-0.120	-0.094	0.133	-0.018	-0.074	0.058	0.066	-0.024	0.000	-0.055	0.029	-0.094	0.189	-0.010	-0.157	0.101	0.044	-0.065	0.127	-0.152	0.086
c08	-0.031	0.028	-0.108	0.065	0.012	0.077	-0.100	0.020	-0.032	-0.092	-0.027	-0.120	0.168	-0.085	-0.090	0.111	-0.035	0.006	0.039	0.081	-0.072	-0.019
c09	0.064	0.029	-0.013	-0.167	0.017	0.014	-0.018	-0.035	0.022	-0.017	-0.036	0.061	-0.046	-0.068	0.003	0.010	-0.006	-0.066	-0.036	0.020	-0.071	0.094
c10	-0.062	0.016	-0.090	0.072	0.192	-0.127	-0.020	0.093	-0.085	0.095	0.016	-0.016	0.049	-0.004	0.031	-0.034	-0.004	-0.162	0.073	0.006	-0.001	0.096
c11	0.053	-0.102	0.033	-0.033	-0.024	-0.029	-0.002	0.032	0.172	-0.091	0.011	-0.146	0.042	0.034	0.099	0.080	-0.161	0.044	-0.059	-0.083	-0.002	-0.033
c12	-0.009	0.008	0.092	0.016	0.019	0.024	0.080	-0.108	-0.001	-0.136	0.028	-0.030	-0.003	-0.012	0.030	-0.073	-0.014	-0.003	0.130	-0.157	0.124	0.031
c13	0.025	0.090	0.041	-0.077	-0.179	0.039	-0.059	-0.006	0.093	0.078	-0.160	0.063	-0.048	0.080	-0.004	0.058	0.031	0.037	-0.075	0.043	-0.046	-0.205
c14	0.143	0.023	-0.029	-0.057	0.105	-0.054	0.033	-0.191	0.055	-0.118	0.092	0.045	0.075	-0.231	-0.019	-0.155	0.201	-0.047	0.076	-0.061	0.134	0.112
c15	0.008	-0.063	0.055	0.139	-0.115	0.085	-0.116	0.077	-0.172	0.094	0.000	-0.054	0.002	0.048	-0.005	0.021	-0.132	0.051	0.048	0.055	-0.042	-0.005

Appendix 5: Anti-Image Correlation Matrix

Table 26A : Anti-Image Correlation Matrix (Continued)

	b09	b10	b11	b12	b13	b14	b15	c01	c02	c03	c04	c05	c06	c07	c08	c09	c10	c11	c12	c13	c14	c15
a01	-0.115	0.028	0.205	-0.124	0.082	0.036	0.030	-0.157	-0.014	-0.298	0.192	0.033	-0.018	-0.018	-0.031	0.064	-0.062	0.053	-0.009	0.025	0.143	0.008
a02	0.087	-0.008	0.046	-0.129	0.090	-0.056	0.002	-0.099	0.020	-0.011	0.039	0.091	-0.120	-0.120	0.028	0.029	0.016	-0.102	0.008	0.090	0.023	-0.063
a03	-0.073	0.060	0.070	0.104	-0.156	0.178	-0.148	0.014	-0.029	-0.053	-0.070	0.017	0.025	-0.094	-0.108	-0.013	-0.090	0.033	0.092	0.041	-0.029	0.055
a04	-0.153	-0.060	0.072	-0.190	0.200	0.017	0.069	0.071	-0.106	-0.133	0.039	0.125	-0.059	0.133	0.065	-0.167	0.072	-0.033	0.016	-0.077	-0.057	0.139
a05	0.117	-0.114	-0.083	0.180	-0.045	-0.157	0.081	0.015	-0.161	0.100	-0.025	0.024	-0.143	-0.018	0.012	0.017	0.192	-0.024	0.019	-0.179	0.105	-0.115
a06	0.024	-0.026	-0.149	0.049	0.083	-0.002	0.024	-0.091	0.104	0.048	-0.055	-0.088	0.148	-0.074	0.077	0.014	-0.127	0.029	0.024	0.039	-0.054	0.085
a07	-0.027	0.109	-0.012	-0.092	0.003	-0.068	-0.034	0.137	-0.002	-0.089	0.056	-0.113	0.081	0.058	-0.100	-0.018	-0.020	-0.002	0.080	-0.059	0.033	-0.116
a08	0.029	-0.027	0.018	0.013	-0.006	0.042	-0.043	0.097	0.029	0.159	-0.157	0.070	-0.020	0.066	0.020	-0.035	0.093	0.032	-0.108	-0.006	-0.191	0.077
a09	-0.019	0.006	-0.032	0.149	-0.127	0.187	-0.217	-0.001	-0.024	-0.021	0.084	-0.055	-0.145	-0.024	-0.032	0.022	-0.085	0.172	-0.001	0.093	0.055	-0.172
a10	-0.065	-0.188	0.111	0.090	-0.095	-0.135	0.091	-0.025	0.021	0.231	-0.050	0.018	-0.101	0.000	-0.092	-0.017	0.095	-0.091	-0.136	0.078	-0.118	0.094
a11	0.092	0.028	-0.100	-0.007	0.097	-0.119	0.101	0.145	-0.150	-0.086	0.078	-0.026	0.060	-0.055	-0.027	-0.036	0.016	0.011	0.028	-0.160	0.092	0.000
a12	0.010	0.142	-0.075	-0.018	-0.084	-0.022	0.051	0.031	-0.053	0.034	0.059	-0.163	0.111	0.029	-0.120	0.061	-0.016	-0.146	-0.030	0.063	0.045	-0.054
a13	0.047	-0.183	-0.011	0.018	0.115	-0.036	0.004	-0.066	-0.082	0.088	-0.194	0.146	-0.053	-0.094	0.168	-0.046	0.049	0.042	-0.003	-0.048	0.075	0.002
a14	-0.042	-0.035	0.112	-0.003	-0.083	0.116	-0.071	-0.008	0.115	-0.041	0.122	0.041	-0.055	0.189	-0.085	-0.068	-0.004	0.034	-0.012	0.080	-0.231	0.048
b01	0.023	-0.062	-0.073	0.040	-0.008	-0.095	0.000	0.123	-0.055	0.018	-0.152	0.004	0.173	-0.010	-0.090	0.003	0.031	0.099	0.030	-0.004	-0.019	-0.005
b02	0.092	0.016	0.051	0.006	0.059	0.120	-0.122	-0.056	0.115	0.114	-0.068	0.026	-0.012	-0.157	0.111	0.010	-0.034	0.080	-0.073	0.058	-0.155	0.021
b03	-0.020	-0.004	-0.032	0.034	-0.173	0.051	0.011	-0.145	-0.037	-0.109	0.176	-0.074	-0.134	0.101	-0.035	-0.006	-0.004	-0.161	-0.014	0.031	0.201	-0.132
b04	0.007	-0.004	-0.072	-0.027	-0.070	0.051	-0.074	-0.049	0.025	-0.127	0.189	-0.087	0.063	0.044	0.006	-0.066	-0.162	0.044	-0.003	0.037	-0.047	0.051
b05	-0.120	-0.035	0.037	-0.124	0.008	-0.087	0.123	-0.070	-0.135	-0.003	0.104	0.030	0.043	-0.065	0.039	-0.036	0.073	-0.059	0.130	-0.075	0.076	0.048
b06	-0.122	0.026	0.038	-0.051	-0.065	0.105	-0.108	-0.080	0.232	0.026	-0.143	-0.056	0.030	0.127	0.081	0.020	0.006	-0.083	-0.157	0.043	-0.061	0.055
b07	0.141	-0.044	-0.106	0.017	0.085	-0.078	0.115	0.140	-0.323	-0.044	0.117	-0.045	0.098	-0.152	-0.072	-0.071	-0.001	-0.002	0.124	-0.046	0.134	-0.042
b08	-0.380	-0.218	0.070	0.150	-0.040	-0.014	-0.023	-0.021	0.045	-0.121	0.018	0.113	-0.217	0.086	-0.019	0.094	0.096	-0.033	0.031	-0.205	0.112	-0.005
b09	0.925	-0.016	-0.197	0.097	-0.100	-0.015	0.029	-0.007	-0.040	0.254	-0.099	-0.065	0.004	-0.145	0.022	-0.050	-0.086	-0.026	-0.033	0.010	-0.057	-0.055
b10	-0.016	0.932	-0.266	-0.171	-0.164	0.069	-0.014	0.001	0.124	0.059	-0.011	-0.011	0.024	0.065	-0.025	0.111	0.054	-0.182	0.033	-0.035	-0.007	-0.008
b11	-0.197	-0.266	0.902	-0.235	-0.011	0.178	-0.207	-0.036	0.009	-0.151	-0.019	0.164	-0.180	0.019	0.058	0.069	0.006	0.089	-0.166	0.113	-0.244	0.136
b12	0.097	-0.171	-0.235	0.891	-0.436	-0.004	-0.042	-0.274	-0.032	0.228	0.071	-0.102	-0.058	-0.087	-0.039	0.015	-0.045	0.031	-0.023	-0.046	0.070	-0.096
b13	-0.100	-0.164	-0.011	-0.436	0.888	-0.099	0.018	0.173	-0.036	-0.272	-0.107	0.132	-0.066	-0.038	0.108	-0.154	-0.052	0.185	0.061	-0.006	-0.064	0.067
b14	-0.015	0.069	0.178	-0.004	-0.099	0.578	-0.679	-0.087	0.099	-0.005	-0.139	0.055	-0.056	-0.010	0.141	0.018	-0.198	0.085	-0.086	0.162	-0.154	0.040
b15	0.029	-0.014	-0.207	-0.042	0.018	-0.679	0.642	0.009	-0.133	-0.001	0.172	-0.041	0.142	0.009	-0.156	-0.089	0.160	-0.112	0.115	-0.141	0.207	-0.081
c01	-0.007	0.001	-0.036	-0.274	0.173	-0.087	0.009	0.925	-0.252	-0.078	-0.160	-0.005	-0.172	0.070	-0.106	-0.113	0.036	0.107	-0.068	0.059	-0.009	-0.032
c02	-0.040	0.124	0.009	-0.032	-0.036	0.099	-0.133	-0.252	0.930	-0.001	-0.219	-0.149	0.035	-0.060	0.025	0.164	-0.228	0.042	-0.032	0.157	-0.164	-0.027
c03	0.254	0.059	-0.151	0.228	-0.272	-0.005	-0.001	-0.078	-0.001	0.897	-0.241	-0.245	0.014	-0.070	0.023	0.122	-0.002	-0.168	-0.132	0.152	-0.217	-0.049
c04	-0.099	-0.011	-0.019	0.071	-0.107	-0.139	0.172	-0.160	-0.219	-0.241	0.923	-0.186	-0.058	-0.065	-0.100	-0.043	0.081	-0.057	0.016	-0.130	0.034	-0.018
c05	-0.065	-0.011	0.164	-0.102	0.132	0.055	-0.041	-0.005	-0.149	-0.245	0.186	0.924	-0.293	0.051	-0.188	0.013	0.100	0.104	0.040	-0.206	-0.068	0.088
c06	0.004	0.024	-0.180	-0.058	-0.066	-0.056	0.142	-0.072	0.035	0.014	-0.058	-0.293	0.902	-0.203	-0.105	-0.134	-0.092	0.007	0.185	0.070	0.066	0.038
c07	-0.145	0.065	0.019	-0.087	-0.038	-0.010	0.009	0.070	-0.060	-0.070	-0.065	0.051	-0.203	0.935	-0.164	-0.005	0.189	-0.021	-0.231	-0.047	-0.095	-0.158
c08	0.022	-0.025	0.058	-0.039	0.108	0.141	-0.156	-0.106	0.025	0.023	-0.100	-0.188	-0.105	-0.164	0.951	-0.087	-0.083	-0.090	-0.095	0.015	0.025	0.076
c09	-0.050	0.111	0.069	0.015	-0.154	0.018	-0.089	-0.113	0.164	0.122	-0.043	0.013	-0.134	-0.005	-0.087	0.938	-0.345	-0.066	0.045	-0.117	0.014	-0.079
c10	-0.086	0.054	0.006	-0.045	-0.052	-0.198	0.160	0.036	-0.228	-0.002	0.081	0.100	-0.092	0.189	-0.083	-0.345	0.893	-0.369	-0.114	-0.193	-0.011	-0.001
c11	-0.026	-0.182	0.089	0.031	0.185	0.085	-0.112	0.107	0.042	-0.168	-0.057	0.104	0.007	-0.021	-0.090	-0.066	-0.369	0.918	-0.116	0.115	-0.200	-0.082
c12	-0.033	0.033	-0.166	-0.023	0.061	-0.086	0.115	-0.068	-0.032	-0.132	0.016	0.040	0.185	-0.231	-0.095	0.045	-0.114	-0.116	0.920	-0.466	0.095	0.066
c13	0.010	-0.035	0.113	-0.046	-0.006	0.162	-0.141	0.059	0.157	0.152	-0.130	-0.206	0.070	-0.047	0.015	-0.117	-0.193	0.115	-0.466	0.900	-0.265	0.003
c14	-0.057	-0.007	-0.244	0.070	-0.064	-0.154	0.207	-0.009	-0.164	-0.217	0.034	-0.068	0.066	-0.095	0.025	0.014	-0.011	-0.200	0.095	-0.265	0.911	-0.396
c15	-0.055	-0.008	0.136	-0.096	0.067	0.040	-0.081	-0.032	-0.027	-0.049	-0.018	0.088	0.038	-0.158	0.076	-0.079	-0.001	-0.082	0.066	0.003	-0.396	0.923

Appendix 6: Factor Extraction Table

Table 27A: Eigenvalues and the Explained Percentage of variance by the Factors

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	16.349	37.157	37.157	16.349	37.157	37.157
2	2.908	6.608	43.766	2.908	6.608	43.766
3	2.175	4.943	48.709	2.175	4.943	48.709
4	1.837	4.174	52.883	1.837	4.174	52.883
5	1.646	3.740	56.623	1.646	3.740	56.623
6	1.462	3.323	59.945	1.462	3.323	59.945
7	1.300	2.954	62.899	1.300	2.954	62.899
8	1.138	2.587	65.487	1.138	2.587	65.487
9	1.062	2.413	67.900	1.062	2.413	67.900
10	1.003	2.280	70.180	1.003	2.280	70.180
11	0.924	2.100	72.280			
12	0.877	1.994	74.275			
13	0.762	1.733	76.007			
14	0.712	1.617	77.624			
15	0.701	1.592	79.217			
16	0.646	1.469	80.686			
17	0.612	1.391	82.076			
18	0.578	1.313	83.390			
19	0.527	1.199	84.588			
20	0.502	1.140	85.728			
21	0.454	1.031	86.759			
22	0.442	1.005	87.764			
23	0.433	0.985	88.749			
24	0.397	0.903	89.652			
25	0.368	0.836	90.488			
26	0.352	0.800	91.288			
27	0.349	0.794	92.082			
28	0.323	0.734	92.816			
29	0.311	0.706	93.522			
30	0.300	0.682	94.204			
31	0.279	0.635	94.839			
32	0.256	0.582	95.421			
33	0.245	0.557	95.977			
34	0.231	0.525	96.503			
35	0.213	0.485	96.988			
36	0.200	0.455	97.442			
37	0.196	0.445	97.887			
38	0.176	0.399	98.286			
39	0.144	0.328	98.614			
40	0.143	0.326	98.939			
41	0.138	0.315	99.254			
42	0.128	0.290	99.544			
43	0.112	0.254	99.798			
44	0.089	0.202	100.000			

Appendix 7: Rotated Factor Tables

Table 28A: Rotated Component Matrices with VARIMAX Rotation

	1	2	3	4	5	6	7	8	9	10
a04	0.753									
a01	0.701									
a05	0.700									
a03	0.694									
a06	0.666									
a08	0.653									
a02	0.621									
a07	0.516									
a11	0.432									
c14		0.685								
c07		0.638								
c12		0.601								
c04		0.597		0.464						
c15		0.589								
c03		0.549								
c02		0.506		0.416						
c13		0.478				0.405				
b10			0.731							
b11			0.722							
b13			0.636							
b12			0.574							
b09			0.539							
b08			0.472							
a14				0.819						
a12				0.784						
a13				0.760						
c06					0.709					
c05					0.697					
c08					0.587					
c01					0.489					
b06						0.792				
b07						0.762				
b05						0.745				
c10							0.769			
c09							0.711			
c11		0.461					0.607			
b04						0.404	0.409			
b01								0.721		
b03								0.699		
b02	0.413							0.664		
a09								0.404		
b14									0.888	
b15									0.851	
a10										0.661

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

a Rotation converged in 20 iterations.

Table 29A: Pattern matrix with OBLIMIN Rotation

	1	2	3	4	5	6	7	8	9	10
a04	0.764									
a03	0.720									
a05	0.640									
a01	0.633									
a02	0.616									
a06	0.574									
a08	0.559									
a07										
c10		0.785								
c09		0.701								
c11		0.620								
c13										
b04										
b06			0.830							
b07			0.809							
b05			0.769							
b14				0.946						
b15				0.890						
a14					0.874					
a12					0.822					
a13					0.797					
a09										
a10						0.621				
a11										
b10							-0.751			
b11							-0.719			
b13							-0.564			
b09							-0.509			
b12							-0.476			
b08							-0.441			
b01								-0.754		
b03								-0.720		
b02								-0.696		
c14									-0.566	
c07									-0.531	
c15									-0.518	
c12									-0.468	
c04									-0.462	-0.445
c03									-0.424	
c02										
c06										-0.735
c05										-0.730
c08										-0.607
c01										-0.401

Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization.

a Rotation converged in 20 iterations.

Appendix 8: Questionnaire Items with Orthogonal (VARIMAX)

Rotation

Table 30A: VARIMAX Rotated Component Matrix with Variables

Item No.	Item Name	Components									
		1	2	3	4	5	6	7	8	9	10
a04	Lecturers' Knowledge	0.75									
a01	Academic staff are polite and courteous	0.70									
a05	Lecturers' teaching ability	0.70									
a03	Students feel comfortable talk to lecturers	0.69									
a06	Preparation and organisation of classes	0.67									
a08	Lecturers and support staff are willing to help	0.65									
a02	Opportunity to participate in class discussions	0.62									
a07	Academic staff are concerned about student welfare and interests	0.52									
a11	Minimum contact difficulty of lecturers	0.43									
c14	Become more competent in one's field of study		0.68								
c07	Ability learn effectively on oneself, pursue ideas, and find the required information		0.64								
c12	Gained general IT skills		0.60								
c04	Ability to analyse quantitative problems		0.60		0.46						
c15	Achieved ones' own expected grades		0.59								
c03	Developed writing and speaking skills		0.55								
c02	Developed analytical and logical thinking		0.51		0.42						
c13	Gained specific IT skills		0.48				0.40				
b10	Comfortable lecture rooms			0.73							
b11	Quality equipment in lecture rooms			0.72							
b13	Campus facilities (e.g. parking, accomodation, café)			0.64							
b12	The university has an excellent physical layout			0.57							
b09	Quality equipment in computer labs			0.54							
b08	Computer Accessibility			0.47							
a14	Administration staff are courteous				0.82						
a12	Administration staff are sympathic and reassuring				0.78						
a13	Administration staff solve my problems at a promised time				0.76						
c06	Understand people of other racial and ethnic background better					0.71					
c05	Developed personal code of values and ethics					0.70					
c08	Ability to function as a member of a team					0.59					
c01	Acquired a broad general education in different fields					0.49					
b06	Relevant information provided when required						0.79				
b07	Problems solved at a promised time						0.76				
b05	Quiet library to study						0.74				
c10	Gained some knowledge and skills for a particular career							0.77			
c09	Guidance and information on career opportunities at university							0.71			
c11	Gained knowledge and skills for first job		0.46					0.61			
b04	Extensive Book collection in library						0.40	0.41			
b01	Useful course materials								0.72		
b03	Relevant course materials								0.70		
b02	Interesting course materials	0.41							0.66		
a09	Prompt Return of the works								0.40		
b14	Attitude of students sitting nearby									0.89	
b15	Disturbances during the lecture									0.85	
a10	Lecturer's Office Hours										0.66

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

a Rotation converged in 20 iterations.

Appendix 9: Multicollinearity Statistics

Table 31A: Pearson Correlation Matrix, Model 1

		a15	IT1	IT2	IT3	IT4
a15: Interaction Quality	Pearson Correlation	1	0.769	0.678	0.448	0.627
	Sig. (2-tailed)		0.000	0.000	0.000	0.000
	N	220	220	220	220	220
IT1: Academic Staff	Pearson Correlation	0.769	1	0.627	0.507	0.703
	Sig. (2-tailed)	0.000		0.000	0.000	0.000
	N	220	223	223	223	223
IT2: Administration staff	Pearson Correlation	0.678	0.627	1	0.393	0.486
	Sig. (2-tailed)	0.000	0.000		0.000	0.000
	N	220	223	223	223	223
IT3: Academic Staff Availability	Pearson Correlation	0.448	0.507	0.393	1	0.469
	Sig. (2-tailed)	0.000	0.000	0.000		0.000
	N	220	223	223	223	223
IT4: Course Content	Pearson Correlation	0.627	0.703	0.486	0.469	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	
	N	220	223	223	223	223

Table 32A: Pearson Correlation Matrix, Model 2

		b16	PE1	PE2	PE3
b16: Physical Environment Quality	Pearson Correlation	1	0.598	0.784	0.299
	Sig. (2-tailed)		0.000	0.000	0.000
	N	220	220	220	220
PE1: Librarary	Pearson Correlation	0.598	1	0.579	0.125
	Sig. (2-tailed)	0.000		0.000	0.062
	N	220	223	223	223
PE2: Physical Appealings	Pearson Correlation	0.784	0.579	1	0.236
	Sig. (2-tailed)	0.000	0.000		0.000
	N	220	223	223	223
PE3: Social Factors	Pearson Correlation	0.299	0.125	0.236	1
	Sig. (2-tailed)	0.000	0.062	0.000	
	N	220	223	223	223

Table 33A: Pearson Correlation Matrix, Model 3

		c16	OC1	OC2	OC3
c16: Outcome Quality	Pearson Correlation	1	0.656	0.777	0.593
	Sig. (2-tailed)		0.000	0.000	0.000
	N	217	217	217	217
OC1: Personal Development	Pearson Correlation	0.656	1	0.724	0.539
	Sig. (2-tailed)	0.000		0.000	0.000
	N	217	223	223	223
OC2: Academic Development	Pearson Correlation	0.777	0.724	1	0.633
	Sig. (2-tailed)	0.000	0.000		0.000
	N	217	223	223	223
OC3: Career Opportunities	Pearson Correlation	0.593	0.539	0.633	1
	Sig. (2-tailed)	0.000	0.000	0.000	
	N	217	223	223	223

Table 34A: Pearson Correlation Matrix, Model 4

		Service Quality	a15	b16	c16	Image
Service Quality	Pearson Correlation	1	0.643	0.617	0.681	0.538
	Sig. (2-tailed)		0.000	0.000	0.000	0.000
	N	220	220	220	220	220
a15: Interaction Quality	Pearson Correlation	0.643	1	0.575	0.621	0.449
	Sig. (2-tailed)	0.000		0.000	0.000	0.000
	N	220	223	223	223	223
b16: Physical Environment Quality	Pearson Correlation	0.617	0.575	1	0.658	0.464
	Sig. (2-tailed)	0.000	0.000		0.000	0.000
	N	220	223	223	223	223
c16: Outcome Quality	Pearson Correlation	0.681	0.621	0.658	1	0.497
	Sig. (2-tailed)	0.000	0.000	0.000		0.000
	N	220	223	223	223	223
Image	Pearson Correlation	0.538	0.449	0.464	0.497	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	
	N	220	223	223	223	223

Table 35A: Pearson Correlation Matrix, Model 5

		Price	Service Quality
Price	Pearson Correlation	1	0.509
	Sig. (2-tailed)		0.000
	N	223	223
Service Quality	Pearson Correlation	0.509	1
	Sig. (2-tailed)	0.000	
	N	223	223

Table 36A: Pearson Correlation Matrix, Model 6

		Satisfaction	Service Quality	Image	Price
Satisfaction	Pearson Correlation	1	0.868	0.528	0.491
	Sig. (2-tailed)		0.000	0.000	0.000
	N	220	220	220	220
Service Quality	Pearson Correlation	0.868	1	0.530	0.509
	Sig. (2-tailed)	0.000		0.000	0.000
	N	220	223	223	223
Image	Pearson Correlation	0.528	0.530	1	0.576
	Sig. (2-tailed)	0.000	0.000		0.000
	N	220	223	223	223
Price	Pearson Correlation	0.491	0.509	0.576	1
	Sig. (2-tailed)	0.000	0.000	0.000	
	N	220	223	223	223

Table 37A: Pearson Correlation Matrix, Model 7

		Future Attendance	Satisfaction
Future Attendance	Pearson Correlation	1	0.574
	Sig. (2-tailed)		0.000
	N	223	221
Satisfaction	Pearson Correlation	0.574	1
	Sig. (2-tailed)	0.000	
	N	221	221

Table 38A: Pearson Correlation Matrix, Model 8

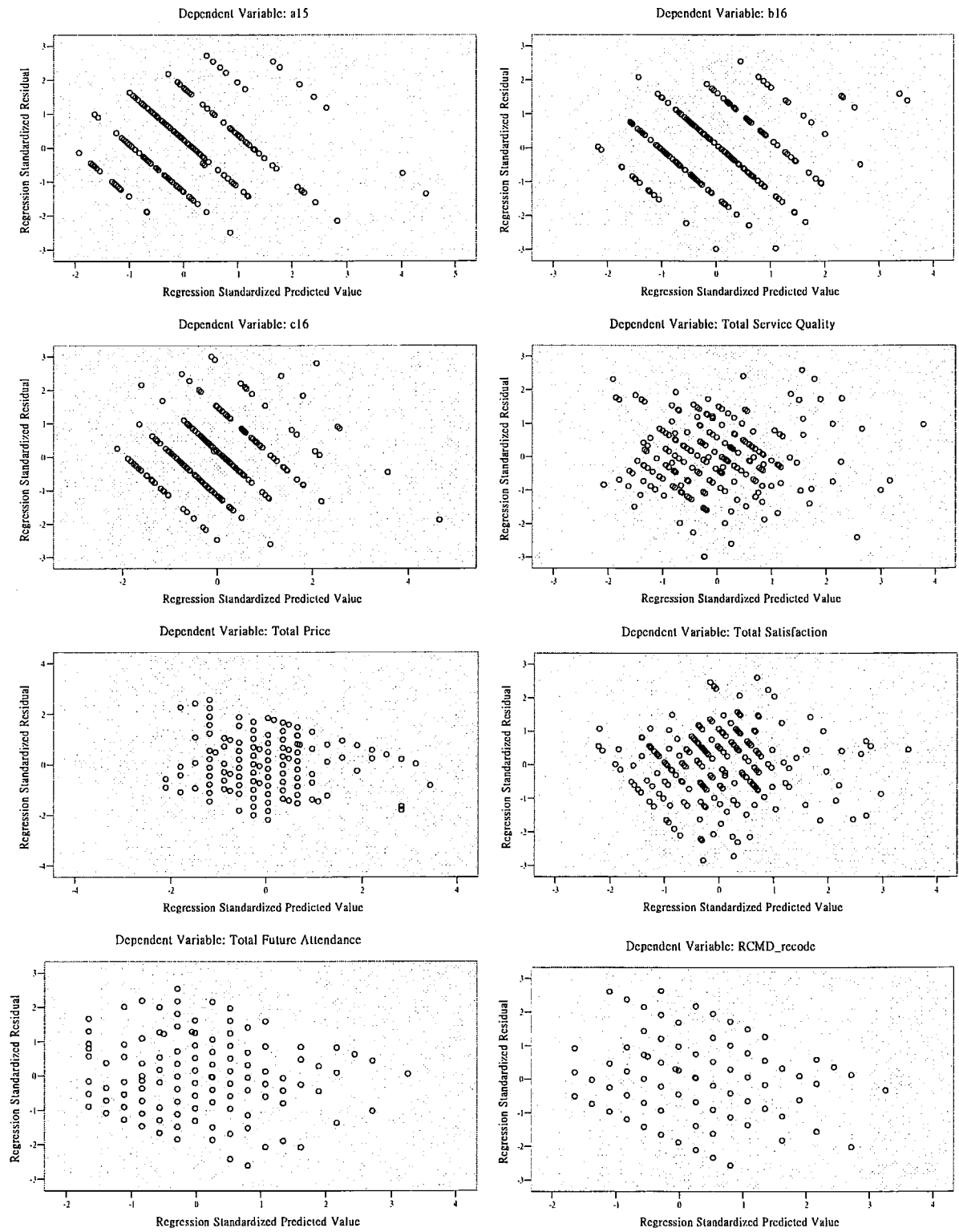
		Recommend	Satisfaction
Recommend	Pearson Correlation	1	0.644
	Sig. (2-tailed)		0.000
	N	222	222
Satisfaction	Pearson Correlation	0.644	1
	Sig. (2-tailed)	0.000	
	N	222	223

Table 39A: Multicollinearity Statistics

Model	Dependent Variables	Independent Variables	1/(1-R ²)	Collinearity Statistics		
				Tolerance	VIF	Condition Index
1	a15: Interaction Quality	Academic Staff	2.924	0.375	2.670	6.693
		Admin Staff		0.601	1.664	7.853
		Academic Staff Availability		0.715	1.399	8.818
		Course Content		0.466	2.146	12.812
2	b16: Physical Environment Quality	Library Atmosphere	2.907	0.665	1.505	5.111
		Physical Appealings		0.638	1.566	7.801
		Social Factors		0.945	1.058	8.909
3	c16: Outcome Quality	Personal Development	2.695	0.456	2.191	8.089
		Academic Development		0.373	2.683	9.154
		Career Opportunities		0.559	1.788	12.763
4	Service Quality	Interaction Quality	2.331	0.548	1.824	7.113
		Physical Environment Quality		0.479	2.086	8.905
		Outcome Quality		0.448	2.233	9.438
		Image		0.714	1.401	10.561
5	Price	Service Quality	1.344	1.000	1.000	6.216
6	Satisfaction	Service Quality	4.132	0.656	1.523	7.085
		Image		0.592	1.690	8.913
		Price		0.612	1.633	9.137
7	Future Attendance	Satisfaction	1.484	1.000	1.000	5.155
8	Recommend	Satisfaction	1.698	1.000	1.000	5.122

Appendix 10: Scatter Plots

Figure 9A: Residual Scatter Plots



Appendix 11: Normality Plots

Figure 10A: Residual Scatter Plots

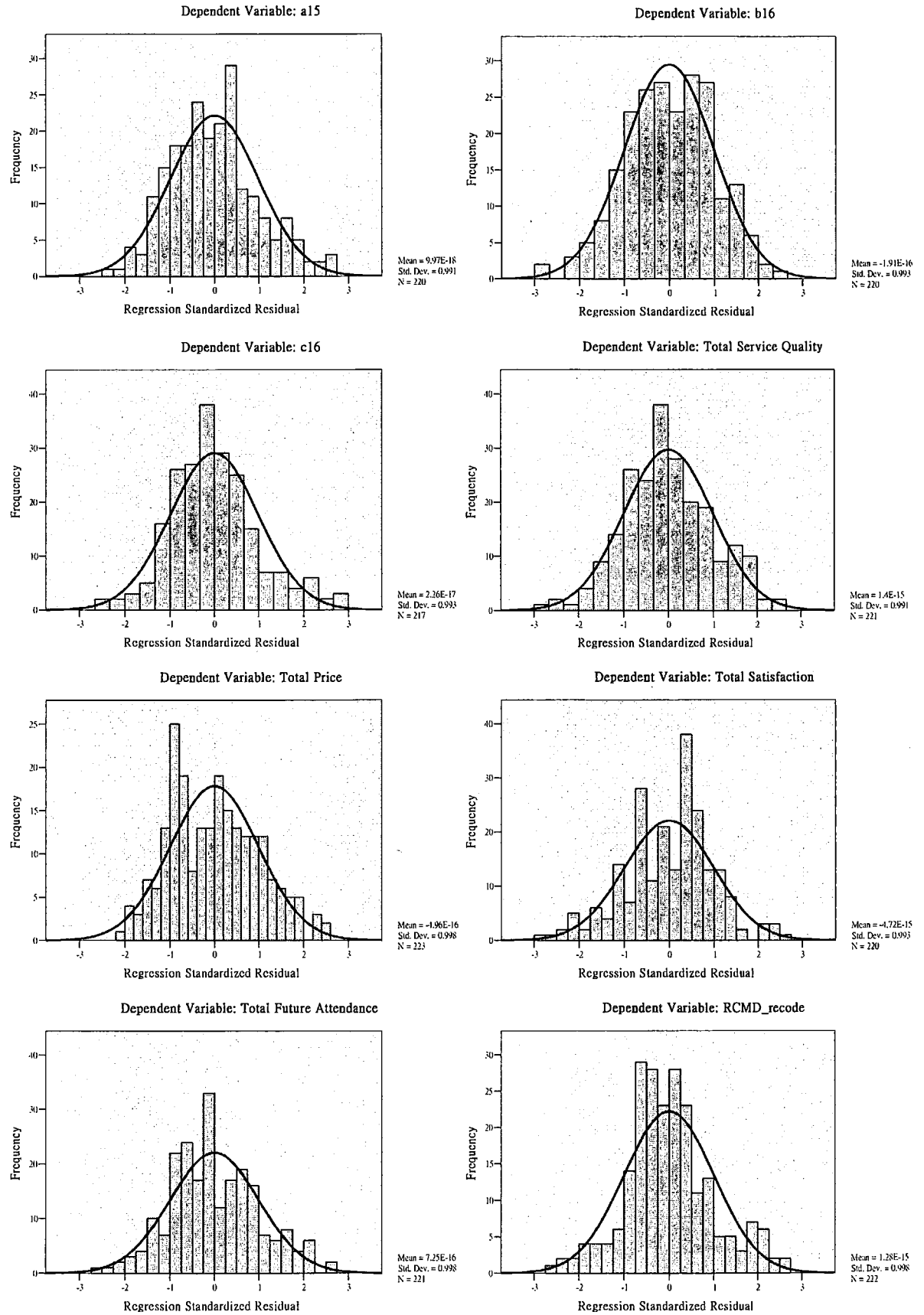
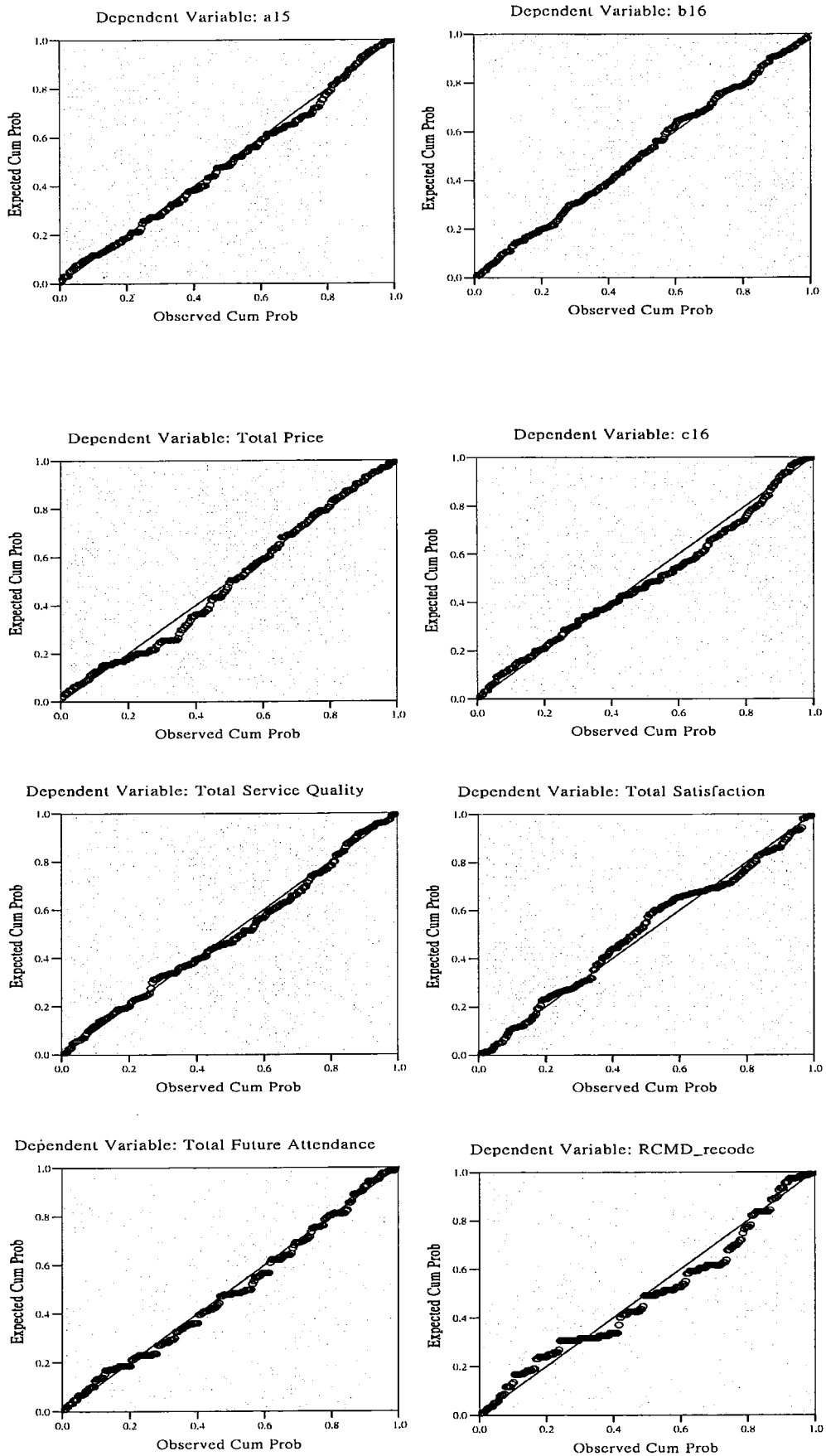


Figure 11A: Normal P-P Plot of Regression Standardised Residual



Appendix 12: Analysis of Variance Results

Table 40A: Students' Perceptions of Satisfaction and Pertaining Constructs

GENDER

Variable	Gender	Frequency	Mean	F	Sig.
Service Quality	Male	116	3.252	0.124	0.725
	Female	107	3.303		
	Total	223	3.276		
Satisfaction	Male	116	3.051	0.348	0.556
	Female	107	2.954		
	Total	223	3.004		
Image	Male	116	3.446	0.010	0.922
	Female	107	3.430		
	Total	223	3.438		
Price	Male	116	4.187	0.025	0.874
	Female	107	4.224		
	Total	223	4.205		
Future Attendance	Male	116	3.987	1.989	0.160
	Female	107	3.669		
	Total	223	3.835		
Recommend	Male	116	3.828	2.044	0.154
	Female	107	3.477		
	Total	223	3.659		

AGE

Variable	Age	Frequency	Mean	F	Sig.
Service Quality	18-24	157	3.282	0.017	0.895
	25+	66	3.261		
	Total	223	3.276		
Satisfaction	18-24	157	2.986	0.126	0.723
	25+	66	3.050		
	Total	223	3.004		
Image	18-24	157	3.462	0.216	0.643
	25+	66	3.382		
	Total	223	3.438		
Price	18-24	157	4.304	1.743	0.188
	25+	66	3.970		
	Total	223	4.205		
Future Attendance	18-24	157	3.813	0.088	0.767
	25+	66	3.886		
	Total	223	3.835		
Recommend	18-24	157	3.618	0.268	0.605
	25+	66	3.758		
	Total	223	3.659		

ETHNICITY

Variable	Ethnicity	Frequency	Mean	F	Sig.
Service Quality	Western	87	3.034	7.283	0.007***
	Asian	136	3.431		
	Total	223	3.276		
Satisfaction	Western	87	2.602	16.353	0.000***
	Asian	136	3.262		
	Total	223	3.004		
Image	Western	87	3.380	0.345	0.557
	Asian	136	3.475		
	Total	223	3.438		
Price	Western	87	3.727	11.435	0.001***
	Asian	136	4.511		
	Total	223	4.205		
Future Attendance	Western	87	3.486	6.244	0.013**
	Asian	136	4.057		
	Total	223	3.835		
Recommend	Western	87	3.172	10.458	0.001***
	Asian	136	3.971		
	Total	223	3.659		

YEAR OF STUDY

Variable	Year	Frequency	Mean	F	Sig.
Service Quality	200 level	91	3.409	2.313	0.130
	300 level	132	3.185		
	Total	223	3.276		
Satisfaction	200 level	91	3.110	1.133	0.288
	300 level	132	2.932		
	Total	223	3.004		
Image	200 level	91	3.466	0.083	0.774
	300 level	132	3.419		
	Total	223	3.438		
Price	200 level	91	4.129	0.298	0.586
	300 level	132	4.258		
	Total	223	4.205		
Future Attendance	200 level	91	4.113	4.271	0.040**
	300 level	132	3.643		
	Total	223	3.835		
Recommend	200 level	91	3.945	3.775	0.053*
	300 level	132	3.462		
	Total	223	3.659		

MAJOR

Variable	Major	Frequency	Mean	F	Sig.			
Service Quality	Accounting	34	3.333	0.504	0.899			
	Agribusiness	6	3.689					
	Business Management	34	3.351					
	Computing	6	2.956					
	Finance	51	3.388					
	Economics	8	3.000					
	Hospitality Management	10	2.980					
	International Business	8	3.542					
	Marketing	22	3.103					
	Property Studies	17	3.165					
	Supply Chain Management	15	3.378					
	Tourism Management	12	2.983					
	Total	223	3.276					
	Satisfaction	Accounting	34			2.912	0.584	0.841
		Agribusiness	6			3.389		
Business Management		34	3.108					
Computing		6	2.833					
Finance		51	3.131					
Economics		8	2.792					
Hospitality Management		10	2.600					
International Business		8	3.500					
Marketing		22	2.923					
Property Studies		17	2.985					
Supply Chain Management		15	3.130					
Tourism Management		12	2.500					
Total		223	3.004					
Image		Accounting	34	3.226	1.192	0.294		
		Agribusiness	6	3.458				
	Business Management	34	3.584					
	Computing	6	3.060					
	Finance	51	3.338					
	Economics	8	2.594					
	Hospitality Management	10	3.150					
	International Business	8	4.156					
	Marketing	22	3.619					
	Property Studies	17	3.846					
	Supply Chain Management	15	3.555					
	Tourism Management	12	3.500					
	Total	223	3.438					
	Price	Accounting	34	4.176			1.327	0.211
		Agribusiness	6	3.750				
Business Management		34	4.029					
Computing		6	4.833					
Finance		51	4.480					
Economics		8	2.563					
Hospitality Management		10	3.800					
International Business		8	4.938					
Marketing		22	4.147					
Property Studies		17	4.029					
Supply Chain Management		15	4.833					
Tourism Management		12	4.042					
Total		223	4.205					
Future Attendance		Accounting	34	3.515	0.788	0.652		
		Agribusiness	6	4.135				
	Business Management	34	3.794					
	Computing	6	3.250					
	Finance	51	4.104					
	Economics	8	3.688					
	Hospitality Management	10	4.150					
	International Business	8	4.750					
	Marketing	22	3.477					
	Property Studies	17	3.647					
	Supply Chain Management	15	4.233					
	Tourism Management	12	3.500					
	Total	223	3.835					
	Recommend	Accounting	34	3.471			0.763	0.677
		Agribusiness	6	3.500				
Business Management		34	3.618					
Computing		6	3.167					
Finance		51	4.059					
Economics		8	3.125					
Hospitality Management		10	3.800					
International Business		8	4.500					
Marketing		22	3.227					
Property Studies		17	3.353					
Supply Chain Management		15	4.067					
Tourism Management		12	3.333					
Total		223	3.659					

Table 41A: Students' Perceptions of the Primary Dimensions of Service Quality

GENDER					
Variable	Gender	Frequency	Mean	F	Sig.
Interaction Quality	Male	116	2.895	0.089	0.766
	Female	107	2.849		
	Total	223	2.873		
Physical Environment Quality	Male	116	2.957	0.010	0.921
	Female	107	2.972		
	Total	223	2.964		
Outcome Quality	Male	116	2.931	0.000	0.990
	Female	107	2.933		
	Total	223	2.932		

Age					
Variable	Age	Frequency	Mean	F	Sig.
Interaction Quality	18-24	157	2.904	0.368	0.545
	25+	66	2.801		
	Total	223	2.873		
Physical Environment Quality	18-24	157	2.962	0.002	0.962
	25+	66	2.970		
	Total	223	2.964		
Outcome Quality	18-24	157	2.942	0.029	0.865
	25+	66	2.909		
	Total	223	2.932		

ETHNICITY					
Variable	Ethnicity	Frequency	Mean	F	Sig.
Interaction Quality	Western	87	2.721	2.506	0.115
	Asian	136	2.971		
	Total	223	2.873		
Physical Environment Quality	Western	87	2.701	7.904	0.005**
	Asian	136	3.132		
	Total	223	2.964		
Outcome Quality	Western	87	2.792	1.634	0.203
	Asian	136	3.022		
	Total	223	2.932		

YEAR OF STUDY					
Variable	Year	Frequency	Mean	F	Sig.
Interaction Quality	200 level	91	3.052	3.752	0.054*
	300 level	132	2.750		
	Total	223	2.873		
Physical Environment Quality	200 level	91	3.055	0.985	0.322
	300 level	132	2.902		
	Total	223	2.964		
Outcome Quality	200 level	91	3.196	6.420	0.012**
	300 level	132	2.750		
	Total	223	2.932		

MAJOR					
Variable	Major	Frequency	Mean	F	Sig.
Interaction Quality	Accounting	34	2.820	1.214	0.279
	Agribusiness	6	3.500		
	Business Management	34	2.824		
	Computing	6	2.167		
	Finance	51	2.860		
	Economics	8	2.625		
	Hospitality Management	10	2.800		
	International Business	8	4.000		
	Marketing	22	2.864		
	Property Studies	17	3.000		
	Supply Chain Management	15	2.867		
	Tourism Management	12	2.583		
	Total	223	2.873		
	Physical Environment Quality	Accounting	34		
Agribusiness		6	3.667		
Business Management		34	2.941		
Computing		6	2.833		
Finance		51	3.176		
Economics		8	2.500		
Hospitality Management		10	2.500		
International Business		8	3.250		
Marketing		22	2.955		
Property Studies		17	2.765		
Supply Chain Management		15	3.133		
Tourism Management		12	2.500		
Total		223	2.964		
Outcome Quality		Accounting	34	2.853	0.789
	Agribusiness	6	3.167		
	Business Management	34	3.029		
	Computing	6	3.167		
	Finance	51	2.940		
	Economics	8	2.250		
	Hospitality Management	10	2.600		
	International Business	8	3.375		
	Marketing	22	2.773		
	Property Studies	17	3.059		
	Supply Chain Management	15	3.467		
	Tourism Management	12	2.494		
	Total	223	2.932		

Table 42A: Students' Perceptions of Sub-dimensions of Service Quality

GENDER					
Variable	Gender	Frequency	Mean	F	Sig.
Academic Staff	Male	116	2.672	1.451	0.230
	Female	107	2.524		
	Total	223	2.601		
Administration Staff	Male	116	2.828	0.280	0.597
	Female	107	2.912		
	Total	223	2.868		
Academic Staff Availability	Male	116	2.856	1.864	0.174
	Female	107	3.062		
	Total	223	2.955		
Course Content	Male	116	2.742	2.497	0.115
	Female	107	2.542		
	Total	223	2.646		
Library Atmosphere	Male	116	2.856	1.568	0.212
	Female	107	3.062		
	Total	223	2.955		
Physically Appealing	Male	116	3.069	0.008	0.929
	Female	107	3.057		
	Total	223	3.063		
Social Factors	Male	116	3.078	2.816	0.095*
	Female	107	2.789		
	Total	223	2.939		
Personal Development	Male	116	2.758	0.240	0.625
	Female	107	2.817		
	Total	223	2.786		
Academic Development	Male	116	2.753	0.171	0.680
	Female	107	2.702		
	Total	223	2.728		
Career Opportunities	Male	116	2.946	0.893	0.346
	Female	107	3.082		
	Total	223	3.011		

AGE					
Variable	Age	Frequency	Mean	F	Sig.
Academic Staff	18-24	157	2.562	0.931	0.336
	25+	66	2.692		
	Total	223	2.601		
Administration Staff	18-24	157	2.868	0.000	0.999
	25+	66	2.869		
	Total	223	2.868		
Academic Staff Availability	18-24	157	2.827	0.130	0.719
	25+	66	2.758		
	Total	223	2.806		
Course Content	18-24	157	2.646	0.000	0.997
	25+	66	2.646		
	Total	223	2.646		
Library Atmosphere	18-24	157	2.916	0.539	0.464
	25+	66	3.048		
	Total	223	2.955		
Physically Appealing	18-24	157	3.030	0.528	0.468
	25+	66	3.143		
	Total	223	3.063		
Social Factors	18-24	157	2.962	0.164	0.686
	25+	66	2.885		
	Total	223	2.939		
Personal Development	18-24	157	2.815	0.557	0.456
	25+	66	2.716		
	Total	223	2.786		
Academic Development	18-24	157	2.742	0.113	0.738
	25+	66	2.697		
	Total	223	2.728		
Career Opportunities	18-24	157	3.007	0.007	0.933
	25+	66	3.021		
	Total	223	3.011		

ETHNICITY					
Variable	Ethnicity	Frequency	Mean	F	Sig.
Academic Staff	Western	87	2.558	0.311	0.578
	Asian	136	2.628		
	Total	223	2.601		
Administration Staff	Western	87	2.736	1.802	0.181
	Asian	136	2.953		
	Total	223	2.868		
Academic Staff Availability	Western	87	2.975	2.390	0.124
	Asian	136	2.699		
	Total	223	2.806		
Course Content	Western	87	2.695	0.384	0.536
	Asian	136	2.615		
	Total	223	2.646		
Library Atmosphere	Western	87	2.853	0.999	0.319
	Asian	136	3.020		
	Total	223	2.955		
Physically Appealing	Western	87	3.067	0.002	0.966
	Asian	136	3.061		
	Total	223	3.063		
Social Factors	Western	87	2.759	2.829	0.094*
	Asian	136	3.055		
	Total	223	2.939		
Personal Development	Western	87	2.763	0.096	0.757
	Asian	136	2.801		
	Total	223	2.786		
Academic Development	Western	87	2.523	7.477	0.007***
	Asian	136	2.860		
	Total	223	2.728		
Career Opportunities	Western	87	2.630	19.692	0.000***
	Asian	136	3.255		
	Total	223	3.011		

YEAR OF STUDY					
Variable	Year	Frequency	Mean	F	Sig.
Academic Staff	200 level	91	2.770	5.353	0.022**
	300 level	132	2.484		
	Total	223	2.601		
Administration Staff	200 level	91	2.983	1.447	0.230
	300 level	132	2.789		
	Total	223	2.868		
Academic Staff Availability	400 level	91	2.932	1.426	0.234
	500 level	132	2.720		
	Total	223	2.806		
Course Content	200 level	91	2.916	13.115	0.000***
	300 level	132	2.460		
	Total	223	2.646		
Library Atmosphere	200 level	91	2.917	0.150	0.699
	300 level	132	2.981		
	Total	223	2.955		
Physically Appealing	200 level	91	3.169	1.551	0.214
	300 level	132	2.990		
	Total	223	3.063		
Social Factors	200 level	91	2.890	0.223	0.638
	300 level	132	2.973		
	Total	223	2.939		
Personal Development	200 level	91	3.065	15.789	0.000***
	300 level	132	2.593		
	Total	223	2.786		
Academic Development	200 level	91	2.973	11.580	0.001***
	300 level	132	2.560		
	Total	223	2.728		
Career Opportunities	200 level	91	3.011	0.000	1.000
	300 level	132	3.011		
	Total	223	3.011		

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Variable	Major	Frequency	Mean	F	Sig.
Academic Staff	Accounting	34	2.636	1.465	0.147
	Agribusiness	6	2.704		
	Business Management	34	2.650		
	Computing	6	1.815		
	Finance	51	2.666		
	Economics	8	2.111		
	Hospitality Management	10	2.389		
	International Business	8	3.250		
	Marketing	22	2.343		
	Property Studies	17	2.732		
	Supply Chain Management	15	2.889		
	Tourism Management	12	2.417		
	Total	223	2.601		
Administration Staff	Accounting	34	3.045	0.889	0.552
	Agribusiness	6	2.867		
	Business Management	34	2.911		
	Computing	6	2.222		
	Finance	51	2.876		
	Economics	8	2.583		
	Hospitality Management	10	2.995		
	International Business	8	3.792		
	Marketing	22	2.803		
	Property Studies	17	2.627		
	Supply Chain Management	15	2.822		
	Tourism Management	12	2.528		
	Total	223	2.868		
Academic Staff Availability	Accounting	34	2.941	1.644	0.088
	Agribusiness	6	3.833		
	Business Management	34	2.818		
	Computing	6	2.667		
	Finance	51	2.608		
	Economics	8	1.750		
	Hospitality Management	10	2.300		
	International Business	8	3.625		
	Marketing	22	2.909		
	Property Studies	17	3.235		
	Supply Chain Management	15	2.800		
	Tourism Management	12	2.583		
	Total	223	2.806		
Course Content	Accounting	34	2.806	1.170	0.310
	Agribusiness	6	3.500		
	Business Management	34	2.527		
	Computing	6	2.167		
	Finance	51	2.538		
	Economics	8	2.208		
	Hospitality Management	10	2.750		
	International Business	8	2.688		
	Marketing	22	2.507		
	Property Studies	17	2.691		
	Supply Chain Management	15	2.950		
	Tourism Management	12	2.792		
	Total	223	2.646		
Library	Accounting	34	3.061	0.951	0.492
	Agribusiness	6	3.278		
	Business Management	34	2.860		
	Computing	6	2.167		
	Finance	51	3.019		
	Economics	8	2.250		
	Hospitality Management	10	3.053		
	International Business	8	3.703		
	Marketing	22	2.894		
	Property Studies	17	2.961		
	Supply Chain Management	15	3.153		
	Tourism Management	12	2.632		
	Total	223	2.955		

Variable	Major	Frequency	Mean	F	Sig.
Physical Appealing	Accounting	34	3.319	0.579	0.845
	Agribusiness	6	3.250		
	Business Management	34	3.044		
	Computing	6	2.694		
	Finance	51	3.116		
	Economics	8	2.562		
	Hospitality Management	10	2.967		
	International Business	8	3.083		
	Marketing	22	3.063		
	Property Studies	17	2.912		
	Supply Chain Management	15	3.167		
	Tourism Management	12	2.750		
	Total	223	3.063		
Social Factors	Accounting	34	2.632	1.107	0.357
	Agribusiness	6	3.417		
	Business Management	34	2.676		
	Computing	6	3.417		
	Finance	51	3.038		
	Economics	8	3.063		
	Hospitality Management	10	2.400		
	International Business	8	3.000		
	Marketing	22	3.250		
	Property Studies	17	3.118		
	Supply Chain Management	15	3.433		
	Tourism Management	12	2.542		
	Total	223	2.939		
Personal Development	Accounting	34	3.059	0.693	0.745
	Agribusiness	6	3.125		
	Business Management	34	2.683		
	Computing	6	2.792		
	Finance	51	2.766		
	Economics	8	2.594		
	Hospitality Management	10	2.750		
	International Business	8	2.656		
	Marketing	22	2.614		
	Property Studies	17	2.926		
	Supply Chain Management	15	2.867		
	Tourism Management	12	2.479		
	Total	223	2.786		
Academic Development	Accounting	34	2.816	0.995	0.452
	Agribusiness	6	3.095		
	Business Management	34	2.705		
	Computing	6	2.635		
	Finance	51	2.730		
	Economics	8	2.250		
	Hospitality Management	10	2.357		
	International Business	8	2.960		
	Marketing	22	2.788		
	Property Studies	17	2.687		
	Supply Chain Management	15	3.121		
	Tourism Management	12	2.333		
	Total	223	2.728		
Career Opportunities	Accounting	34	2.843	1.135	0.335
	Agribusiness	6	3.056		
	Business Management	34	3.002		
	Computing	6	3.390		
	Finance	51	3.235		
	Economics	8	2.833		
	Hospitality Management	10	2.468		
	International Business	8	2.750		
	Marketing	22	2.821		
	Property Studies	17	3.177		
	Supply Chain Management	15	3.467		
	Tourism Management	12	2.639		
	Total	223	3.011		