A Comprehensive Analysis of Student Loyalty and its Determinants in China's Higher Education Sector

---

A thesis
submitted in partial fulfilment
of the requirements for the Degree of
Doctor of Philosophy

at
Lincoln University
by
Jiani Yan

Lincoln University
2017

Abstract of a thesis submitted in partial fulfilment of the requirements for the Degree of Doctor of Philosophy.

A Comprehensive Analysis of Student Loyalty and its Determinants in China's Higher Education Sector

by

Jiani Yan

The sustained growth in the Chinese economy has led to an increasing demand for higher education in China and an increase in the number of institutions offering higher qualifications (Lai & Huang, 2009). Therefore, it is important for higher education institutions (HEIs) to create student loyalty in order to survive in an increasing competitive environment. Student loyalty has been identified as an important strategic theme for HEIs (Helgensen, 2008). Retaining students can develop a solid and predictable financial basis and gain a strategic competitive advantage for the HEIs (Hennig-Thuran et al., 2001). Empirical research on student loyalty and its determinants in the context of HEIs is required if these institutions are going to survive the intense competition within China's higher education sector (Carvalho & de Oliveira Mota, 2010; Helgesen, 2006).

This research uses a hierarchical modelling framework to identify the primary dimensions of Service Quality, and to analyse the interrelationships among the five higher order constructs: Service Quality, Student Satisfaction, Student Involvement, University Image, and Student Loyalty in China's higher education sector. The possible impacts of mediating variables are also tested. These are: Student Satisfaction on the relationship between Service Quality and Student Loyalty; Student Involvement on the relationship between Service Quality and Student Satisfaction and Service Quality and University Image. Furthermore, a multi-group analysis is conducted in order to investigate perceptual differences of the interrelationships among the higher order constructs between different genders and different years-of-study.

420 university students at Shanghai University and Shanghai Normal University in China participated in the survey. Four focus group interviews and a pilot test preceded the data collection process.

Exploratory factor analysis, confirmatory analysis, and structural equation modelling were used as the data analysis techniques in this study.

The results confirm four primary dimensions of higher education service quality: Interaction Quality, Physical Environment Quality, Outcome Quality, and Social Factors Quality. The four primary dimensions that drive the overall higher education service quality vary in importance. Outcome Quality is the most important indicator for measuring students' overall perceptions of higher education service quality, followed by Social Factors Quality, Interaction Quality, and Physical Environment Quality. Moreover, University Image and Student Satisfaction are the two key determinants of Student Loyalty. University Image and Service Quality are two significant determinants of Student Satisfaction. Service Quality and Student Involvement are two important determinants of University Image. Service Quality is the significant determinant of Student Involvement. Student Satisfaction has a partial mediating effect on the relationship between Service Quality and Student Loyalty. Student Involvement has a partial mediating effect on the relationship between Service Quality and Student Satisfaction, Service Quality and University Image. Lastly, the results of multi-group analysis show that the only difference across the Gender groups and Years-of-study groups is observed for the path from Student Involvement to University Image.

Keywords: China, Higher Education Service Quality, Social Factors Quality, Student Involvement, Student Loyalty, Comprehensive Hierarchical Model, Structural Equation Modelling, Multi-group analysis.

Acknowledgements

I would like to express my gratitude to those lovely people who have provided me with unfailing support and continuous encouragement throught my PhD journey.

My deepest appriciation goes to my main supervisor, Mr Michael D. Clemes, whose expertise, understanding, generous guidance and enthusiastic support lead me all the way to the completion of my thesis. Whenever I ran into a trouble spot or had a question about my research, I can always pop into Mr Clemes' office or call him. He consistently provides me with sharp ideas and detailed reviews that really helped to solve my difficulties. Most importantly, Mr Michael D. Clemes always has faith in me, his inspiration and guidance was essential to my success here. I would also like to thank Dr. Baiding Hu, my associate supervisor, for his kindness, enthusiastic support, and his comprehensive comments.

My most sincere appreciation goes to my parents Mr. Zhiliang Yan (my father) and Mrs. Xiling Zhang (my mother) who inspire me to study a PhD after I completed my Honours study. Without my parents' great trsut and support, I would never pass through several obstacles during my PhD study.

Special appreciation goes to Prof. Christopher Gan, thank you for Prof. Gan's kindness and assistance. He recommended me to be a lecturer in a college which really helped me relieve some stress from studying and reduce the burden on my living costs.

Moreover, I would like to thank all of my friends at Lincoln University, in New Zealand, and in China for their support and encouragement.

Table of Contents

List of Tables

List of Figures

Chapter 1

Introduction

1.1 Problem Setting

Johnes (2006) identifies higher education institutions (HEIs) as one of the important components of an economy since they produce both human capital and new knowledge; hence, HEIs play an important role in knowledge-based societies and in growing economies in today's world. Ibrahim, Rahmanb, and Yasinc (2012) note that higher education service quality is fundamental to a country's development. Drăgan, Ivana, and Arba (2014) also emphasize the importance of higher education, since a direct contribution can be made by education to the development of excellence and knowledge, and hence to a country's social and economic development. Higher education has become a global business (Mohamad Yusof, Hassan, Abdul Rahman, & Ghouri, 2012) and HEIs need to deliver high service quality to students to gain competitiveness in today's higher education market (Al-Alak & Alnaser, 2012).

Researchers have studied the complex interrelationships among the higher order service marketing constructs (such as service quality, customer perceived value, corporate image, customer satisfaction, and customer loyalty) in various service industries, (e.g. Clemes, Cohen, & Wang, 2013; Clemes, Brush, & Collins, 2011; Caruana, 2004; Cronin, Brady, & Hult, 2000; Fornell, Johnson, Anderson, Cha, & Bryant, 1996). The studies have strived to provide a theoretical framework, supported by empirical evidence, in order to improve the understanding of the complex interrelationships that exist among the service marketing constructs. Many suggestions have been made in previous studies about the need for new studies to investigate the relationships among the service marketing constructs in global service industries as well as the need to develop much deeper insight into the marketing constructs (Ryu, Han, & Kim, 2008; Chow, Lau, Thamis, Sha, & Yun, 2007; Dagger, Sweeney, & Johnson, 2007; Aydin & Ozer, 2005; Lee, Shanklin, & Dallas, 2003; Caruana, Money, & Berthon, 2000; Nguyen & LeBlanc, 1998; Oh, 1998; Dabholkar, Thorpe, & Rentz, 1996; Fornell et al., 1996; Babakus & Boller, 1992; Cronin & Taylor, 1992).

The rapid growth of the global higher education market has attracted the interests of many marketing academics. Researchers have studied aspects of the higher education market in New Zealand (Clemes, Gan, & Kao, 2008; Clemes, Ozanne, & Tram, 2001), Australia (Arambewela & Hall, 2009; Peng, 2008), Europe (Zineldin, Akdag, & Vasicheva, 2011; Brochado, 2009; Angell, Heffernan, & Megicks, 2008; Marzo-Navarro, Pedraja-Iglesias, & Rivera-Torres, 2005), Germany (Drăgan et al., 2014; Voss, Gruber, & Szmigin, 2007), Italy (Di Pietro, Guglielmetti Mugion, Musella, Renzi, & Vicard,

2015; Lupo, 2013), Portugal (Eurico, Da Silva, & Do Valle, 2015), Turkey (Temizer & Turkyilmaz, 2012), Brazil (Oliveira & Ferreira, 2009; Perin, Sampaio, Simões, & De Pólvora, 2012), Egypt (Mostafa, 2007), South Africa and Swaziland (de Jagera & Gbadamosib, 2013), North America (Cardona & Bravo, 2012; Letcher & Neves, 2010; Rojas-Méndez, Vasquez-Parraga, Kara, & Cerda-Urrutia, 2009; LeBlanc & Nguyen, 1997), Singapore (Yeo, 2009; Tan & Kek, 2004), Malaysia (Ibrahim et al., 2012; Rajab, Panatik, Rahman, Rahman, Shaari, & Saat, 2011), Thailand (Yousapronpaiboon, 2014), India (Ravindran & Kalpana, 2012), Pakistan (Butt & Rehman, 2010), Japan (Sultan & Wong, 2010), and China (Li, Whalley, & Xing, 2014; Clemes et al., 2013; Lai & Huang, 2009). Marketing researchers have also analyzed the relationship between service marketing constructs (e.g. service quality and satisfaction) in the higher education sector, in order to help HEIs succeed in the competitive marketplace (Drăgan et al., 2014; Yousapronpaiboon, 2014; Lupo, 2013; Ibrahim et al., 2012; Temizer & Turkyilmaz, 2012; Ravindran & M, 2012; Cardona & Bravo, 2012; Rajab et al., 2011; Butt & Rehman, 2010).

However, though the importance of higher education service quality is becoming more widely recognized, the conceptualisation and the measurement of the construct has not been fully investigated (Abili, Thani, Mokhtarian, & Rashidi, 2011). In particular, only a limited number of empirical studies have been published on students' perceptions of service quality and the other higher order marketing constructs in China's higher education sector (Clemes et al., 2013; Gao & Wei, 2007; Kwan & Ng, 1999).

Furthermore, the concept of student satisfaction and student loyalty has attracted much attention in recent years (Temizer & Turkyilmaz, 2012). Helgesen (2008) reports that student loyalty is becoming an increasingly significant strategy theme for HEIs. Therefore, it is critical for HEIs to gain a much deeper insight into student loyalty as well as the drivers influencing student loyalty, in order to obtain a competitive advantage (Marzo-Navarro et al., 2005; Schertzer & Schertzer, 2004; Hennig-Thuran et al., 2001).

Increasing attention has been given to student loyalty in the fields of educational management (Helgesen & Nesset, 2007b; Lin & Tsai, 2006; Nguyen & LeBlanc, 2001). Although these studies contribute to the understanding of student loyalty, empirical research on student loyalty in the context of HEIs is still required due to the present intense competition within the higher education sector (Carvalho & de Oliveira Mota, 2010). Despite the growing importance of student loyalty as the strategic theme to HEIs, there is a lack of empirical research on student loyalty using more structural-based empirical analyses (Helgesen, 2006).

The following sections begin with a discussion of the Chinese higher education market. The research gaps and the objectives of this study are then stated, and finally, the contributions that this study will make to the service marketing literature are discussed.

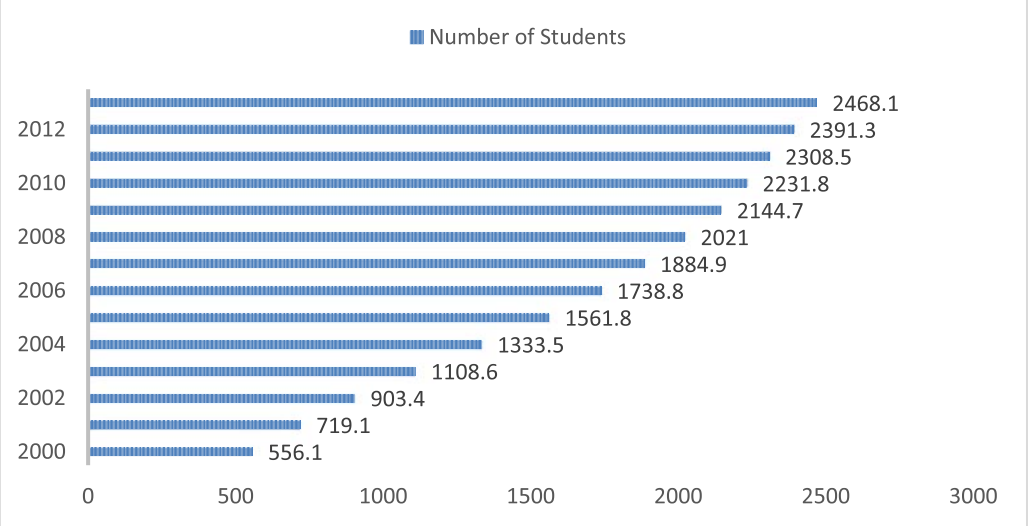
1.2 The Chinese Higher Education Market

From 1949 to 1966, enrolment in higher education in China maintained increased at a steady rate. However, because of the Great Cultural Revolution (1966-1976), all universities in China were shut down for varying periods. Though some universities began to recruit students using admission criteria after 1970-71, no high school graduates were allowed to go directly to university until 1977.

The national university entrance exam was not restored until 1977, and the Chinese education system has worked to return to normal since then (Zhong, 2011). In 1978, China adopted an open-door policy for the nation's economic development, seeking economic reform and the opening of markets, along with its education system undergoing a major expansion and transformation (Li et al., 2014). The transformation of China's education system can be observed from three aspects: scale expansion, an increase in tuition and other expenditure, and changes in the mechanism for matching graduates with employers (Li et al., 2014).

The Chinese Communist Party also realizes the contribution of higher education in economic modernization and higher education is now playing a more essential role in China's economic and social development (Lai & Huang, 2009). A series of progressive changes in government regulations was made in order to assist the education system to adjust to national economic and social development goals in China (Ministry of Education of the People's Republic of China, 1985; 1993; 2009). In 1998, the Chinese government began a student recruitment expansion plan, and encouraged students to enrol in HEIs and pursue higher education (Lai & Huang, 2009).

The Chinese higher education system has experienced unprecedented expansion in the past three decades (Zhong, 2011). The higher education market in China is growing rapidly. For example, the number of HEIs increased from 1041 in 2000, to 2491 in 2013; while the number of total student enrolments in HEIs increased from 5,561,000 in 2000 to 24,680,726 in 2013 (Ministry of Education of the People's Republic of China, 2014). The enrolment rates of colleges and universities in China are comparable to those of many developed countries, which indicate that China has entered the stage of popular education as suggested by Zhong, (2011). Figure 1-1 shows the changes in the total number of student enrolments in HEIs in China from 2000 to 2013.



(10000 persons)

Source: Ministry of Education of the People's Republic of China, 2014

Figure 1-1 Total Number of Student Enrolments in HEIs in China from Year 2000 to 2013

According to a statistical communiqué on national educational development in 2013, the gross enrolment rate reached 34.5%, and 34,600,000 students were pursuing higher education in various types of colleges and universities around China. There were 2,491 regular colleges and universities that provide formal higher education, up by 49 over the previous year. In 2013, the total number of students enrolled by regular colleges and universities reached 6,998,300, an increase of 110,000, or 1.6% over the previous year. The total number of students at these schools reached 24,680,700, increasing by 767,600, or 3.21%. A total of 6,387,200 students graduated in the year, an increase of 139,900, or 2.24% (Ministry of Education of the People's Republic of China, 2014).

The average number of full-time students for four-year undergraduate colleges and universities was 14,261 in 2013. There were 2,296,300 teachers and administrative staff in China's regular colleges and universities, an increase of 41,900 compared with the previous year. The total floor space of buildings in regular colleges and universities stood at 841,549,500 square meters, an increase of 30,945,300 square meters compared with the previous year. Equipment and apparatus for teaching and research were valued at 3309.58 billion RMB, up by 374.21 billion RMB over the previous year (Ministry of Education of the People's Republic of China, 2014).

Moreover, Duan (2003) notes that with the establishment of modern universities at the end of the 20th century, the higher education market in China has experienced political change, social adjustment, and economic reforms. Li, Whalley, Zhang, & Zhao (2011) note that the focus on a quantity-education orientation in the pre-1999 period has been changed to a quality-education

orientation in the post-1999 period. Brandenburg and Zhu (2007) found that two state programs, Project 211 [1] and Project 985 [2] are the two most important strategies introduced for modernizing and improving the quality of higher education in China. Special financial support is offered to a group of prestigious universities by these two projects in order to enhance the quality of teaching and research (Brandenburg & Zhu, 2007).

Zha (2009) notes that the developing market economy has contributed to the demand for different types of skills in the labour market. Thus, disciplines and specializations have been designed and rearranged in China's higher education institutions to meet the emerging needs of the labour market (Mok, 2000). Furthermore, Mok (2000) notes that higher education in China has been going through a process of marketization. The changes in the higher education sector (as a result of marketization) have required the establishment of a direct relationship between educational service providers and receivers (Mok, 2000). Therefore, the changes in the marketplace has led HEI's to consider students as clients or customers rather than just being students (Chung & McLarney, 2000; Díaz-Méndez & Gummesson, 2012; Helgesen, 2008; Schlesinger, Cervera, & Iniesta, 2015; Yousapronpaiboon, 2014).

1.3 Research Gaps

The first research gap relates to conceptualising and measuring social factors quality as a fourth primary dimension of higher education service quality in China's higher education sector. Studies on measuring social factors in an educational context and examining the construct's impact on students' perceptions of higher education service quality are sparse (Clemes et al., 2013; Clemes et al., 2008). To date, social factors have not been identified or measured as a primary dimension of higher education service quality. Closing this research gap is important, as many social aspects may also contribute to students' perceptions of overall service quality in the higher education sector. Several studies have identified varying numbers of primary dimensions and suggested the number of dimensions may vary depending on the service setting (Brady & Cronin, 2001; Chen, Lee, Chen, & Huang, 2011; Clemes et al., 2013; Dagger et al., 2007; Ko & Pastore, 2005; Wu & Cheng, 2013).

The second research gap relates to a lack of published research pertaining to the service quality primary dimensions (including social factors) that Chinese university students may perceive to be more or less important. Closing this research gap will enable China's HEIs to correctly resource the appropriate primary dimensions of higher education service quality that their students perceive as more or less important. Identifying the relative importance of the primary dimensions in a higher educational context will aid HEIs in their strategic planning process and assist them in correctly allocating resources to each dimension (Clemes et al., 2013; Clemes et al., 2008).

The third research gap relates to a lack of published empirical research that has developed and tested a comprehensive hierarchical model to investigate the interrelationships between higher order marketing constructs such as service quality, student satisfaction, student involvement, university image, and student loyalty in a Chinese higher educational context. To date, no previous study has included student involvement and student loyalty as higher-order constructs in the modelling framework. Moreover, none of the studies relating to China's higher education sector have tested the mediating impacts of student involvement on the relationships between service quality and student satisfaction, and service quality and university image. Nor has any study tested the mediating impact of student satisfaction on the relationship between service quality and student loyalty in China's higher education sector. Closing this research gap is important as several service marketing scholars advocate new studies into the interrelationships between the important service marketing constructs in different service settings to assist organizations in their strategic market planning and implementation (Clemes, Shu, & Gan, 2014; Clemes et al., 2013; Howat & Assaker, 2013; Lai, Griffin, & Babin, 2009).

The fourth research gap relates to a lack of studies that have conducted a multi-group analysis based on student samples drawn from China's higher education sector. In particular, measurement invariance and structural invariance within the framework of a higher education comprehensive hierarchical model have not been tested. To date, no study has tested for invariance across the different gender groups and the different years-of-study groups within China's higher education sector. Nor has any study tested if the individual paths in a higher education comprehensive hierarchical model are equivalent across different genders and different years-of-study (e.g. First Year and Third Year Students), or if the path coefficients vary between the student groups within China's higher education sector.

1.4 Research Objectives

This current research has two main goals. One is to gain a more thorough understanding of the primary dimensions that impact on university students' perceptions of service quality in China's higher education sector. The other is to empirically examine the interrelationships between the higher order constructs (service quality, student satisfaction, student involvement, university image, and student loyalty); including testing for the mediating effects of student involvement and student satisfaction in the path model and conducting multi-group analyses.

This study has four main objectives:

1. To identify the primary dimensions of service quality as perceived by university students in China's higher education sector.

2. To identify the least and the most important primary dimensions of service quality as perceived by university students in China's higher education sector.

3. To examine the interrelationships among service quality, student involvement, student satisfaction, university image, and student loyalty (including the mediating effect of student involvement and student satisfaction) in China's higher education sector.

4. To examine the perceptual differences of interrelationships among service quality, student satisfaction, student involvement, university image, and student loyalty between different genders (males and females) and different years-of-study (First Year and Third Year Students) using a multi-group analysis.

1.5 Contribution of This Research

This study will contribute to the service marketing literature from both a theoretical and practical perspective by satisfying the four research objectives.

Theoretical contributions

This study contributes to the services marketing literature by offering a more comprehensive and complex model of student loyalty in China's higher education sector. The theoretical model developed and tested in this study empirically tests the complex interrelationships between all five important marketing constructs (service quality, student satisfaction, student involvement, university image, and student loyalty) in a single framework, simultaneously using structural equation modelling. Previous studies on higher education have empirically examined the relationships among the higher order constructs using a series of multiple regression equations in multi-level models (Clemes et al., 2013; Clemes et al., 2008). This study also identifies the key drivers of student loyalty in a higher educational context from the perspective of a non-western country.

This current study identifies the role of student satisfaction in mediating the relationship between service quality and student loyalty in the higher educational context. In addition, the mediating impacts of student involvement on the relationship between service quality and student satisfaction, and the relationship between service quality and university image are tested in this study. The links between service quality and student loyalty, service quality and student satisfaction, and service quality and university image may not be straight forward ones and this highlights the importance of investigating these relationships in an educational setting.

The third theoretical contribution of this study is to provide an empirical analysis of the primary dimensions (including the social factors quality) that determine students' perceptions of higher

education service quality. Identifying and confirming the importance of social factors as a fourth primary dimension of the overall higher education service quality provides a framework for further studies on educational service quality.

Fourthly, to date, there is no published study which has tested the measurement invariance and structural invariance of a comprehensive hierarchical path model within a higher education contextual framework. Therefore, this study also contributes to the service marketing literature by conducting a multi-group analysis in order to investigate the perceptual differences of the higher order constructs (service quality, student satisfaction, student involvement, university image, and student loyalty) between different genders and different years-of-study (First Year and Third Year students).

Managerial contributions and implications

The theoretical research model developed and tested in this study has clarified the complex nature of the interrelationships between the five higher order constructs (service quality, student satisfaction, student involvement, university image, and student loyalty) in a higher educational context. Higher education marketers must identify the determinants of student loyalty since HEIs with loyal students are able to create a competitive advantage. The valuable information gained from the analyses of the interrelationships between the higher order constructs in this study will help the HEI practitioners to create marketing strategies to attract new students and increase the number of loyal students. The study composes a robust and valid measurement instrument that can be used by higher education marketers as a tool to evaluate higher education service quality in general.

Higher education marketers can use the information gained from the comprehensive hierarchical model as a platform for future cross cultural studies and multi-group analyses. For example, the model can be used by other HEIs in other countries as a framework for assessing their activities, or a multi-group analysis can be conducted to investigate students' perceptual differences of the higher order marketing constructs between different study majors or years.

The hierarchical view of service quality also enables higher education marketers to gain a clear understanding of how university students assess the quality of the higher education services. The information can be used to formulate higher education service quality improvement activities to encourage students engaged with the HEIs. Moreover, the modelling framework allows the higher education service quality construct to be assessed systematically. If problems occur that effect the overall level of higher education service quality, higher education marketers can pin point the problems by measuring their performance on the four primary dimensions of higher education

service quality confirmed in this study. Then, higher education marketers can narrow the problem area and facilitate solutions.

The modelling framework also identifies the least to most important primary dimensions impacting on students' perceptions of higher education service quality to aid resource allocation. For example, the current results illustrate that outcome quality and social factors quality are the main contributors to overall higher education service quality. Therefore, higher education marketers of the HEIs in the sample need to highlight and allocate more effort and resources to outcome quality and social factors quality since these two primary dimensions are more important to their students.

Notes

1. Project 211 was launched in 1995, with the goal of building up 100 top-level universities and key disciplines in the 21st century (Brandenburg & Zhu, 2007).

2. Project 985 was officially announced in May 1998, at the 100th anniversary ceremony of Beijing University. This project aims to develop 10 to 12 world-class universities (Brandenburg & Zhu, 2007).

Chapter 2

Literature Review

The following sections provide a review of the relevant literature regarding the constructs: student loyalty, student satisfaction, university image, student involvement, service quality, and the primary dimensions of higher education service quality, as well as the interrelationships among these constructs.

2.1 Customer / Student Loyalty

Customer loyalty is defined in the service marketing literature by Oliver (1997, p.392) as a *"deeply held commitment to rebuy or to repatronise a preferred product/service consistently in the future, thereby causing repetitive same-brand or same-brand set purchasing, despite situational influences and marketing efforts having the potential to cause switching behaviour"*. Berkman, Lindquist, and Sirgy (1997) identify customer loyalty as customers' feelings of attachment, affection, or commitment to a product/service provider. Lam, Shankar, Erramilli, and Murthy (2004) describe customer loyalty as an overall attachment or deep commitment of the customer to a product, service, brand or organization, while Kim, Park, and Jeong (2004) conceptualise it as a combination of buyers' favourable attitudes and repurchase behaviour.

In a service marketing context, Aydin and Özer (2005) suggest that the characteristics of customer loyalty are comprised of repurchase intention, a resistance to switching to a competitor's product/service, and a willingness to recommend to friends and associates. Word-of-mouth and repurchase intention are identified by Zeithaml, Berry, and Parasuraman (1996) as two forms of loyalty. Word-of-mouth refers to customers saying positive things about the company as well as their recommending the company to others, while repurchase intention refers to customers doing more business with the company and who consider the company as their first choice in the future. Ehigie (2006) proposes that the purpose of any company is to create and keep customers, as customers are the greatest asset to the company. Customer loyalty is suggested to be related to both company profitability (Duncan & Elliott, 2002) and company continuity and stability (Payne & Rickard, 1997). Therefore, customer loyalty is considered as a crucial factor for any company to gain long-term success (Kim & Kim, 2005; Suhartanto, Clemes, & Dean, 2013).

Although customer loyalty has divergent definitions, at least two basic approaches can be used to conceptualise it (Odin, Odin, & Valette-Florence, 2001). First, is Ehrenberg's (1988) stochastic approach, which is also called the behavioural approach by de Ruyter, Wetzels, and Bloemer (1998), in which customer loyalty is assumed to be a behaviour. Gremler and Brown (1996) consider de

Ruyter et al.'s (1998) the behavioural approach to be repeat purchasing behaviours. Second, is Fournier and Yao's (1997) deterministic approach, which is also called the attitudinal approach by Oliver (1999), in which customer loyalty is assumed to be an attitude. Oliver (1999) defines attitudinal approach as a liking or attitude of customers towards the product/service provider based on their satisfactory experience with products/services.

In addition, Oliver (1999) suggests four stages of loyalty (cognitive loyalty, affective loyalty, conative loyalty, and action loyalty) and states that these four stages of customer loyalty form in a consecution. Consumers reach different stages of customer loyalty based on the different levels of commitment that they develop toward a service provider. The later stages represent higher levels of consumers' commitment (Oliver, 1999). The first stage is cognitive loyalty that refers to consumers' attitudes toward a brand based on the information provided. The second stage is identified as affective loyalty that refers to consumers' attitudes or attachments toward a brand by cumulatively satisfying usage occasions. The third stage, conative loyalty, is achieved after repeated formation of positive feelings toward a brand. Consumers show a deep commitment to purchasing from a certain brand again in this stage. The fourth stage is action loyalty in which consumers show an additional desire to overcome possible obstacles for using a certain brand's products or services (Oliver, 1999).

In a higher education context, Student Loyalty is proposed to be positively related to an educational institution's ability to not only attract new students, but also retain existing ones (Dehghan, Dugger, Dobrzykowski, & Balazs, 2014; Dick & Basu, 1994; Helgesen & Nesset, 2007a; Henning-Thurau et al., 2001; Oliver, 1997). Kotler and Fox (1995) believe that retaining matriculated students is just as significant as attracting and enrolling them, especially under increased global competition among HEIs. The growing interest in Student Loyalty has resulted in the construct being a key objective for many higher education institutions and Student Loyalty has received increasing attention in the literature (e.g., Arnett, German, & Hunt, 2003; Bowden & D'Alessandro, 2011; Carvalho & de Pliveira Mota, 2010; Hennig-Thurau et al., 2001; Marzo-Navarro et al., 2005). A range of antecedents for predicting Student Loyalty have been identified in the literature: institutional reputation, facilities, social interaction (Helgesen, 2008; Helgesen & Nesset, 2007a), satisfaction (Ehigie & Taylor, 2009; Fornell, Mithas, Morgenson, & Krishon, 2006; Marzo-Navarro et al., 2005; Mavondo, Tsarenko, & Gabbott, 2004), perceived value (Bowden & D'Alessandro, 2011), service quality (Hennig-Thurau et al., 2001; Hill, 1995), trust (Carvalho & de Pliveira Mota, 2010), and image (Helgesen & Nesset, 2007a; Nguyen & Leblanc, 2001). Ehigie & Taylor (2009) argue that the behaviours used to describe Student Loyalty to the institution after graduation are different from the behaviours used to describe customer loyalty to a product/service. For example, such behaviours may like graduated students who own companies would like to provide internships and job-related information to current students.

Hennig-Thurau et al. (2001) identify that maintaining long-term relationships with students may reduce marketing costs, since keeping existing students is less cost-intensive than seeking new ones. Moreover, maintaining long-term relationships with students can provide some sort of strategic competitive advantage (Schlesinger et al., 2015). Student Loyalty may positively influence the teaching quality through a student's active participation and committed behaviour (Rodie & Kleine, 2000). Helgesen and Nesset (2007b) and Hennig-Thurau et al. (2001) note that the advantages of Student Loyalty are not restricted to students' attitudes and recommendations of the service during the time they are formally enrolled at the university. Indeed, these advantages are at their greatest level after students have completed a degree or course, as loyalty can extend to include attitudes and behaviours following graduation. Former students' loyalty can also be highly significant for the success of an institution. Student Loyalty should therefore refer to loyalty not only during the period as a registered student but also after a student's period of study at an educational institution.

Student Loyalty can encourage not only positive word-of-mouth recommendations but also student involvement and cooperation with the institution during and after the formal study years (Wilkins & Balakrishnan, 2013). Student Loyalty to the institution after graduation includes activities such as providing job-related information or internships for current students, assisting the institution to raise funds, attending alumni meetings, and sharing news about the institution (Ehigie & Taylor, 2009). Marzo-Navarro et al. (2005) note that Student Loyalty may bring several long-term benefits to the institution, for example, donations (financial support), some form of co-operation (e.g., giving visiting lectures), as well as positive word-of-mouth communications. Hennig-Thurau et al. (2001) suggest that retaining students can contribute solid financial support to a higher education institution, since loyal students may continue to support the institution after their graduation as well as to recommend the institution to their friends. Mavondo et al. (2004) also find that a high level of Student Loyalty may lead to repeat purchase in continuing education. Ehigie & Taylor (2009) suggest that loyal students spread positive information about the institution to prospective students and donors. Moreover, they help to promote the university image by engaging in related activities.

2.2 Customer / Student Satisfaction

Customer satisfaction has been defined in various ways, as *"an outcome of purchase and use resulting from the buyer's comparison of the rewards and costs of the purchase in relation to the anticipated consequences"* (Churchill & Surprenant, 1982, p.493). Hunt (1977, p.49) defines customer satisfaction with a product as *"the favourableness of the individual's subjective evaluation of the various outcomes and experiences associated with buying it or using it"*. Solomon (1994, p.346) defines the satisfaction concept as *"an overall feeling, or attitude, a person has about a product after it has been purchased"*. Oliver (1997) identifies customer satisfaction as the pleasurable fulfilment,

which means that customers perceive that *"consumption fulfils some need, desire, goal, or so forth and that this fulfilment is pleasurable. Thus, satisfaction is the consumer's sense that consumption provides outcomes against a standard of pleasure versus displeasure."* (Oliver, 1999, p. 34). As defined by Oliver (2010, p.8), *"satisfaction is the consumer's fulfilment response. It is a judgment that a product/service feature, or the product or service itself, provided (or is providing) a pleasurable level of consumption-related fulfilment, including levels of under- or overfulfilment".*

Based on the comparison of customers' experiences with their expectations, customer satisfaction may be perceived as *"a summary psychological state or a subjective summary judgment"* (Helgesen, 2008, p.57). Clemes et al. (2008) find that customer satisfaction is viewed as a summary of emotional and cognitive responses occurring after consumption, or after accumulative experiences that pertain to a particular focus (expectations, product/service, or consumption experience).Customer satisfaction is regarded by Rojas-Méndez et al. (2009) as a cumulative construct since it includes not only customer satisfaction with the specific products/services and also with other various aspects of the company; for example, the physical facilities of the company or the company's interaction with the employees.

In the context of higher education, Student Satisfaction is defined by Elliott & Shin (2002, p.198) as *"the favourability of student's subjective evaluation of the various outcomes and experiences associated with education"*. The definition of Student Satisfaction focuses not only on student accomplishments in their learning but also on student enjoyment with the experience. Moore (2009, p.74) defines Student Satisfaction as *"Students are successful in the learning experience and are pleased with their experience"*. Student Satisfaction is also defined as student perceptions of accomplishment and enjoyment in their learning (Sweeney & Ingram, 2001).

Elliott & Shin (2002) and Oliver & DeSarbo (1989) conceptualise Student Satisfaction as a short-term attitude that arises from a student's subjective assessment of the various educational experiences and outcomes in the higher education sector. Browne, Kaldenberg, Browne, & Brown (1998) conclude that a student's overall satisfaction with a university is shaped by a student's evaluation of the quality of the curriculum-related factors such as the course, while the extent of interaction between a student and the university staff heavily affects the likelihood of the student's recommending behaviour. In addition, Fraser (1994) finds that the match between student preferences and the classroom environment may relate to student satisfaction. Moreover, Student Satisfaction is found to be related to how well the campus environment matches student priorities (Borden, 1995). The campus environment is defined by Elliott and Shin (2002) as a web of interconnected experiences, which may overlap and influence a student's overall satisfaction with the university.

A number of factors that lead to higher Student Satisfaction are identified in the literature, including the University Image and value (Alves & Raposo, 2007), the learning environment (Beard & Harper, 2002), and interaction and communication (Cao, Griffing, & Bai, 2009; Parayitam, Desai, & Phelps, 2007; Wu, Tennyson, & Hsia, 2010; Wuensch, Azia, Kishore, & Tabrizi, 2008). García-Aracil's (2009) study examines several factors (for example, course content, equipment, teaching quality, the supply of teaching/learning materials) that influence higher education graduates' study satisfaction in eleven European countries. García-Aracil's (2009) findings show that the importance of the factors on Student Satisfaction was relatively stable across the eleven countries. Butt and Rehman's (2010) investigations show that there is a significant and positive relationship between Student Satisfaction and teachers' expertise, courses offered, learning environment and classroom facilities. The study of Sojkin, Bartkowiak, & Skuza (2012) identifies that social conditions and educational facilities are also key determinants of Student Satisfaction in higher education. However, student teaching and learning experiences are not the only determinants of Student Satisfaction as it is also students' overall experience as a customer of a particular institution that determines Student Satisfaction (Wilkins & Balakrishnan, 2013).

Sevier (1996) argues that the product of a university should be the sum of a student's academic, social, physical and spiritual experiences instead of just its academic program. Mansor, Hasanordin, Rashid, & Rashid (2012) suggest that the assessment of overall Student Satisfaction involves not only students' satisfaction of academic experiences but also their satisfaction of other aspects of the university environment, such as the social and physical environment, and the administrative processes. Mansor et al. (2012) also note that a university needs to realize that it should not only emphasize its academic programs but also emphasize other experiences in order to satisfy its students. Oliver (1980) suggests that students' overall experiences continually influence their satisfaction, while Elliott and Shin (2002) find that student satisfaction is being constantly shaped by students' repeated experiences of campus life. Seymour (1993) note that it is the combination of all experiences (academic experience, learning environment, campus life experience etc.) that affects the overall satisfaction of students with the institution.

Customer satisfaction is identified by Chen and Chen (2010) as one of the important antecedents of future consumer purchase behaviour, and has been found to have a very strong correlation with consumers' repurchase intentions (Patterson, Johnson, & Spreng, 1997), as well as future patronage intentions (Babin & Griffin, 1998). Hence, in the higher education sector, the degree of Student Satisfaction with the educational experience may affect students' positive future behavioural intentions. Furthermore, Student Satisfaction has been found to have a positive relationship with Student Loyalty (Helgesen & Nesset, 2007a; Helgesen & Nesset, 2007b; Schertezer & Schertezer, 2004). Research findings reveal that achieving Student Satisfaction can benefit HEIs in several ways,

since satisfied students are less likely to drop out (Tinto, 1993), more likely to engage in positive word-of-mouth communication to others, more likely to return to the institution to take other courses, and more likely to collaborate with the institution after graduation (Alves & Raposo, 2009; Helgesen & Nesset, 2007b; Mavondo et al., 2004). Elliott and Shin (2002) believe that it is imperative for universities to identify and meet students' needs and expectations in order to gain a competitive advantage, as well as to better attract and retain quality students. It is critical for HEIs to learn whether students are satisfied with their experience in campus as well as to continue to find ways to increase Student Satisfaction (Elliott and Shin, 2002).

2.3 Image / University image

Image is defined by Barich and Kotler (1991) as the sum of beliefs, attitudes and impressions that a person or group holds towards an organization, product, or brand. Andreassen and Lindestad (1998) propose that customers' perceptions of image are built by a person's knowledge systems that arise from ideas, feelings and previous experiences retrieved from the person's memory. Corporate image refers to various groups of external stakeholders' perceptions of an organization, and is defined by Chun (2005) as a summary of the external stakeholders' perceptions or impressions of an organization. There are two distinguishing principal components of image: the functional component – which is related to tangible characteristics and can be easily measured; and the emotional component – which is associated with psychological dimensions that can be demonstrated by feelings and attitudes towards an organization (Kennedy, 1997). From the perspective of Mazursky and Jacoby (1986), functional components refer to store layout and the range of prices and goods, while emotional components refer to customers' senses of belonging and their consciousness of their experience as good or bad.

Increasing attention has been paid to the significance of image in the service marketing literature, and the impact of an organization's image on customers' perceptions and behaviours, especially on customer satisfaction and customer loyalty (Alves & Raposo, 2010; Andreassen & Lindestad, 1998; Grönroos, 1984). An organization's image is created so as to convince outsiders about the specific and desirable characteristics of the organization (Pampaloni, 2010). Sung and Yang (2008) believe that it is extremely important for an organization to create a good image, particularly when customers have had minimal direct experience with the organization. Pampaloni (2010) argues that customer perceptions of an organization's image have a direct impact on future contact with the organization.

A higher education institution's (HEI) image is defined by Kotler and Fox (1995, p.231) as *"the sum of beliefs, ideas, and impressions"* that both current students and prospective students have of the university. Assessing university image can help an institution to learn about which strengths it should

emphasize and what information it should communicate to the public (Alves & Raposo, 2010). Nguyen and LeBlanc (2001) believe that a HEI's image is related to how the institution conveys its physical and behavioural attributes (such as the university name, its architecture, the variety of services, its ideology), as well as the impression of its quality that the public perceives. A study by Palacio, Meneses, and Pérez (2002) on University Image supports Kennedy's (1977) perspectives of image and proves that a university's image is formed by the cognitive and affective components. The study of Palacio et al. (2002) also demonstrates that the cognitive component of University Image has an impact on the affective component of its image, while the affective component is more influential on global image-building. Accordingly, University Image is regarded as students' perceptual views of the institution, influenced by: tangible elements, intangible elements, communication, personal values, and social values (Palacio et al., 2002).

Huddleston and Karr (1982) note that a student often perceives an institution across a number of components, including: academic reputation, campus appearance, study costs, and graduate and professional preparation. Kazoleas, Kim, and Moffit (2001) view organizational infrastructure is the most basic and important factor for image. In addition, personal connections and environmental factors are also critical for image. Arpane, Raney, and Zivnuska (2003) identify three stable factors that influence university image: academic attributes, athletic attributes, and new media coverage. Alves and Raposo (2010) show that an institution can have a better understanding of its university image through surveying its current students, alumni and the local community.

Moreover, a HEI's image is identified to be the result of an aggregate process since it is updated each time various attributes of institutions are compared and contrasted by the public. Different groups, such as students and academic staff, may possess various images of a university since they have different experiences and contacts with the university. Hence, the indicators of a HEI's image are gained from individual experiences, as well as from the processing of information about the attributes (Nguyen & LeBlanc, 2001).

Ivy (2001) argues that University Image is not absolute, but relative to the images transmitted by other institutions, and how the public perceives the strategies used by HEIs. HEIs should not only understand the image that they portray, but also make sure that they convey an image that is an accurate and favourable indication of their institutions. People form images of HEIs based on limited and sometimes even inaccurate information and images may affect the likelihood of people attending or recommending the institution (Kotler & Fox, 1995). A HEI's overall image is drawn from the impressions that the public have about the strengths and weaknesses of the offerings of the HEI. Past experiences, word of mouth critiques, and marketing activities of the HEI all help to form these images (Ivy, 2001). Furthermore, several studies have demonstrated that there is a positive

relationship between University Image and Student Satisfaction (Clemes et al., 2013; Alves & Raposo, 2010; Kuo & Ye, 2009; Clemes et al., 2008). Moreover, image building is essential for HEIs to attract and retain students, since University Image is an important driver of Student Loyalty (Sevier, 1994; Bush, Ferrell, & Thomas Jr, 1998; Standifird, 2005).

2.4 Student Involvement

Moore, Lovell, McGann, and Wyrick (1998) review the literature on the importance of Student Involvement, and find that Student Involvement positively influences student college experience, as well as student development. Hernandez, Hogan, Hathaway, and Lovell (1999) review the literature to clarify the definition of Student Involvement and student development. Hernandez et al. (1999) also suggest that studies on athletics, Greek organizations, general activities and organizations, on-campus living, out of class involvement with faculty, peer interaction, and employment has supported a positive impact of Student Involvement on student development and student learning. In addition, several researchers discuss the importance of Student Involvement to assess student college experiences in general (Astin, 1999; Moore et al., 1998; Pascarella & Terenzini, 1991) and African American college student experiences in particular (Flowers, 2004; Outealt & Skewes-Cox, 2002).

However, only a few studies have described the relationship between Student Involvement and Student Satisfaction (Astin, 1999) or linked Student Involvement with Student Satisfaction (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008). To date, no studies have empirically examined the relationships between Student Involvement and the other higher order marketing constructs such as Service Quality, Student Loyalty and University Image. In addition, studies in the service marketing literature that investigate the mediating effect of student involvement on the relationships between Service Quality and Student Satisfaction, and Service Quality and University Image, especially in the higher education sector in China are sparse.

Involvement can be interpreted differently depending on the view of the researchers since involvement conceptually overlaps with the related concept of engagement in the marketing / higher education literature. Researchers often interchange Student Involvement with student engagement (Astin, 1984; Astin, 1999; Berger & Milem 1999; Kuh, 2001; Sharkness & DeAngelo, 2011; Tinto, 1993). The literature relating to both Student Involvement and student engagement is discussed in the following sections.

Hu, Ching, and Chao (2012) note that student engagement can be defined as student involvement or student commitment based on a broad definition of engagement. Student Involvement theory by Astin (1985) explains that students learn by the concept of being involved. Further Keedy and

Drmacich's (1991) research illustrates that student participation in class and curriculum planning, classroom management, and other pedagogical involved tasks are considered as student engagement. Chapman (2003) describes student engagement as a student's willingness to participate in routine school activities, which include attending class, following class instructions, and submitting assignments. In the educational psychology area, Fredricks, Blumenfeld, and Paris (2004) note that student engagement comprises students' willingness to master particular skills, students' reactions to the teacher, and students' participation in intracurricular and extracurricular activities. Moreover, student engagement is defined by Bulger, Mayer, Almeroth, and Blau (2008) in terms of interest, effort, motivation, and the time the student spends on a particular learning task. Student activity, involvement and effort in the learning tasks are also suggested to positively relate to student academic achievement (Hu et al., 2012).

Student engagement is proposed to be the quality of effort that students devote to educational activities, which is linked to desirable educational outcomes directly (Krause & Coates, 2008). Similarly, Kuh et al. (2008) identify student engagement as the degree and quality to which learners are engaged with their educational activities, which positively contribute to higher grades, student satisfaction, and perseverance. Therefore, Kuh (2009) recommends that if students spend more quality time on studying a subject, they will know more about the subject. In addition, if students interact more with faculties about their studies, then they are more likely to improve their learning ability. As shown in several research studies, the more that students are participate in campus activities, the more they normally consider themselves as a part of campus life. Students who have higher student involvement are also more likely to have positive outcomes such as cognitive gains, satisfaction, and retention (Astin 1993; Berger & Milem, 1999; Kuh, 2001; Kuh et al., 2008; Tinto 1993). Dunleavy and Milton (2009) place much interest in the impact of campus climate on student's experience of engagement. Students who have higher student involvement are more likely to become active participants, and experience deeper engagement with learning, enhanced relationships with lecturers, and increased commitment (Dunleavy & Milton, 2009).

Astin (1984, p.297) identifies Student Involvement as a complex concept and defines Student Involvement as *"the amount of physical and psychological energy that the student devotes to the academic experience"*. Student Involvement refers to both the quantity and quality of the physical and psychological energy that students invest in their college experiences. Therefore, those students who are highly involved devote more time and energy to studying, spend more time on campus, use facilities such as the library, computer labs, or recreation facilities more frequently, participate more actively in student organizations, sports/recreational programs and extra-curricular activities, and interact more frequently with faculty members or other students than those uninvolved students (Astin, 1999).

Student engagement is clarified to be multidimensional by nature (Ainley, 1993; Martin & Dowson, 2009). However, the dimensions identified are different depending on the study in terms of the different ways of understanding student engagement in the literature. These dimensions include behavioural engagement, emotional engagement, and cognitive engagement (Dunleavy & Milton, 2009; Fredricks et al., 2004). Fredricks et al. (2004) suggest that the concept of behavioural engagement comes from the idea of participation. Dunleavy and Milton (2009) suggest that students who participate in academic and social or co-curricular activities, attend actively, and complete assignments are much more likely to achieve positive academic outcomes. In addition, behaviour engagement also contains a student's ability to follow class rules and directions, come to class on time, and avoid unnecessary negative behaviours (Finn & Rock, 1997).

This current study focuses on a single dimension of student engagement instead of relying on a combination of these dimensions. Involvement implies a behavioural component, while the behavioural aspects of involvement are more critical than the motivational aspect of construct (Astin, 1999). Thus, Astin (1999) emphasizes that it is what individuals do and how they behave that defines and identifies involvement, instead of what individuals think or feel. The theory suggests that student time is the most precious institutional resource, since how the students can achieve particular developmental goals is directly related to the time and effort they devote. Moreover, Student Involvement takes many different forms, such as place of residence (living on campus), absorption in academic work, interaction with faculty and peers, participation in honours programmes, extracurricular activities or student government (Astin, 1999), and on-campus employment (Hernandez et al., 1999).

Astin (1999) and Hernandez et al. (1999) explain that students who live on campus (residents) are more likely to participate in extra-curricular activities or student organizations, than commuters. Hence, they are also more likely to express satisfaction with their undergraduate experiences, especially in the areas of social life, university image, and relationships with faculty/other students. Similarly, participating in honours programmes is suggested to have a positive relationship with student satisfaction. Overall, being deeply academically involved strongly relates to student satisfaction with all of their institutional experiences, apart from student friendships. Frequent interaction with faculty is also suggested to strongly relate to student satisfaction with the institution (Astin, 1999; Hernandez et al., 1999). Furthermore, Mavondo et al. (2004) suggest that in the higher education sector, the degree of involvement of the students may be critical to their overall satisfaction.

2.5 Conceptualisations of Service Quality

Service quality was described by Parasuraman, Zeithaml, & Berry (1985) as an abstract and elusive construct, and the authors noted that there were at least three unique characteristics of services when compared to physical goods: intangibility, heterogeneity, and the inseparability of production and consumption. Zeithaml et al. (1996) and Parasuraman et al. (1985) also suggested that delivering a quality service was a vital strategy for any business organization to succeed in competitive market conditions. Grönroos (1982) defined perceived service quality as a form of attitude, which results from a comparison of expectations of performance with perceptions of actual performance. Further, Parasuraman et al. (1985) noted that perceived service quality relates to satisfaction but is not equivalent to it. Similarly, Cronin and Taylor (1992) supported the notion that service quality is best conceptualised and measured as an attitude. Service Quality is defined concisely by Zeithaml and Parasuraman (2004, p.1) as *"the differences between customers' expectation of service and their perceptions of actual service performance".*

However, Brady and Cronin (2001) claim that there is a lack of consensus, not only on the conceptualisation and measurement of Service Quality, but also on its dimensions and the content of the dimensions. Numerous Service Quality studies have been dedicated to defining Service Quality, as well as developing measures of Service Quality (See: Brady and Cronin, 2001; Kang & James, 2004; Kang, 2006; Ladhari, 2008; Tam, 2004). Quality is one of the many concepts that is deemed to be difficult to define in an education context. Defining quality may be even more difficult in a higher education context than it is for most other industries (Lagrosen, Seyyed-Hashemi, & Leitner, 2004). Five discrete but interrelated definitions were proposed by Harvey and Green (1993) for discussing quality in higher education: where quality is viewed as exceptional (in terms of excellence), perfection or consistency, fitness for purpose (meeting customer requirements), value of money, and transformation (taking the form of enhancement and empowerment).

Lagrosen et al. (2004) empirically examine the dimensions of quality in a higher education context from the perspectives of students. The findings of Lagrosen et al.'s (2004) study provide a valuable development of some of the earlier research into quality in higher education. In addition, Lagrosen et al. (2004) highlight the value of identifying specific quality dimensions for the higher education sector, since they find a reasonable correspondence but also several differences between their study and general research into service quality. Mai (2005) identifies two approaches that can be used to assess education quality: mechanistic and humanistic. The mechanistic approach is often conducted by experts and agencies during exercises such as the Quality Assurance Assessment or the Research Assessment, while the humanistic approach places the emphasis on the views of the students (Mai, 2005).

In the previous service marketing literature, researchers generally have adopted two types of conceptualisations of Service Quality (Brady & Cronin, 2001). Grönroos's (1984) "Nordic" perspective defines functional (or process) quality and technical (or outcome) quality as the two dimensions that influence customers' overall perceptions of service quality. The second one is Parasuraman et al.'s (1988, 1985) "American" perspective, which adopts terms that indicate the characteristics of service encounters, such as reliability, responsiveness, empathy, assurances, and tangibles. The "American" perspective adopts Grönroos's (1984) conceptualisation of Service Quality and they also view perceived service quality as a gap between perceptions and expectations of customers towards service performance. However, Brady and Cronin (2001) argue that though the "American" perspective dominates the literature, neither approach has been found to be the most appropriate one to conceptualise service quality.

2.6 Service Quality Models

2.6.1 The Perceived Service Quality Model

The Nordic Model developed by Grönroos in 1984 is based on the disconfirmation paradigm. Perceived service quality is considered as the outcome of an evaluation process, where perceived service is compared with the expected service. Technical quality and functional quality are identified by Grönroos (1984) as two dimensions of perceived service quality, while corporate image is viewed as a third quality dimension in the original Nordic Model. Grönroos (1984) identified corporate image as the result of how customers perceive the organization. Corporate image is established mainly by the technical quality and the functional quality of the organization's services.

Technical quality and functional quality are relatively different in nature, since technical quality defines what the customer gets, whereas functional quality defines how the customer gets it. Moreover, the perceptions of the functional quality dimension are often subjective, while the technical dimension can be evaluated objectively (Grönroos, 1984). Grönroos (1984) points out that corporate image has an impact on customer expectations and as it is the result of how a firm is perceived by customers. Service quality is seen and perceived as the most critical part of a firm by the customers. Consequently, corporate image can be established chiefly by the technical quality and the functional quality of a firm's services. Grönroos (2001) also argues that image as a filter in terms of customer perceptions of quality.

2.6.2 The Gaps Model

Since little prior research has been done on quality in service area, the Gaps model of service quality model was developed in order to provide a conceptual framework as well as to serve as a basis for further empirical research on service quality (Parasuraman et al., 1985). Parasuraman et al. (1985)

also developed a service quality measurement instrument they named SERVQUAL. Parasuraman et al. (1985) originally proposed that ten evaluative dimensions (access, communication, competence, courtesy, credibility, reliability, responsiveness, security, tangibles and understanding/knowing the customer) were used by customers to form expectations and perceptions of services (Parasuraman et al., 1985). Overall perceived service quality was determined by the customer's comparisons of expected performance with the perceived performance on the ten dimensions of service quality. Parasuraman et al. (1988) refined the original ten dimensions of service quality to five: tangibles, reliability, responsiveness, assurance, and empathy. Parasuraman et al. (1988) refined the original ten dimensions of service quality because levels of overlap occurred among some of the original ten dimensions as discussed in the Parasuraman et al.'s (1985) study.

2.6.3 The Three-Component Model

A Three-Component Model of conceptualised service quality was proposed by Rust and Oliver (1994) as an expanded version of Grönroos's (1984) Nordic Model. Rust and Oliver (1994) note that effectively managing service quality requires not only understanding customer satisfaction, service quality, and customer value, but also understanding three main elements. Rust and Oliver's (1994) model consists of three main elements of service quality: the service product (technical quality of the service), the service environment, and the service delivery (functional quality of the service). The service product is suggested to be the outcome and the customers' perceptions of the service performance, while the service delivery refers to the consumption process and any relevant events that occur during the service act. The service environment is comprised of the internal environment and the external environment (Rust & Oliver, 1994). Bitner (1992) also emphasized the importance of the service environment because of its integral role in forming customer perceptions of service quality. Although Rust and Oliver (1994) did not empirically test their conceptualisation in their study, subsequent studies by McDougall and Levesque (1994) in the retail banking industry and McAlexander et al. (1994) in the health-care industry, provided support for three primary dimensions of service quality that were very similar to Rust and Oliver's (1994).

2.6.4 The Dabholkar et al.'s (1996) Multilevel Model

A Multilevel Model is identified and tested by Dabholkar et al. (1996) to measure service quality in the retail industry. The model is developed with the belief that the customers' perceptions of service quality are not just multidimensional but also multilevel (Dabholkar et al., 1996). The findings of Dabholkar et al.'s (1996) study confirm that service quality needs to be evaluated at several levels.

Dabholkar et al. (1996) reveal that customers' perceptions of retail service quality are assessed at three ordered and hierarchical levels. Dabholkar et al. (1996) note that the overall level includes the

highest order factor which is the customers' overall perception of retail service quality. The primary dimensional level consists of five primary dimensions that lead to the overall level of service quality - physical aspects, reliability, personal interaction, problem-solving, and policy. The sub-dimensional level is composed of six sub-dimensions that contribute to the primary dimensions – appearance, convenience, promise, doing it right, inspiring confidence, and being courteous and helpful (Dabholkar et al., 1996).

2.6.5 The Integrated Hierarchical Model

Brady and Cronin (2001) adopt the view that customers' evaluate three dimensions (Interaction Quality, Physical Environment Quality, and Outcome Quality) of the service encounter to form their overall perceptions of service quality. Brady and Cronin (2001) also adopt the view of Dabholkar et al. (1996) that the customers' perceptions of service quality are multilevel and multidimensional. An integrated hierarchical model is proposed by Brady and Cronin (2001) as an extension of Rust and Oliver's (1994) Three-Component Model.

Brady and Cronin (2001) conducted a survey using samples taken from four service industries: fast food, photograph developing, amusement parks, and dry cleaning, in order to demonstrate empirical support for their integrated hierarchical model. The statistical analysis demonstrates that customers evaluate three primary dimensions (Interaction Quality, Physical Environment Quality, and Outcome Quality) to form their perceptions of service quality. The qualitative and empirical results of Brady and Cronin (2001) study indicate that the three primary dimensions are composed of nine distinct sub-dimensions. Moreover, customers base their evaluation of each primary dimension on their assessment of three corresponding sub-dimensions: attitude, behaviour, and expertise for Interaction Quality; ambience, design, and social factors for Physical Quality; and waiting time, tangibles, and valence for Outcome Quality. Brady and Cronin (2001) further reposition the reliability, responsiveness, and empathy dimensions of SERVQUAL as modifiers of the sub-dimensions in the model. The combination of the three primary dimensions and the nine sub-dimensions, in turn, constitutes the customers' overall perceptions of service quality. Furthermore, support for the integrated hierarchical framework by Brady and Cronin (2001) has been found in many different service industries, in studies that reported by Dagger et al. (2007) in the health-care industry, by Clemes et al. (2008) and Clemes et al. (2013) in the higher education industry, by Clemes, Brush, et al. (2011) in the sports industry, and Clemes, Shu, et al. (2014) in the mobile communication industry.

2.6.6 A Hierarchical Model in the Higher Education Sector

Clemes et al. (2008) suggest that a hierarchical factor structure may also be appropriate for assessing students' perceptions of service quality in a higher education context, since not only the students' perceptions of university experiences are multidimensional, but also the factors measured are almost alike to the factors identified in the integrated hierarchical model by Brady and Cronin (2001). Therefore, a higher education hierarchical model is proposed by Clemes et al. (2008) to provide an empirical insight into service quality, satisfaction, and behavioural intentions in the higher education sector. In particular, Clemes et al.'s (2008) study identifies three primary dimensions (Interaction Quality, Physical Environment Quality, and Outcome Quality) and ten sub-dimensions of service quality as perceived by students in a New Zealand university. Clemes et al. (2008) also examine the relationships between students' overall satisfaction with influential factors such as price and image. The study analyses the interrelationships between the dimensions of service quality, satisfaction, price, image, and favourable future behavioural intentions. The results of Clemes et al. (2008) study indicate that service quality has the greatest effect on satisfaction, while perceptions of price have an insignificant relationship with satisfaction. The results also indicate that university image has a minor effect on satisfaction. Clemes et al. (2008) also identify the positive effect service quality has on satisfaction, as well as the positive relationships between service quality and price, and service quality and image.

Teeroovengadum, Kamalanabhan, and Seebaluck (2016) develop and test a hierarchical model (HESQUAL) for measuring service quality in higher education in Mauritius. In particular, Teeroovengadum et al. (2016) use exploratory factor analysis to identify five primary dimensions (Administrative Quality, Support Facilities Quality, Core Educational Quality, Transformative Quality, and Physical Environment Quality) and nine sub-dimensions of service quality as perceived by students in a Mauritius university. However, the primary and sub-dimensions are not confirmed using confirmatory factor analysis in Teeroovengadum et al.'s (2016) study.

2.6.7 A Multi-Level Model in China's Higher Education Sector

Clemes et al. (2013) use multiple regression to synthesize behavioural intentions, satisfaction, service quality, perceived value and university image in one Chinese HEI. A multi-level model is developed by Clemes et al. (2013) to conceptualise and measure the perceptions of perceived service quality and to examine the interrelationships between Chinese students' behavioural intentions, satisfaction, service quality, perceived value, and university image. The results of Clemes et al.'s (2013) research indicates that service quality is an important determinant of university image and perceived value, while satisfaction significantly influences recommendation and future attendance. Service quality and university image are found as two key constructs contributing to satisfaction. Moreover, this

study confirms a significant moderating effect of perceived value on the relationship between service quality and satisfaction (Clemes et al., 2013).

Clemes et al.'s (2013) study not only provides empirical support for a multi-level approach in the conceptualisation and measurement of service quality, but also provides a framework for examining the interrelationships among service quality and several important constructs in China's higher education sector.

2.7 Primary Dimensions of Service Quality in Higher Education Institutions

A multidimensional and hierarchical model based on Brady and Cronin (2001) and Dabholkar et al. (1996) framework, is developed and empirically tested in this current study, to conceptualise and measure the perceptions of Chinese university students of higher education service quality. The research model suggests that Chinese university students evaluate higher education service quality at an overall level and at a primary dimensional level. The following sections provide a review of the service marketing literature that relates to the primary dimensions of higher education service quality.

2.7.1 Interaction Quality

Brady and Cronin (2001) find that the interpersonal interactions between a customer and an employee that take place during service delivery, have the greatest effect on the customer's perceptions of service quality. Hartline and Ferrell (1996) suggest that the attitudes and behaviours of customer-contact employees can have a positive or negative impact on customers' judgments of service quality. Higher education institutions are identified by Lovelock (1981) as 'people processing' services where personal contacts and interactions are highly involved. Interpersonal interactions that occur in a university involve students' interacting with their lecturers and faculty administrators. The service marketing literature suggests that the interpersonal interactions between higher education institutions and their students have an important impact on students' perceptions of higher education service quality (Clemes et al., 2013; Clemes et al., 2008; Jain, Sinha, & Sahney, 2011; Ling, Chai, & Piew, 2010; Mai, 2005). For example, Clemes et al.'s (2008) findings reveal that academic staff, administration staff, academic staff availability, and course content positively influence students' perceptions of interaction quality in a higher education institution.

2.7.2 Physical Environment Quality

Even though the nature of services is intangible, Bitner (1992) finds that the surrounding physical environment, where the service delivery processes take place, has a significant influence on service quality as perceived by customers. The physical aspects of a service are suggested to be similar to the

tangible dimension of SERVQUAL but with a broader meaning (Dabbolkar et al., 1996). Customers infer Physical Environment Quality based on their perceptions of the physical facilities. Hence, the Physical Environment Quality has a significant impact on perceptions of service quality (Brady & Cronin, 2001).

A positive relationship has been found, between students' perceptions of the physical environment and overall perceived service quality in a higher education context (Clemes et al., 2013; Clemes et al., 2008; LeBlanc & Nguyen, 1997). For example, the findings of Clemes et al. (2013) and Clemes et al. (2008) reveal that the university environment, such as the physical facilities, the physical appeal, the university accommodation, and the library, have a significant and positive influence on students' overall perceptions of higher education Physical Environment Quality.

2.7.3 Outcome Quality

The Outcome Quality dimension is represented by technical quality in Grönroos's (1984) conceptualisation of service quality, or *"what the customer is left with when the production process is finished"* (Grönroos, 1984, p.38). Fassnacht and Koese (2006) identify Outcome Quality as what the customer actually gets after the service delivery process. Rust and Oliver (1994) note that outcome quality represents what customers gained from the service and whether the customers' needs were fulfilled by the outcome of the service process. The literature suggests that there is a consensus that Outcome Quality, as perceived by customers, significantly affects customers' perceptions of service quality (Brady & Cronin, 2001; Rust & Oliver, 1994; Grönroos, 1984).

In the service marketing literature, customers measure Outcome Quality based on the tangible evidence, such as the waiting time associated with service delivery and the valence (Brady & Cronin, 2001). In a higher educational context, students measure Outcome Quality on development related factors (Clemes et al., 2013; Clemes et al., 2008). For example, the findings of Clemes et al. (2013) shows that Outcome Quality, such as whether the higher education institution provides good personal development and academic development for students, has a significant and positive impact on students' overall perceptions of higher education service quality.

2.7.4 Social Factors Quality

In this current study, Social Factors Quality is added to the original three primary dimensions of service quality (Brady & Cronin, 2001) as the fourth primary dimension. Support for adding Social Factors Quality is found in Yin and Lei's (2007) study describing campus involvement (engaging in campus activities/ campus clubs or organizations) conducted in a university in the United States. Baird (1990) suggests that in colleges in the United States it is common for students to be involved in student clubs and organizations, although most of students are primarily involved in their study. A

wide variety of campus activities and events are offered by almost all universities and colleges in the United States in order to provide outside classroom learning experiences to students, as well as to encourage students' social and recreational interactions within the higher education sector (Campus Activities and Events, 2006). Similarly, virtually majority of universities in China also offer various extra-curricular activities to students so as to enrich their social lives while in university.

There is also a positive and linear correlation between academic life and campus involvement (Austin, 1984; Austin, 1999; Moore et al., 1998). Moore et al. (1998) suggest that students should be highly involved in both academic life and extra-curricular activities so as to maximize their cognitive and affective growth. Those university students who are involved more in the academic and social aspects of campus life, may benefit more in terms of both learning and personal development (Yin & Lei, 2007). Research also shows that student achievement can be promoted by student clubs and organizations and extra-curricular activities, and the general satisfaction with academic experience can also be increased (Clubs and Organisations, 2006; Campus Activities and Events, 2006). Taking part in social activities helps to build more positive relationships between university students and the institution, by encouraging the social interactions of students (Yin & Lei, 2007).

Huang & Chang (2004) suggest that participating in student clubs and organizations is common in the HEIs, since these out-of-class activities also play an important role in students' university experiences. In addition, recreational activities have been noted as one of the important determinants of students' perceptions of HEI service quality. (Athiyaman, 1997; Ford, Joseph, & Joseph, 1999; Joseph et al., 2005). Joseph et al. (2005) suggest that the opportunity for students to participate in a variety of sports and student organizations, explains the number of recreational activities offered by a HEI, and these types of activities can also be regarded as extra-curricular activities.

In this study, Social Factors Quality is identified as students' overall perceptions of their social experiences in a higher education institution based on the extra-curricular activities, social activities and social practice activities offered by the institution. Researches have measured students' perceptions of social factors (Clemes et al., 2013; Clemes et al., 2008). However, there is one important limitation of the previous studies as researchers included the social factors of service quality in the physical environment quality primary dimension (Clemes et al., 2013; Clemes et al., 2008). The authors did not include social factors as a primary dimension with pertaining sub-dimensions.

2.8 The Relationships between Higher Order Constructs

The following sections discuss the interrelationships among the higher order constructs of Student Loyalty, Student Satisfaction, University Image, Student Involvement, and Service Quality.

2.8.1 The Interrelationships between Service Quality, Student Satisfaction, and Student Loyalty

Service Quality and Satisfaction have been identified as highly interrelated concepts (Spreng & Mackoy, 1996). González, Comesaña, & Brea (2007) note that there is confusion arising from the similarity of the definitions of Service Quality and Satisfaction, since both Service Quality and Satisfaction are based on the paradigm of disconfirmation of expectations (Parasuraman et al., 1988; Ladhari, 2008). However, Zeithaml, Berry, and Parasuraman (1993) argued that service quality and satisfaction could be distinguished in terms of the different standards of comparison represented by the two constructs. Perceived service quality is defined as a result of the disconfirmation of a desired service (which reflects what customers want) and/or an adequate service (which is the standard that customers are willing to accept). Moreover, the distinction between Service Quality and Satisfaction is explained by González et al. (2007). Satisfaction refers to individual or global transactions, whereas Service Quality is the general impression of services or an attitude towards service.

González et al. (2007) note that the presumed causal relationship between Service Quality and Satisfaction remains unsolved, since there are two opposite views over the relationship between customer satisfaction and Service Quality existing in the service marketing literature (Cronin & Taylor, 1992). One view suggests that a high level of perceived service quality results from a high level of customer satisfaction (Bolton & Drew, 1991; Bitner, 1990). The other view suggests that a high level of perceived service quality leads to a high level of customer satisfaction. The latter view is more accepted by the researchers (Clemes et al., 2013; Clemes et al., 2008; Dagger et al., 2007; Helgesen & Nesset, 2007b; Fornell et al., 1996; Parasuraman et al., 1994; Cronin & Taylor, 1992).

Fornell (1992) identifies customer satisfaction as the primary determinant of loyalty, and many other studies identify customer satisfaction as a predictor of loyalty (Lin & Wang, 2006; Chan, Hui, Lo, Tse, Tso, & Wu, 2003; Cronin et al., 2000; Fornell et al., 1996).

Customer satisfaction has also been found by Caruana (2002) to fully mediate the effect of Service Quality on Service Loyalty. Qin and Prybutok (2008) report that Service Quality and Satisfaction link directly to behavioural intentions. However, the authors determine that Satisfaction is not a mediator in the relationship between Service Quality and behavioural intentions. Olorunniwo, Hsu, & Udo (2006) note that the indirect effect of Service Quality (via satisfaction) on behavioural intentions is stronger than its direct effect on behavioural intentions. The findings of Dado et al.'s (2012) study

indicate that both Service Quality and customer satisfaction are important determinants of students' behavioural intentions, whereas Satisfaction has a stronger impact on behavioural intentions than Service Quality.

Zeithaml et al. (1996) demonstrate the positive impact of Service Quality on customers' behavioural intentions. In the Korean mobile communications market, the findings of Kim, Suh, and Hwang 's (2003) study show a positive impact of customer satisfaction on customer loyalty. Lai et al.'s (2009) empirical research on the Chinese mobile communications market illustrates that customer satisfaction is positively related to customer loyalty. The study by Boulding, Kalra, Staelin, & Zeithaml (1993) on US university students identifies that there are strong links existing between Service Quality and favourable future behavioural intentions. In a later empirical study of Australian university student experiences, Service Quality and Satisfaction were confirmed to relate equally well to favourable future behavioural intentions (Athyiaman, 1997).

Minami and Dawson (2008) emphasize the importance of understanding students' behavioural intentions since loyal students contribute to the profitability of a university. Jiewanto, Caroline, & Liza (2012) believe that Student Loyalty intentions are formed by word-of-mouth (WOM) intention and the behavioural intention. In the service marketing context, customers who display higher levels of satisfaction often have a higher usage level of a product/service (Bolton & Lemon, 1999; Ram & Jung, 1991), a stronger repurchase intention (Patterson et al., 1997), and a higher level of willingness to recommend the product/service to others, and to pay price premiums (Zeithaml et al., 1996; Fornell, 1992). In a higher education context, Temizer and Turkyilmaz (2012) find that Student Satisfaction is a significant determinant of positive WOM, student retention, and loyalty. Achieving high levels of Student Satisfaction and Student Loyalty have become a critical aim of all higher education institutions. Moreover, Student Satisfaction and Student Loyalty are strongly inter-related in the higher education sector (Koni, Zainal, & Ibrahim, 2013).

In a higher education context, academics have found Student Satisfaction to be positively related to Student Loyalty (Helgesen and Nesset, 2009; Schertzer and Schertzer, 2004; Athiyaman, 1997). Student Satisfaction is proposed to positively influence Student Loyalty in two ways: by positive recommendations and by future attendance (Clemes et al., 2013; Clemes et al., 2008; Endres, Chowdhury, Frye, & Hurtubs, 2009; Marzo-Navarro et al., 2005; Mavondo et al., 2004; Hennig-Thurau et al., 2001). When students are satisfied with a HEI's service quality, it is more likely that they will recommend the university to other prospective students (Clemes et al., 2013), and they will continue their education at the institution (Helgesen & Nesset, 2007a; Al-Alak, 2006).

However, Bowden and D'Alessandro's (2011) findings in their interactive classroom response technologies study, indicate that Student Satisfaction alone is not an important factor in determining

Student Loyalty in both technology and non-technology conditions. The authors suggest that Student Satisfaction may operate only as a minimum requirement for loyalty, which is contrary to previous research findings in the higher education sector (Temizer & Turkyilmaz, 2012; Nesset & Helgesen, 2009).

2.8.2 The Relationship between Student Loyalty and Image

Fishbein and Ajzen (1975) noted that attitudes are functionally related to behavioural intentions. Johnson et al. (2001) argue that corporate image as an attitude, should have a direct influence on customer loyalty. Several researchers suppose that favourably perceived images can affect loyalty positively (Selnes, 1993; Rindova and Fombrun, 1999; Nguyen & Leblanc, 1998/2001; Johnson et al., 2001; MacMillan, Money, Downing, & Hillenbrand, 2005). The findings of Andreassen and Lindestad's (1998) study in the Norwegian tourism industry reveal a positive causal relationship existing between corporate image and customer loyalty. Nguyen and Leblanc's (1998, 2001) empirical studies show the positive impact of corporate image on customer loyalty in the education, retail, telecommunication, and financial service sectors. Dick and Basu (1994) note that having a favourable image towards a service provider can lead to a customer's repeat patronage. Kandampully and Hu's (2007) findings on the hotel industry illustrate believe that corporate image is a significant factor in enhancing customer loyalty.

Since it is essential to build image in order to attract and retain students, image is considered to be a significant driver of Student Loyalty (Standifird, 2005; Bush et al., 1998; Sevier, 1994). University Image is reported to have an impact on student behavioural intentions as shown in several studies (Clemes et al., 2013; Clemes et al., 2008). For example, in Helgesen and Nesset's (2007a) study, they measured student perceptions of two distinct concepts: image of the University College and image of the Study Programme. The findings of Helgesen and Nesset (2007a) show that the image of the University College is directly related to student loyalty, while the image of the Study Programme only has an indirect relationship with student loyalty via the image of the University College.

2.8.3 The Relationships between Image, Service Quality and Student Satisfaction

Technical and functional quality contribute to the establishment of customer perceptions of corporate image (Grönroos, 1984). Corporate image is defined by Lai et al. (2009) as a perception of an organization held by customers in their memories. Moreover, image can work as a filter that may influence the perception of a company's operation (Lai et al., 2009). Aydin and Özer (2005) argue that Service Quality may be considered to be a function of consumption experiences, while the authors maintain that corporate image results from the overall consumption experiences of customers. Therefore, Aydin and Özer (2005) indicate that the formation of customers' perceptions

of corporate image should be directly influenced by customers' perceptions of service quality. Several other empirical studies also show the positive impact of customers' perceived quality on the formation of customers' perceived corporate image (Clemes, Shu, et al., 2014; Clemes et al., 2013; Lai et al., 2009; Aydin & Ozer, 2005; Bloemer, De Ruyter, & Peeters, 1998; Nguyen & Leblanc, 1998). For example, Clemes et al.'s (2013) findings on China's higher education industry reveal a critical, positive impact of HEIs Service Quality on University Image. Clemes, Shu, et al.'s (2014) also report a significant and positive impact of Service Quality on corporate image in the Chinese mobile communication industry.

Kassima and Souiden (2007) identify image as an extremely important component of the success of an organisation. Several empirical studies show that not only will customers have favourable perceptions of corporate image, but also that a company will hold a strong corporate image of itself if customers receive high levels of Service Quality from the company (Kandampully, Juwaheer, & Hu, 2011; Hu, Kandampully, & Juwaheer, 2009; Cheng, Lai, & Yeung, 2008; Nguyen & Leblanc, 1998).

The concept of corporate image as a function of the amassed effect of customer satisfaction or dissatisfaction is supported by several marketing scholars (Fornell, 1992; Bolton & Drew, 1991; Johnson & Fornell, 1991; Oliver & Linda, 1981). Corporate image is claimed by Andreassen and Lindestad (1998) to create a halo effect on the satisfaction judgments of customers. Therefore, customer attitudes towards an organisation can be improved if they are satisfied with the service, and these improved attitudes will then have a positive effect on customer satisfaction with the organisation (Andreassen & Lindestad, 1998). However, Nguyen and LeBlanc (1998) argue that a high level of customer satisfaction does not necessarily lead to a favourable corporate image. This implies that there is no significant direct impact of customer satisfaction on corporate image (Nguyen & LeBlanc, 1998).

Sung and Yang (2008) point out that corporate image has not been researched extensively in a higher education context. Kuo and Ye (2009) argue that customers having favourable perceptions of the institution may evaluate the institution's services in a more positive way. The findings of Kuo and Ye's (2009) study reveal that there is a positive relationship between Image and Student Satisfaction. Other empirical studies also confirm that Student Satisfaction is positively affected by student perceptions of Image (Clemet et al., 2013; Clemes et al., 2008; Alves & Raposo, 2010; Palacio, Meneses, & Perez, 2002; Andreassen & Lindestad, 1998).

2.9 Measuring Service Quality

2.9.1 The SERVQUAL Scale

The SERVQUAL scale developed by Parasuraman et al. (1988) is an instrument that has been used to measure Service Quality in several service industries (Sahney, Banwet, & Karunes, 2004). The SERVQUAL scale has also been used in the higher education sector for assessing student perceptions of Service Quality in higher education institutions (Ho & Wearn, 1995; Sahney et al., 2004; Russell, 2005; Azman et al., 2009; Wei & Ramaln, 2011).

The SERVQUAL scale, which is based on the disconfirmation paradigm, was used originally to evaluate the level of customer satisfaction. The disconfirmation paradigm suggests that a customer's satisfaction level towards a product/service depends on the level of disconfirmation, which ranges from negative disconfirmation, confirmation, and positive disconfirmation (Churchill & Suprenant, 1982). When the performance of the product/service is lower than the expectations of the customer, negative disconfirmation occurs and results in customer dissatisfaction. When the performance of the product/service evenly matches the expectations of the customer, confirmation occurs and may lead to either customer satisfaction or dissatisfaction. When the performance of the product/service exceeds the expectations of the customer, positive confirmation occurs and results in customer satisfaction (Churchill & Suprenant, 1982).

The original SERVQUAL instrument consists of 22 pairs of items representing five Service Quality dimensions (tangibles, reliability, responsibility, assurance, and empathy) for evaluating the level of customer expectations over the actual service performance delivered. The 22 items were used to measure the gaps between customer expectations of a service and their perceptions of the actual service delivery. A positive gap occurs when customers' perceptions of service exceed their expectations, whilst a negative gap occurs when customers' perceptions of service do not match their expectations (Parasuraman et al., 1988).

Parasuraman et al.'s study (1988) notes that the SERVQUAL instrument provides a better measurement of customers' expectations and perceptions of the service, with good reliability and validity, and is applicable across a broad spectrum of service industries. Examples are the adaptation and use of the SERVQUAL instrument for research in the information systems industry (Kettinger & Lee, 1994; Pitt, Watson, & Kavan, 1995), the health care industry (Lam, 1997), the tourism industry (Tribe & Snaith, 1998), the saloon industry (Harrison-Walker, 2000), the banking industry (Ravichandran, Tamil Mani, Arun Kumar, & Prabhakaran, 2010), and the higher education sector (Azman, Muhammad Madi, & Balakrishnan, 2009; Wei & Ramaln, 2011).

2.9.1.1 Criticism of the SERVQUAL Instrument

Although several modifications and refinements have been made to the original SERVQUAL scale over a period of years (Parasuraman, Zeithaml, & Berry, 1994; Parasuraman, Zeithaml, & Berry, 1991), the SERVQUAL instrument is criticized by service marketing academics because it has certain limitations on its applicability and its appropriateness for use in measuring Service Quality in the service sector (Brady & Cronin, 2001; Van Dyke, Kappelman, & Prybutok, 1997; Buttle, 1996; Cronin & Taylor, 1994, 1992; Brown, Churchill, & Peter, 1993; Teas, 1993; Oliver, 1993; Babakus & Boller, 1992; Carman, 1990). According to Buttle (1996), criticism of the SERVQUAL instrument can be divided into a theoretical criticism (A) and an operational criticism (B).

(A) Theoretical Criticisms of the SERVQUAL Instrument

Process orientation and dimensionality are the two major theoretical criticisms of the SERVQUAL instrument. Since four of the five dimensions of the SERVQUAL instrument concentrate on measuring human interaction, the SERVQUAL instrument has been criticised, in terms of process orientation, for focusing too much on measuring the functional quality dimension of the Service Quality (Kang & James, 2004; Mangold & Babakus, 1991; Richard & Allaway, 1993). Therefore, the SERVQUAL instrument may produce biased information in understanding customer behaviour, due to its heavy emphasis on evaluations of the functional quality dimension of the Service Quality (Richard & Allaway, 1993). Ling et al. (2010) claim that the evaluations of both the functional quality and the technical quality may enable a more accurate prediction of customer behaviour in a service marketing context. Buttle (1996) notes that the service encounter does not only include the functional quality (the personal interactions between customers and employees) but also the technical quality (the interactions between customers and the visible or physical tangibles). The SERVQUAL instrument, (which lacks a technical dimension), results in difficulties for customers in evaluating the technical quality, either before or after the service delivery process (Kang & James, 2004). Hence, Hausman (2003) notes that customers may evaluate Service Quality and performance based heavily on the functional quality (when using the SERQUAL instrument).

In terms of the dimensionalities, the findings of numerous studies that replicated the original study and that adopted the SERVQUAL instrument, failed to confirm the five dimensions of SERVQUAL. For example, Babakus and Boller (1992) question the suitability of the SERVQUAL instrument for measuring Service Quality in a wide range of services, and they concluded the inappropriateness of using the SERVQUAL instrument as a standard measurement scale for all services. In addition, Babakus and Boller (1992) recommend that measurements should be designed for specific service industries. The authors noted that the SERVQUAL instrument was adopted by Carman (1990) to measure Service Quality in four different service industries (dental school patient clinic, business

school placement centre, tyre store, and acute care hospital) and the limitations of the SERVQUAL instrument in its application were found. The findings of Carman (1990) reveal that the five dimensions of the SERVQUAL instrument are not completely generic across the four different service settings. Carman (1990) suggested that modifications, depending on the nature of the service industry that is to be investigated using the SERVQUAL instrument, are necessary. Moreover, Chen and Ting (2002) doubt the advisability of applying the five dimensions of the SERVQUAL instrument universally in measuring the perceived Service Quality in different service industries, since both the business operation and environment in which different services operate varies.

(B) Operational Criticism of the SERVQUAL Instrument

The two major operational criticisms of the SERVQUAL instrument are the process of administering lengthy questionnaires and the process of the rating scales. Carman (1990) criticises the research approach adopted by Parasuraman et al. (1988) because respondents are required to finish two sets of different questionnaires relating to expectations and experiences simultaneously. Clow and Vorhies (1993) argue that respondents may indicate that their expectations are greater than they actually were before the service encounter, if the evaluations of expectations and experience are measured simultaneously. Buttle (1996) identified that customers who have a negative experience with the service tend to overstate their expectations, therefore, a larger gap between experiences and expectations occurs; while customers who have a positive experience with the service tend to understate their expectations, therefore, a smaller gap occurs.

These criticisms of the SERVQUAL instrument led to the development of alternative measure instruments, such as SERVPERF and HEdPERF, to measure customer perceived service quality.

2.9.2 The SERVPERF Scale

The SERVPERF scale (a performance-based approach) is introduced as an alternative method for measuring Service Quality (Cronin & Taylor, 1992). The SERVPERF scale, which measures customers' perceptions of service performance only, is different from the SERVQUAL scale that measures the gap between customers' perceptions and expectations of service performance. Cronin and Taylor (1992) note that the performance-based SERVPERF scale has a higher degree of model fit, and explains more of the variations in the measure of Service Quality than the gap-based SERVQUAL scale. In addition, some researchers argue that since little empirical evidence supports that customers evaluate Service Quality in terms of the disconfirmation paradigm, therefore, it is inadequate to use the gap-based SERVQUAL scale to measure Service Quality (Cronin & Taylor, 1992; Carman, 1990). The empirical results of several studies strongly support the use of the performance-based SERVPERF scale as developed by Cronin and Taylor (1992) for measuring of Service Quality

over the SERVQUAL scale (Babakus & Boller, 1992; Brady, Cronin, & Brand, 2002; Dabholkar, Shepherd, & Thorpe, 2000; Brown et al., 1993; Carman, 1990; Jain & Gupta, 2004; Zhou, 2004).

Parasuraman et al. (1994) defend that it is appropriate to measure customers' expectations so as to understand customers' expectations. The authors also claim that the superior diagnostic value of the SERVQUAL scale more than offset the loss in the predictive power of the SERVQUAL scale. Zeithaml et al. (1996) later concede that an instrument measuring customer experience only, is the most valid way to measure perceived service quality. Moreover, the authors support that if the primary purpose of a research is to explain the variance in a dependent construct, the performance-based approach is more appropriate than the gap-based approach.

2.9.3 The HEdPERF scale

Although the SERVPERF scale has been developed and subsequently proven to be the superior instrument for measuring Service Quality over the SERVQUAL scale in the service industry, it did not provide a better perspective for measuring the HEI Service Quality (Abdullah, 2006a). Abdullah (2006b) also suggests that the SERVPERF scale may not be a totally adequate instrument for assessing the perceived Service Quality in the higher education sector. Therefore, a 'higher education performance-only' scale – HEdPERF, is proposed by Abdullah (2006a, 2006b) as a new and more comprehensive performance-based measuring scale for capturing the authentic determinants of HEI Service Quality.

Adbullah (2006b) compared and empirically examined the HEdPERF scale against two alternatives, namely the SERVPERF scale and the merged HEdPERF-SERVPERF scale, in order to determine which instrument has the superior measuring capability in terms of unidimensionality, reliability, validity, and explained variance. The comparative results of Adbullah's (2006b) study demonstrate that the HEdPERF scale captures more variance relative to that of the SERVPERF scale. The HEdPERF instrument for measuring HEI service quality is a 41 item scale, that is composed of 13 items adapted from the SERVPERF scale, and 28 items generated from the literature review and various qualitative research conducted by the author, such as focus groups, pilot test and expert validation. The findings of Adbullah (2006b) demonstrate that the HEdPERF scale is a better fit than the other two instruments in terms of the more reliable estimations, the greater criterion and construct validity, and the greater explained variance. Consequently, the findings show an apparent superiority of the modified HEdPERF scale for measuring HEI Service Quality over the SERVQUAL and the SERVPERF scales (Adbullah, 2006a, 2006b).

Ali, Zhou, Hussain, Nair, and Ragavan's (2016) results validate the HEdPERF scale in the Malaysian higher educational context to assess Malaysian public universities' service quality and to investigate the impact of service quality on international student satisfaction, institutional image and loyalty.

In Adbullah's (2006a) study, a six-factor structure (HEdPERF) is proposed to measure perceived Service Quality in the higher education sector. The six factors are: non-academic aspects, academic aspects, reputation, access, programme issues, and understanding. However, in Adbullah's (2006b) study, only four dimensions are confirmed in the factor analysis and they are: non-academic aspects, academic aspects, reliability, and empathy. The four factors identified do not accord with either the six-factor structure of HEdPERF or the five-factor structure of SERVPERF. Instead, the new dimensions are the combination of two factors (non-academic aspects and academic aspects) from HEdPERF and two factors (reliability and empathy) from SERVPERF (Adbullah, 2006b).

The questionnaire used as the data collection instrument in the HEdPERF instrument is also criticized because it mostly focuses on the administrative parts of the HEI (Sultan & Tarafder, 2007; Sultan & Wong, 2010). Only a few statements are related to the academic aspects of the HEI. The questionnaire is a 22 item modified duplication of the items in the SERVPERF scale and is used to measure the performance-based service quality in an HEI. Sultan and Wong (2010) note that the HEdPERF scale fails to demonstrate the five-factor structure of the SERVPERF scale. Moreover, many items of the HEdPERF questionnaire violate the principles of a good questionnaire in terms of the content and face validity. There are also many cross loadings and low factor loadings (below 0.3) of the initial factor analysis (Sultan & Wong, 2010).

Therefore, in light of the criticisms of SERVQUAL and its replication and with regard to the support for Cronin and Taylor's (1992) performance-based approach, Cronin and Taylor's (1992) approach is used to measure service quality in this current study. In addition, this study uses a multidimensional and multilevel approach for measuring service quality due to its support from several marketing academics in various service industries (e.g., Clemes, Shu, et al., 2014; Clemes et al., 2013; Clemes, Brush, et al., 2011; Clemes, Gan, et al., 2011; Dagger et al., 2007; Howat & Assaker, 2013; Lu, Zhang, & Wang, 2009; Wu & Cheng, 2013).

2.9.4 The Hierarchical Modelling Approach

Marketing academics agree that Service Quality is a hierarchical and multidimensional construct (Brady & Cronin, 2001; Carman, 1990; Dabholkar et al., 1996; Grönroos, 1984; Parasuraman et al., 1988; Rust & Oliver, 1994). Therefore, based on the idea that Service Quality is a multidimensional construct with a hierarchical structure (Brady & Cronin, 2001), a hierarchical and multidimensional model is introduced. It is then extended by Brady and Cronin (2001) on the basis of the retail service

quality model proposed by Dabholkar et al. (1996) as a framework for measuring Service Quality. According to Brady and Cronin (2001) and Dabholkar et al. (1996), customer perceived service quality is proposed to be not only multidimensional but also occurring at various levels; therefore, the hierarchical, multi-level and multidimensional framework is believed to be an improved and more complete method for explaining the complexities of customer perceptions of Service Quality.

The hierarchical model has been adopted and modified by a number of marketing academics for the conceptualisation and measurement of Service Quality in various service contexts such as education (Clemes et al., 2013; Clemes et al., 2008), health services (Dagger et al., 2007), mHealth services (Akter, D'Ambra, Ray, & Hani, 2013), mobile communication services (Lu et al., 2009), the motel industry (Clemes, Gan, et al., 2011), public aquatic centres (Howat & Assaker, 2013), the sports industry (Clemes, Brush, et al., 2011; Ko & Pastore, 2005; Alexandris, Zahariadis, Tsorbatzoudis, & Grouios, 2004), mobile communication industry (Clemes, Shu, et al., 2014), electronic services (Fassnacht & Koses, 2006), the airline industry (Wu & Cheng, 2013), transport services (Martínez & Martínez, 2007), the travel industry (Martínez & Martínez, 2008), gaming industry (Wu & Hsu, 2012), life insurance services (Mittal, Gera, & Singhvi, 2013), retail banks (Hossain, Dwivedi, & Naseem, 2015), hairdresser/barber services and local phone services (Pollack, 2009), and agribusiness (Gunderson et al., 2009).

All these studies provide empirical evidence and add support to Cronin and Taylor's (1992) performance-based approach, Brady and Cronin's (2001) and Dabholkar et al.'s (1996) multidimensional and hierarchical model of service quality. The following section provides a review of using the hierarchical models for the conceptualisation and measurement of service quality as found in the service marketing literature.

2.9.4.1 The use of Hierarchical Models in various industry settings

Clemes, Shu, et al. (2014) propose and test a hierarchical model of service quality for the Chinese mobile communication industry in order to identify the dimensions of mobile communications service quality and to investigate the interrelationships among service quality, customer perceived value, corporate image, perceived switching costs, customer satisfaction, and customer loyalty. The results of this study confirm three primary dimensions (Interaction Quality, Physical Environment Quality, and Outcome Quality) and nine sub-dimensions of mobile communication service quality. The findings illustrate that Interaction Quality has the greatest impact on service quality in the mobile communication industry.

Hossain et al.'s (2015) study is the first initiative explaining retail banking service quality using a hierarchical reflective model and presenting the three dimensions (Station Quality, Interaction Quality, and Outcome Quality) and nine sub-dimensions of retail banking services. The findings of

Hossain et al. (2015) show that Interaction Quality has the greatest impact on the service quality of a retail bank, while accessibility and tangible features are the two main drivers of Interaction Quality. The authors also emphasize that this study can provide a clearer picture of the customers' perceptions to the service providers in order to assist them to achieve total quality in retail banking.

Howat and Assaker (2013) propose a hierarchical and multilevel model to identify the dimensions of service quality of public aquatic centres in Australia, as well as to examine the structural relationships among perceived quality, perceived value, satisfaction, and loyalty in the context of public aquatic centres. The results of this study reveal that four first-order process quality dimensions (Facility presentation, Core services, Secondary services, and Staff) are significant in determining the higher-order perceived quality construct. Moreover, the results indicate that the two dimensions of Facility presentation and Staff have the strongest influence on perceived quality construct. Howat and Assaker's (2013) study contributes to an enhanced conceptualisation of the perceived quality construct in the public aquatic centres setting.

Wu and Cheng (2013) propose and test a hierarchical model of service quality for the airline industry in order to enhance understanding of airline industry service quality. The results of this study indicate that the proposed model of service quality is valid in the airline industry and empirical evidence supports the view that there are four dimensions of service quality (Interaction Quality, Physical Environment Quality, Outcome Quality and Access Quality) and eleven sub-dimensions. The findings from Wu and Cheng's (2013) qualitative research, together with the review of the literature, suggest that Access dimension is necessary to be the fourth primary dimension in this study. Moreover, the findings of this study also note that Outcome dimension has the greatest impact on service quality in the airline industry. Wu and Cheng (2013) believe that the proposed hierarchical and multidimensional model may fill the gap that exists in the literature regarding the conceptualisation of service quality in the airline industry.

Akter et al.'s (2013) study aims to theoretically conceptualise and empirically validate a multidimensional service quality scale for measuring service quality, as well as to further investigate the relationships among service quality, satisfaction, and continuance in a mHealth context. mHealth is conceptualised by Akter et al. (2013) as a new paradigm of emerging information technology that will transform the delivery of healthcare around the world by making it more accessible, affordable and available. The findings of Akter et al. (2013) show that mHealth service quality is a hierarchical and multidimensional structure consisting of three primary dimensions (System Quality, Interaction Quality, and Information Quality) and eight sub-dimensions. Therefore, mHealth service quality as the third-order construct, is reflected by three second-order constructs (primary dimensions), which

in turn are reflected by eight first-order constructs (sub-dimensions). Akter et al. (2013) also note that both the primary dimensions and sub-dimensions vary in their importance in this study.

Clemes, Brush, et al. (2011) claim that it is very important for sports organisations to understand how spectators perceive service quality, and how these perceptions affect value, satisfaction and behavioural intentions, in order to succeed in the increasingly competitive entertainment environment. A hierarchical model of the professional sport experience is developed and tested in Clemes, Brush, et al.'s (2011) study for measuring service quality in the sporting industry. Moreover, this study aims to further investigate the interrelationships between service quality, value, satisfaction, and behavioural intentions as well as the role of fanship. The findings of Clemes, Brush, et al.'s (2011) study provide support for three second-order primary dimensions of service quality (Interaction Quality, Physical Environment Quality, and Outcome Quality) and eleven first-order sub-dimensions in the proposed hierarchical model. Clemes, Brush, et al. (2011) note that both primary dimensions and sub-dimensions vary in the importance, and Outcome dimension is the most important primary dimension in this study.

A hierarchical model is used in Clemes, Gan, et al.'s (2011) study as a framework for identifying the dimensions of service quality, as well as for examining the interrelationships among service quality, value, customer satisfaction, and behavioural intentions in the motel industry. Clemes, Gan, et al. (2011) note that motel service quality is a hierarchical and multidimensional structure consisting of three primary dimensions (Interaction Quality, Physical Environment Quality, and Outcome Quality) and ten sub-dimensions. The findings of Clemes, Gan, et al.'s (2011) study show that Outcome Quality is perceived as the most important primary dimension by motel customers, followed by Physical Environment Quality and Interaction Quality. The importance of sub-dimensions also varies in this study.

Wu and Hsu (2012) propose and test a multidimensional and hierarchical model of service quality for the gaming industry in order to identify the dimensions of gaming industry service quality. The results of this study indicate that there are three primary dimensions (Interaction Quality, Physical Environment Quality, and Outcome Quality) and ten sub-dimensions. Wu and Hsu (2012) maintain that their findings provide an improved understanding of how customers evaluate service quality in gaming industry.

Pollack's (2009) study applies the hierarchical service quality model as proposed by Brady and Cronin (2001) to two new service contexts (hairdresser/barber services and local phone services) to further explore the validity and reliability of the hierarchical service quality model. Pollack's (2009) study also aims to further investigate the interrelationships between service quality, satisfaction, and customer loyalty. The findings of this study indicate that there are three primary dimensions (Interaction

Quality, Physical Environment Quality, and Outcome Quality) and nine sub-dimensions of overall service quality for both service industries. Moreover, the study also suggests that the significance of sub-dimensions and primary dimensions differs, depending on the type of service. For example, attitude and behaviour are the two main drivers of interaction quality for the phone services, while for the hairdresser/barber services, attitude and expertise are the two main drivers of interaction quality.

Gunderson et al. (2009) adopt Brady and Cronin's (2001) hierarchical model of service quality as a useful tool for measuring customer perceived service quality in the American agribusiness industry. The proposed model developed by Gunderson et al. (2009) consists of three primary dimensions (Interaction Quality, Physical Environment Quality, and Outcome Quality) and nine sub-dimensions. The findings of Gunderson et al. (2009) note that the significance of primary dimensions and sub-dimensions differs, while interactions with employees and the outcomes matter most to customers in agronomic services. Moreover, the model is suggested as a tool that can be used by suppliers of agricultural inputs, to improve customer perceived service quality.

As noted by Martínez & Martínez (2008), the majority of studies in the travel agency industries have applied the SERVQUAL instrument to measuring customer perceived service quality. However, the SERVQUAL instrument has been criticised by several marketing researchers. Hence, Martínez & Martínez (2008) adopt the multilevel and multidimensional model as introduced by Brady and Cronin (2001) so as to provide more accurate customer assessments of service quality in the Spanish travel industry. The findings of this study indicate that customers evaluate three primary dimensions (personal interaction, physical environment, and outcome) and seven sub-dimensions to form their overall perceptions of travel agency service quality, while Outcome Quality has the greatest impact on the travel agency service quality (Martínez & Martínez, 2008).

A multidimensional hierarchical scale for measuring health service quality in Australia is developed and empirically validated by Dagger et al. (2007). The ability of the scale to predict customer satisfaction and behavioural intentions is also investigated in this study. The findings of Dagger et al. (2007) support the view that customers evaluate service quality at three levels: an overall level, a dimensional level, and a sub-dimensional level. Nine sub-dimensions are identified that drive the perceptions of four primary dimensions (Interpersonal Quality, Technical Quality, Environment Quality, and Administrative Quality), the four primary dimensions are to drive service quality perceptions. Moreover, the findings of this study indicate that Technical Quality and Administrative Quality have the greater effect on service quality perceptions. Dagger et al. (2007) maintain that their findings provide an improved understanding of how customers evaluate service quality in health care service settings.

Martínez & Martínez (2007) develop and test a hierarchical and multidimensional model based on Brady and Cronin's (2001) framework and Dabholkar et al.'s (1996) framework, for measuring service quality in the Spanish urgent transport industry. The findings of Martínez & Martínez's (2007) study provide empirical support for the notion that service quality is a higher-order factor defined by four primary dimensions (Personal Interaction, Design, Physical Environment, and Outcome) and ten sub-dimensions. Martínez & Martínez (2007) suggest that it is necessary to include Design dimension as an additional primary dimension of service quality in their study based on the findings from their qualitative study and the review of the quality literature. Moreover, the findings of this study indicate that the significance of primary dimensions and sub-dimensions differs, for example, Outcome dimension has the greatest significance, followed by Physical Environment dimension and Personal Interaction dimension, while Design dimension has the least significance in this study.

Fassnacht and Koese (2006) adopt Rust and Oliver's (1994) framework for measuring service quality in the electronic services industry in Germany. Service quality is viewed as a hierarchical construct for the conceptualisation of electronic service quality defined by three dimensions (Environment Quality, Delivery Quality, and Outcome Quality) and nine sub-dimensions. The findings of Fassnacht and Koese's study (2006) note that Outcome dimension is of the relatively high importance. The study also concludes that the hierarchical approach may be more easily applied to a broad range of electronic services for the measuring of service quality, than the traditional approaches, such as SERVQUAL and SERVPERF.

Chapter 3

Conceptual Research Model and Hypotheses Development

3.1 Introduction

The development of the conceptual research model used in this study is outlined in this chapter. The conceptual research model is a comprehensive hierarchical model that illustrates the formation of higher education service quality as perceived by students of China's HEIs, and the interrelationships that exist among five higher order constructs: Service Quality, Student Satisfaction, Student Involvement, University Image, and Student Loyalty. A discussion of the hypotheses that are tested in order to satisfy this study's four research objectives is also presented in this chapter.

3.2 Model Development

The major research objectives of this study are to identify a higher education service quality measurement model and determine the interrelationships between the five higher order service marketing constructs for China's higher education sector. The hierarchical service quality model (see Figure 3.1) used in this study is based on the hierarchical service quality models developed by Brady and Cronin (2001) and Dabholkar et al. (1996).

The conceptual research model illustrates that the Chinese university students evaluate higher education service quality at two ordered and hierarchical levels: a primary dimensional level and an overall level. The primary dimensional level consists of four primary dimensions: Interaction Quality, Physical Environment Quality, Outcome Quality, and Social Factors Quality. University students evaluate the higher education service quality offered by a HEI through four primary dimensions and the perceptions of all four primary dimensions are combined together to reflect students' overall higher education service quality perceptions (Brady & Cronin, 2001; Clemes et al., 2013; Clemes, Gan, et al., 2011; Clemes, Wu, Hu, & Gan, 2009; Clemes et al., 2008; Dagger et al., 2007). Furthermore, the conceptual research model illustrates the potential interrelationships that may exist among the higher order constructs: Service Quality, Student Satisfaction, Student Involvement, University Image, and Student Loyalty. Students' perceptions of higher education service quality are expected to influence Student Satisfaction, Student Involvement, University Image, and Student Loyalty. University Image is expected to have an influence on both Student Satisfaction and Student Loyalty. Student Involvement is expected to have an impact on both Student Satisfaction and University Image, while Student Involvement is also expected to be the mediating variable that mediates the

relationship between Service Quality and Student Satisfaction, as well as the relationship between Service Quality and University Image. Student Satisfaction is expected to directly influence Student Loyalty. Student Satisfaction is also expected to have a mediating impact on the relationship between Service Quality and Student Loyalty.

3.3 Hypotheses Development

The following hypotheses have been formulated based on a review of the literature as discussed in Chapter2 and focus group discussions as detailed will be discussed in Chapter4.

3.3.1 Hypotheses Relating to Research Objective 1

As suggested by Cronin and Taylor (1994), the dimensional sets of service quality need to be confirmed for each industry setting. Moreover, Ueltschy and Krampf (2001) suggest that service quality scales tend to be culturally sensitive. Social Factors Quality has not been explored or confirmed as a primary dimension of service quality in a higher educational context. However, scholars do report that perceived higher education service quality consists of at least 3 primary dimensions: Interaction Quality, Physical Environment Quality, and Outcome Quality (Brady & Cronin, 2001; Clemes et al., 2013; Clemes et al., 2008; Jain, Sinha, & De, 2010; Ling et al., 2010; Mai, 2005).

University students aggregate the perceptions of Interaction Quality, Physical Environment Quality, Outcome Quality, (Clemes et al., 2013; Clemes et al., 2008), and Social Factors Quality to form their overall higher education service quality perceptions. The primary dimensions of higher education service quality are hypothesized to have a significant positive impact on students' overall perceptions of service quality. Therefore, the following four hypotheses are formulated:

H1. There is a significant positive relationship between the Interaction Quality primary dimension and students' overall service quality perceptions.

H2. There is a significant positive relationship between the Physical Environment Quality primary dimension and students' overall service quality perceptions.

H3. There is a significant positive relationship between the Outcome Quality primary dimension and students' overall service quality perceptions.

H4. There is a significant positive relationship between the Social Factors Quality primary dimension and students' overall service quality perceptions.

3.3.2 Hypothesis Relating to Research Objective 2

Several researchers have assessed which primary dimensions have the least and most impact on customers' overall perceptions of service quality in various industries: such as higher education (Clemes et al., 2013; Clemes et al., 2008); mobile communications (Clemes, Shu, et al., 2014); accommodation (Clemes, Gan, et al., 2011; Clemes et al., 2009), and online paid services (Fassnacht & Koese, 2006). The findings relating to the primary dimensions in these studies are varied as the results suggest that Outcome Quality is the most important primary dimension (Clemes et al., 2013; Fassnacht & Koese, 2006), while other results indicate that Interaction Quality as the most important (Clemes, Shu, et al., 2014; Clemes et al., 2008). However the relative importance of the four higher education service quality primary dimensions in students' service evaluations has not been clearly identified. Therefore, the following hypothesis is formulated in order to determine the most and least important primary dimensions of higher education service quality for HEIs:

H5. Students will vary in their perceptions of the importance of each of the primary dimensions.

3.3.3 Hypotheses Relating to Research Objective 3

Several researchers have investigated the interrelationships between service quality and the higher order constructs in various industries, for example, customers' perceptions of service quality are proposed to positively affect customer satisfaction (Aga & Safakli, 2007; Brown & Mazzarol, 2009; Clemes, Brush, et al., 2011; Clemes et al., 2013; Clemes et al., 2009; Clemes, Gan, et al., 2011; Cronin & Taylor, 1992; Douglas, McClelland, & Davies, 2008; Lai et al., 2009; Lee, Lee, & Yoo, 2000; Sumaedi, Bakti, & Metasari, 2011; Tam, 2004), corporate image (e.g. university image) (Aydin & Özer, 2005; Clemes et al., 2013; Clemes et al., 2009; Hu et al., 2009; Kandampully & Hu, 2007; Lai et al., 2009; Nguyen & Leblanc, 1998), and customer loyalty (Clemes et al., 2009; Cronin et al., 2000; Dado, Petrovicova, Cuzovic, & Rajic, 2012; Kyle et al., 2010; Lai et al., 2009; Qin & Prybutok, 2008; Saha & Theingi, 2009). The interrelationships can be assessed in a higher educational context since students are regarded as customers of institutions (Yousapronpaiboon, 2014; Helgesen, 2008).

Moreover, Astin (1999) and Hernandez et al. (1999) suggest that there is a relationship existing between students' perceptions of service quality and student involvement. However, to date, no empirical research has investigated these interrelationships within the higher educational context. Therefore, the following four hypotheses are formulated:

H6: Higher perceptions of Service Quality positively affect Student Satisfaction.

H7: Higher perceptions of Service Quality positively affect University Image.

H8: Higher perceptions of Service Quality positively affect Student Involvement.

H9: Higher perceptions of Service Quality positively affect Student Loyalty.

However, some researchers have confirmed a direct, significant relationship between service quality and customer loyalty (Clemes et al., 2009), and service quality and student loyalty (Annamdevula & Bellamkonda, 2016), while others indicate an insignificant causal path between service quality and customer loyalty (Cronin et al., 2000; Hu et al., 2009; Osman & Sentosa, 2013), and service quality and student loyalty (Perin et al., 2012). As suggested in the literature, the relationship between service quality and customer loyalty may be mediated by customer satisfaction (Kuo et al., 2013; Yu & Ramanathan, 2012). In the higher educational context, the possible mediation effect between Service Quality and Student Loyalty has not been tested. Therefore, the following hypothesis is formulated:

H10: Student Satisfaction mediates the relationship between Service Quality and Student Loyalty.

Within the higher educational context, University Image is proposed to positively affect both Student Satisfaction (Alves & Raposo, 2010; Clemes et al., 2013; Clemes et al., 2008; Helgesen & Nesset, 2007b; Kuo & Ye, 2009) and Student Loyalty (Standifird, 2005; Bush et al., 1998; Sevier, 1994). Therefore, the following two hypotheses are formulated:

H11: Higher University Image positively affects Student Satisfaction.

H12: Higher University Image positively affects Student Loyalty.

Student Involvement is proposed to have a positive impact on both Student Satisfaction (Mavondo et al., 2004; Astin, 1999; Hernandez et al., 1999) and University Image (Astin, 1999; Hernandez et al., 1999). However, to date, no other published studies have empirical examined the interrelationship between Student Involvement and Student Loyalty. No research to date has tested Student Involvement as a mediating variable between Service Quality and Student Satisfaction/Service Quality and University Image. Therefore, the following five hypotheses are formulated:

H13: Higher Student Involvement positively affects Student Satisfaction.

H14: Higher Student Involvement positively affects University Image.

H15: Higher Student Involvement positively affects Student Loyalty.

H16: Student Involvement mediates the relationship between Service Quality and Student Satisfaction.

H17: Student Involvement mediates the relationship between Service Quality and University Image.

Further, Student Satisfaction is proposed to positively influence Student Loyalty (Brown & Mazzarol, 2009; Clemes et al., 2013; Clemes et al., 2008; Helgesen & Nesset, 2009; Marzo-Navarro et al., 2005; Schertzer & Schertzer, 2004). Therefore, the following hypothesis is formulated:

H18: Higher Student Satisfaction positively affects Student Loyalty.

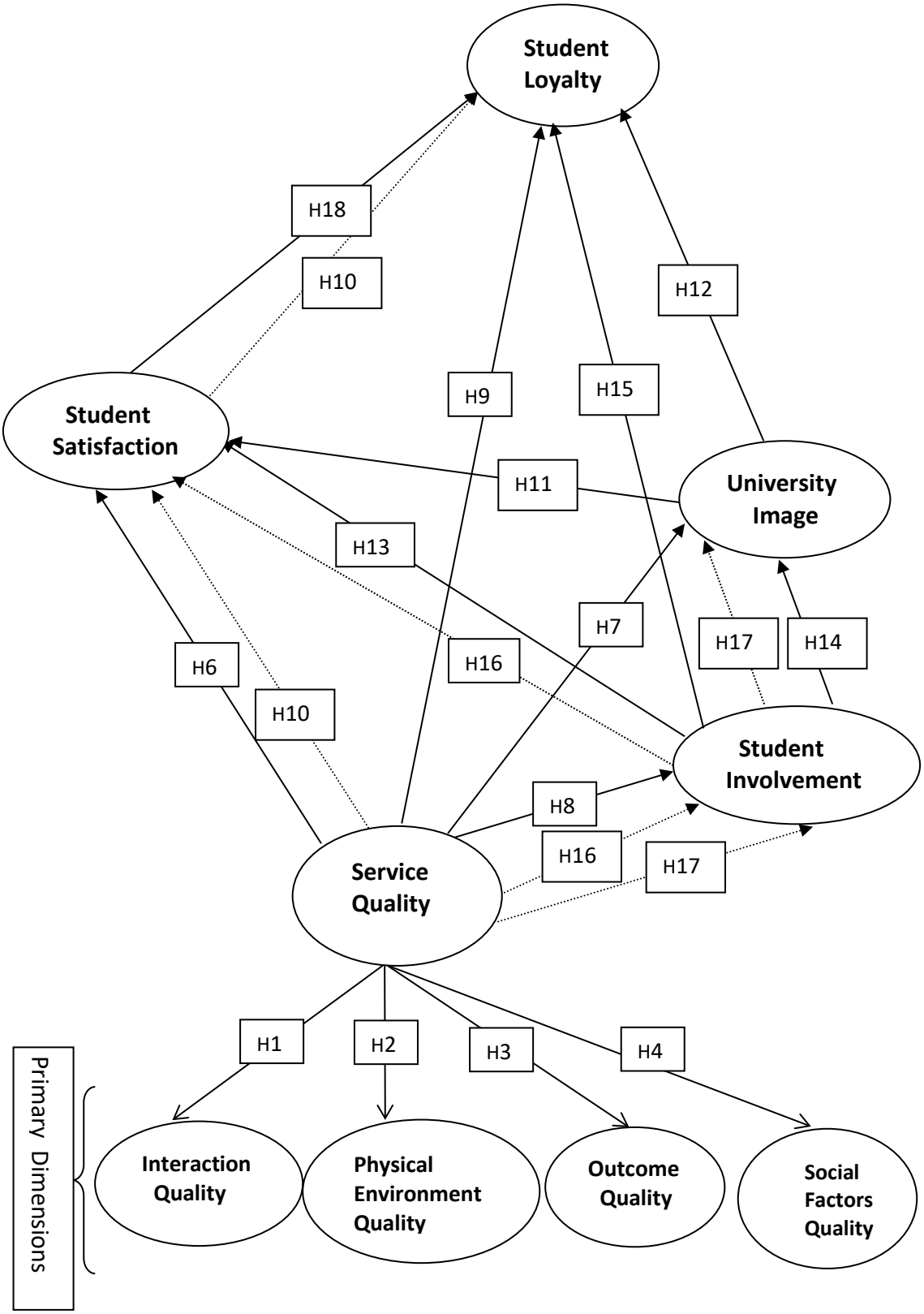
3.3.4 Hypotheses Relating to Research Objective 4

Previous research within the higher educational context (Clemes et al., 2013; Clemes et al., 2008) indicate that students' perceptions of higher education service quality, satisfaction, university image, and future behavioural intentions, may vary according to students' demographic factors; such as gender, age, years-of-study, and study major. Krause & Coates (2008) suggest that different students may have different levels of student involvement. Gender is noted as a demographic variable that may moderate the interrelationships among the higher order constructs in various service industries (e.g. Ridgeway & Correll, 2004; Kwun, 2011; Humbert & Drew, 2010). The focus groups used that took part in this study recommend that the Years-of-study can be an important demographic variable that may moderate the interrelationships among the constructs in the higher educational context. However, published studies on exploring the gender difference and Years-of-study difference of student perceptions relating to the interrelationships among the higher order constructs in the higher education industry are sparse. Therefore, the following hypotheses are formulated to test whether or not the perceptions of the interrelationships among the higher order constructs are different between the First Year and Third Year students, and between Males and Females:

H19. Student perceptions relating to interrelationships among Service Quality, Student Satisfaction, Student Involvement, University Image, and Student Loyalty will differ between the First Year and Third Year students.

H20. Student perceptions relating to interrelationships among Service Quality, Student Satisfaction, Student Involvement, University Image, and Student Loyalty will differ between Males and Females.

Figure 3-1 Proposed Conceptual Research Model and Hypotheses



Chapter 4

Research Methodolgy

4.1 Sample Derivation

The research sample was drawn from the students of Shanghai University and Shanghai Normal University. Both Shanghai University and Shanghai Normal University are representatives of Chinese universities with long histories, and they each have over 23,000 undergraduates (Shanghai University, 2015; Shanghai Normal University, 2015).

The primary data was collected in Shanghai, China, during the period 20th April 2013 to 20th July 2013. Shanghai is not only a global city, but also a leading economic and financial centre in China. A large concentration of high valued-added business services activities, excellent infrastructure, and a well-educated labour force features the city (Euromonitor International, 2015; World Population Review, 2016). Shanghai is the most populous city in China with a population of approximately 23.9 million in 2013 (World Population Review, 2016). The target population for the survey was the first and third year students from Shanghai University and Shanghai Normal University. Students who were under eighteen years old, as well as first year students who were enrolled for the first semester only, were not included in the sample since it may have been difficult for them to interpret the survey questions (Riley, Wood, Clark, Wilkie, & Szivas, 2000).

The research sample was selected using a convenience sampling method. Convenience sampling method was used since it is an interviewing technique that causes the least interruption to the respondents and also allows the data to be collected over the shortest time period possible (Zikmund, Babin, Carr, & Griffin, 2012; Easterby-Smith, Thorpe, & Lowe, 2008). Fink and Kosecoff (1998) note that the convenience sampling method is a simple process that can save the researcher time, money, and effort; especially when a list of all members of a given population is not available, when it is inconvenient to randomly select individuals in a given population, or when it is convenient to select a homogenous sample from a given population for observation. Leary (2004) and Reynolds, Simintiras, and Diamantopoulos (2003) also note that this method can be considered as an acceptable sampling technique if the purpose of the study is to test the theory, and to provide evidence in supporting or rejecting the theory tested, regardless of the makeup of the sample. Furthermore, the advantages of convenience sampling are discussed by academics (Fink & Kosecoff, 1998; Zikmund et al., 2012): 1) relatively inexpensive; 2) convenient; 3) data collection can be conducted in a short time; 4) make data collection process easier.

4.2 Sample Size

Two techniques were used for the data analysis in this study: Exploratory Factor Analysis (EFA) and Structural Equation Modelling (SEM). The sample size was determined according to the requirements of the two data analysis techniques. In general, the reliability of the factors emerging from a factor analysis depend on the size of the sample, although Hair, Black, Babin, Anderson, and Tatham (2010) note that there is no consensus on what the exact sample size should be.

However, most academics (Hair et al., 2010; Kline, 2005; Pallant, 2010) suggest a minimum sample size of 100 or more for conducting EFA, with at least five times as many observations as the number of variables to be analysed, but preferably with a ratio of ten-to-one which is considered to be more acceptable. There were 24 variables to be factor analysed in this study, therefore the sample size required was at least 120 respondents.

Kline (2005) and Hair et al. (2010) suggest that it is not entirely appropriate to run EFA and Confirmatory Factor Analysis (CFA) using the same data; since the results of EFA are subject to capitalisation on chance variation and using CFA to specify a model based on the results of EFA just compounds the problem. Furthermore, Kline (2005) notes that sometimes factor structures identified through EFA may turn out to have a poor fit to the same data when evaluated using CFA. Hence, in this study the researcher deemed it not appropriate to run EFA and CFA using the same data set. Schumacker and Lomax (2004) suggest that a researcher can find the number and type of latent variables in a plausible model by using EFA on a sample of data; once a plausible model is identified another sample of data can be used to confirm or test the model. As a result, two sub-samples were deemed necessary for this study. One sub-sample consisting of 120 respondents was subjected to EFA. The second sub-sample consisting of 250 respondents was subjected to CFA.

For SEM analysis using Maximum Likelihood Estimation (MLE) (Kelloway, 1998; Boomsma, 1983; Cheung, 2013), in general, a sample size of at least 200 to 400 respondents is recommended (Hair et al., 2010; Tanaka, 1993). Also, Tanaka (1993) also notes that the SEM method becomes more sensitive when the sample size becomes large (>400). Almost any difference is then detectable, therefore making goodness-of-fit measures incorrectly suggesting a poor fit. Thus, following the recommendations of Hair et al. (2010) and Tanaka (1993) the ideal sample size for using SEM in this study is between 200 and 400 observations. Accordingly, the minimum sample size for this study was set at 370 usable questionnaires to test the 20 hypotheses and satisfy the 4 research objectives. Subsequently, 420 questionnaires were distributed in order for the actual data collection to guarantee at least 370 usable questionnaires, since 100% completion of questionnaires is highly unlikely (Hair et al., 2010). Few published studies report that a hand-delivered self-administered questionnaire yields a fairly high response rate (e.g. 70% to 80%) (Cynthia, 1997; Clemes, Brush, et

al., 2011). However, recent studies using a self-administered questionnaire on online shopping and education in China report high usable response rates of 94.57% and 78.5%, respectively (Clemes, Gan, et al., 2014; Clemes et al., 2013). In addition, a proportion of questionnaires will be unusable or incomplete and therefore invalid and must be excluded from the analysis (Clemes, Brush, et al., 2011; Tabachnick & Fidell, 2007).

4.3 Questionnaire Design

4.3.1 Construct Operationalisation

The review of the literature discussed in Section 2.7 identified four primary dimensions of service quality for higher education in China: Interaction Quality, Physical Environment Quality, Outcome Quality, and Social Factors Quality. In order to provide an in-depth knowledge of the service quality dimensions, help identify the measurement items pertaining to the four primary dimensions, and gain greater understanding and more insight for developing the questionnaire, four focus group interviews were conducted. Hair, Bush, & Ortinau (2000, p.223) suggest that in marketing research, focus groups have been used for a number of years to *"reveal customer's hidden needs, wants, attitudes, feelings, behaviours, perceptions, and motives regarding services, products, or practices"*. In particular, a focus group is defined by Edmunds (1999, p.4) as a *"group discussion exploring a specific set of issues"*. A focus group is identified as a special group with specific attributes that provides qualitative data related to a specific research topic (Cheng, 2014; Krueger & Casey, 2000). Focus group interviews are a productive method that can assist in defining and developing a questionnaire, thus creating reliable measurement scales (Barbour & Kitzinger, 1999; Hair et al., 2000; Kandampully, Mok, & Sparks, 2001). Focus groups have been recommended by several researchers and have been used for years in service quality studies (Dabholkar et al., 1996; Einasto, 2014; Mosadeghrad, 2014; Parasuraman et al., 1985; Powpaka, 1996).

A focus group interview should consist of six to ten respondents (Cooper & Schindler, 2003), while the focus groups should be as homogeneous as possible (Hair et al., 2000). Accordingly, four small sessions were held once approved by the Lincoln University Human Ethics Committee (HEC). The four focus groups consisted of participants who were eighteen years of age or older, and were First year and Third Year students of Shanghai University and Shanghai Normal University.

The four focus group interviews consisted of eight participants each. The first focus group consisted of eight First Year students from Shanghai University (four female participants and four male participants). The second focus group consisted of eight Third Year students from Shanghai University (four female participants and four male participants). The third focus group consisted of eight First Year students from Shanghai Normal University (three female participants and five male

participants). The fourth focus group consisted of eight Third Year students from Shanghai Normal University (five female participants and three male participants). Overall, thirty-two participants took part in the four focus group interviews, sixteen female participants and sixteen male participants.

Following the recommendation of Churchill (1979), the domain of the constructs was described to the participants at the start of the focus group interviews. Participants were asked to explain all the factors that contribute to their perceptions of higher education service quality as university students. Moreover, participants were requested to evaluate their overall perceptions or experiences as students of higher education institutions, and not to concentrate on one particular encounter. Following this discussion, the participants were asked to place the factors (items) that impact on their perceptions of higher education service quality, under one of the four primary dimensions derived from the literature review of service quality: Interaction Quality, Physical Environment Quality, Outcome Quality, and Social Factors Quality. The participants were asked to discuss whether the Social Factors Quality should be listed as an additional primary dimension or just be a factor under Physical Environment Quality. After an in-depth discussion, the participants emphasized the importance of the Social Factors Quality and recommended that the Social Factors Quality should be listed as an additional primary dimension instead of being a factor under Physical Environment Quality. Finally, the participants were also encouraged to list any additional factors (items) that influenced their perceptions regarding the four primary dimensions of higher education service quality.

The findings generated in the four focus group interviews were recorded and transcribed. The findings from the four focus group interviews and the literature review were then used as the basis for developing the measurement items used in the questionnaire, thus providing valuable information for finalizing the research model.

4.3.2 Pre-testing Procedures

Prior to conducting the survey, a pre-test was conducted in order to improve face validity, and content validity of the initial version of the survey instrument. A measurement has face validity when the measurement appears to measure what it is supposed to measure (Nunnally & Bernstein, 1994; McDaniel & Gates, 1998; Hardesty & Bearden, 2004). Carmines and Zeller (1979, p.20) note that content validity is an assessment regarding *"the extent to which an empirical measurement reflects a specific domain of content"*. Similarly, content validity is defined by Nunnally and Bernstein (1994) as the degree to which a measure's items represent a proper domain of content.

The assessment of face validity and content validity for the initial version of the survey instrument was performed through a two-step process. The first step involved asking three service marketing

experts and two higher education sector experts to review and freely comment on the survey questions. The three service marketing experts and two higher education sector experts also assisted in checking the translation consistency of the questionnaire. The second step involved selecting a small representative group to review the survey questions. A convenience sample was drawn from 30 university students of Shanghai University and Shanghai Normal University who were eighteen years of age or older, and were the First and Third Year students of these two universities. Respondents to the pre-test were encouraged to make comments and suggestions on any questions that they thought were ambiguous or difficult to answer. Minor modifications of the questionnaire, such as clarifying sentences and using appropriate words and question order, were made after the pre-test was complete.

4.3.3 Design and Layout of the Final Draft Questionnaire

All items in Sections A, B, C, D and E use a standard seven-point Likert-type scale ranging from Strongly Disagree (1) to Strongly Agree (7). Only the extreme end-points are labelled; that is, on a scale of 1 to 7, 1 represented Strongly Disagree, and 7 represented Strongly Agree. No labels are used for scale points 2 to 6 since labelling only the end-points provides a better data quality than labelling all of the answer categories (Andrews, 1984; Schall, 2003). In addition, the seven-point Likert-type scale was discussed with each respondent.

Before the questionnaire was ready to be distributed to the target sample, several necessary changes were made to the questionnaire based on the guidelines suggested by Hair et al. (2010) and the focus groups' recommendations and the respondents' feedback. Firstly, the spacing and ease of completing of the questionnaire were improved in order to ensure clarity. Secondly, some of the wording was slightly modified, and some identified items were removed from the questionnaire.

The final version of the questionnaire was composed of five sections (See Appendix 1). Sections A, B, C and D contain the items measuring Interaction Quality (Section A), Physical Environment Quality (Section B), Outcome Quality (Section C), and Social Factors Quality (Section D) respectively (See Table 4-1 to Table 4-4).

Section E (Higher order constructs) contains the items measuring Service Quality, Student Satisfaction, Student Involvement, University Image, and Student Loyalty (See Table 4-5). Section F contains the demographic items regarding gender, age, year of study, major, and average GPA (See Appendix 1). In addition, a formal covering letter was attached to the questionnaire explaining the research background to the respondents (see Appendix 1).

4.3.3.1 Section A – Interaction Quality

Section A includes a total of 9 items measuring Interaction Quality. As presented in Table 4-1, there are seven reflective items for Interaction Quality (a primary dimension), and two items for measuring students' overall perceptions of Interaction Quality.

The items are generated from the focus group discussions and previous studies regarding expertise (LeBlanc & Nguyen, 1997; Peng, 2008), attitudes and behaviours (Clemes, et al., 2001; Sohail & Shaikh, 2004), accessibility (Clemes et al., 2007; Clemes, et al., 2001), personal interaction (Jain et al, 2010), administration staff (Clemes et al., 2007; LeBlanc & Nguyen, 1997), and course content (Clemes et al., 2007; Kwan & Ng, 1999; Peng, 2008). The pre-test, and the CFA confirmed the suitability of the items and scales adapted from these studies. The items are listed in Table 4-1.

Table 4-1 Reflective Items for Measuring Interaction Quality

	NO.	Item	Source
Interaction Quality (7 Items)	IQ 1	Lecturers have good communication skills.	Clemes, et al. (2001)
	IQ 2	Classes are well prepared and organized.	Clemes et al. (2007)
	IQ 3	Lecturers are friendly and helpful.	Jain et al. (2010)
	IQ 4	My lecturers are available during their office hours.	Kwan & Ng (1999)
	IQ 5	My lecturers deal with my problems in a concerned fashion.	LeBlanc & Nguyen (1997)
	IQ 6	My lecturers encourage students to participate in class discussions.	Peng (2008)
	IQ 7	Faculty administrators perform their duties properly.	Sohail & Shaikh (2004)
Overall (2 Items)	IQO 1	Overall, the quality of my interaction with the university staff is excellent.	
	IQO 2	I rate the quality of my interactions with the university staff highly.	

4.3.3.2 Section B – Physical Environment Quality

Section B includes a total of 9 items measuring Physical Environment Quality. As with Table 4-2, there are seven reflective items for Physical Environment Quality (a primary dimension), and two items for measuring students' overall perceptions of Physical Environment Quality.

The items are generated from the focus group discussions and previous studies regarding university accommodation (Arambewela & Hall, 2009; Lagrosen et al., 2004), campus (Clemes et al., 2001; Jain et al., 2010; Peng, 2008), class room (Sohail & Shaikh, 2004), computer room (Lagrosen et al., 2004; Letcher & Neves, 2010), library (Clemes et al., 2007;

Lagrosen et al., 2004), and safety (Arambewela & Hall, 2009). The pre-test, and the CFA confirmed the suitability of the items and scales adapted from these studies. The items are listed in Table 4-2.

Table 4-2 Reflective Items for Measuring Physical Environment Quality

	NO.	Item	Source
Physical Environment Quality (7 Items)	PEQ 1	The classrooms provide a pleasant learning environment.	Arambewela & Hall (2009) Clemes et al. (2001) Clemes et al. (2007) Jain et al. (2010) Lagrosen et al. (2004) Letcher & Neves (2010) Peng (2008) Sohail & Shaikh (2004)
	PEQ 2	The campus has excellent supporting facilities (e.g. accommodation, canteen, and supermarket).	
	PEQ 3	There are enough self-study rooms during the examination period.	
	PEQ 4	The recreational facilities meet students' fitness needs.	
	PEQ 5	The computers are accessible for students.	
	PEQ 6	The library is a good place to study.	
	PEQ 7	The university provides a safe living environment on campus.	
Overall (2 Items)	PEQO 1	Overall, the physical environment provided by the university is excellent.	
	PEQO 2	I rate the university's physical environment highly.	

4.3.3.3 Section C – Outcome Quality

Section C includes a total of 7 items measuring Outcome Quality. As presented in Table 4-3, there are five reflective items for Outcome Quality (a primary dimension), and two items for measuring students' overall perceptions of Outcome Quality.

The items are generated from the focus group discussions and previous studies regarding academic development (Clemes et al., 2007), general education (Kuh et al., 1997; Tam, 2007), vocational preparation (Clemes et al., 2007; Tam, 2007), and personal development (Clemes et al., 2007; Kuh et al., 1997). The pre-test, and the CFA confirmed the suitability of the items and scales adapted from these studies. The items are listed in Table 4-3.

Table 4-3 Reflective Items for Measuring Outcome Quality

	NO.	Item	Source
Outcome Quality (5 Items)	OQ 1	I have gained a background and specialization for further education in a professional discipline.	Clemes et al. (2007) Kuh et al. (1997) Tam (2007)
	OQ 2	I have developed the ability to apply theory to practice.	
	OQ 3	I have gained the ability to work in a team.	
	OQ 4	I have developed communication skills (e.g. oral presentation, report writing).	
	OQ 5	I have developed personal skills (e.g. problem solving, time management).	
Overall (2 Items)	OQO 1	Overall, the quality of my learning experience at the university is excellent.	
	OQO 2	I evaluate my learning outcomes at the university highly.	

4.3.3.4 Section D – Social Factors Quality

Section D includes a total of 7 items measuring Social Factors Quality. As presented in Table 4-4, there are five reflective items for Social Factors Quality (a primary dimension), and two items for measuring students' overall perceptions of Social Factors Quality.

The items are generated from the focus group discussions and previous studies (Athiyaman, 1997; Austin, 1984; Austin, 1999; Campus Activities and Event, 2006; Clemes et al., 2013; Clemes et al., 2008; Clubs and Organisations, 2006; Ford et al., 1999; Huang & Chang, 2004; Joseph et al., 2005; Moore et al., 1998; Yin & Lei, 2007). The pre-test, and the CFA confirmed the suitability of the items and scales adapted from these studies. The items are listed in Table 4-4.

Table 4-4 Measurement Items for Measuring Social Factors Quality

	NO.	Item	Source
Social Factors Quality (5 Items)	SFQ 1	I am offered an opportunity to participate in a variety of extra-curricular activities to share my own interests with others.	Athiyaman (1997) Austin (1984) Austin (1999) Campus Activities and Event (2006) Clemes et al. (2008) Clemes et al. (2013) Clubs and Organisations (2006) Ford et al. (1999) Huang & Chang (2004) Joseph et al. (2005) Moore et al. (1998) Yin & Lei (2007)
	SFQ 2	I enjoy interacting with other students at on-campus social activities.	
	SFQ 3	If my friends attend on-campus social activities, it also encourages me to participate.	
	SFQ 4	The extra-curricular activities offered by the university make me feel good about my university experience.	
	SFQ 5	Attending social practice activities enhances my interaction with other people.	
Overall (2 Items)	SFQO 1	Overall, the quality of my social experience at the university is excellent.	
	SFQO 2	I evaluate my social experience at the university highly.	

4.3.3.5 Section E – Higher Order Constructs

Section E includes a total of 25 items for measuring students' overall perceptions of Service Quality, Student Satisfaction, Student Involvement, University Image, and Student Loyalty. As presented in Table 4-5, there are five items for measuring students' overall perceptions of Service Quality, five items for measuring Student Satisfaction, five items for measuring Student Involvement, five items for measuring University Image, and five items for measuring Student Loyalty.

The items for the student loyalty scale were drawn from Clemes et al. (2008), Clemes et al. (2013), Hu et al. (2009), and Saha and Theingi (2009). The initial items for the service quality construct used in this current study were adapted from scales employed by Clemes et al. (2008), Clemes et al. (2013), Clemes, Shu, et al. (2014), and Saha and Theingi (2009). The measurement items for student satisfaction were based on those developed in studies by Browne et al. (1998), Butt and Rehman (2010), Clemes et al. (2008), Clemes et al. (2013), and Cronin et al. (2000). The items for university image are generated from previous studies (Clemes et al., 2008; Clemes et al., 2013; Kandampully & Suhartanto, 2003). The items for student involvement are generated from previous studies (Astin, 1999; Dunleavy and Milton, 2009; Finn and Rock, 1997; Kuh et al., 2008; Kuh, 2009). The focus group discussions, the pretest and the CFA confirmed the suitability of the items and scales adapted from these studies. The items are listed in Table 4.5.

Table 4-5 Measurement Items for Measuring Service Quality, Student Satisfaction, Student Involvement, University Image, and Student Loyalty

	NO.	Item	Source
Service Quality (5 Items)	SQ 1	The university delivers superior services in every way.	Clemes et al. (2008) Clemes et al. (2013) Clemes, Shu, et al. (2014) Saha & Theingi (2009)
	SQ 2	The services offered by the university always meet my expectations.	
	SQ 3	The university consistently provides high quality services.	
	SQ 4	I think that the service quality offered by the university is excellent.	
	SQ 5	Overall, I am satisfied with the university's service quality.	
Student Satisfaction (5 Items)	SS 1	My choice to be a _____university student is a wise one.	Browne et al. (1998) Butt & Rehman (2010) Clemes et al. (2008) Clemes et al. (2013) Cronin et al. (2000)
	SS 2	I have had a satisfying experience at the university.	
	SS 3	The university provides a satisfying learning experience.	
	SS 4	The university provides a satisfying social life experience.	
	SS 5	I am satisfied with my overall university experience.	
Student Involvement (5 Items)	SI 1	I cut class quite often due to many reasons (e.g. oversleep, other commitments).	Astin (1999) Dunleavy & Milton (2009) Finn & Rock (1997) Kuh et al. (2008) Kuh (2009)
	SI 2	I participate actively in class discussions.	
	SI 3	I spend enough time on study every day (e.g. preview, review, reading academic resources).	
	SI 4	I always complete my assignments on time and independently.	
	SI 5	I use different facilities at the university regularly (e.g. library, computer lab, self-study rooms).	
University Image (5 Items)	UI 1	I have always had a good impression of the university.	Clemes et al. (2008) Clemes et al. (2013) Kandampully & Suhartanto (2003)
	UI 2	In my opinion, the university has a good image in the minds of students.	
	UI 3	The university has a good reputation.	
	UI 4	Generally, the university always fulfils its promises.	
	UI 5	I rate the image of this university highly.	
Student Loyalty (5 Items)	SL 1	I intend to complete my bachelor degree at this university.	Clemes et al. (2008) Clemes et al. (2013) Hu et al. (2009) Saha & Theingi (2009)
	SL 2	This university will be my first choice for my further study.	
	SL 3	I will recommend the university to others.	
	SL 4	I say positive things about the university to others.	
	SL 5	I will encourage friends and relatives to go to the university.	

4.3.3.6 Section F – Demographic Items

Section F (See Appendix 1) includes five items for measuring the demographic characteristics: gender, age, year of study, study major, and average GPA.

4.4 The Method of Data Collection

A face-to-face survey technique was conducted in Shanghai University and Shanghai Normal University campuses in Shanghai to collect the data. First and Third Year university students who were over eighteen years old and first year students who had completed their first semester study and started their second semester study, were asked to fill in the questionnaire as they entered or exited the lecture theatre, and to return the completed questionnaire immediately to the researcher. Respondents were informed that their participation in the study was voluntary and all the information provided would be kept confidential. If respondents had any difficulties in interpreting or understanding the questions, they could ask the researcher for assistance. In addition, Willimack, Schuman, Pennell, and Lepkowski (1995) note that a prepaid non-monetary incentive encourages a high response rate in face-to-face surveys, and they also note that there is no increase in measurement error because of using incentives. Accordingly, incentives were given to the respondents in order to encourage them to participate in this research. Students were told that if they completed and returned their questionnaire to the researcher, they would receive a high quality ballpoint pen or memo as a token of appreciation for participating in the survey.

4.5 Data Screening

Aaker, Kumar, Day, and Lawley (2005) note that how well the data is prepared and converted into a form appropriate for data analysis has an impact on the quality of the statistical analysis. Kline (2005) and Schumacker and Lomax (2004) emphasise the significance of the screening process in order to avoid "messy data" resulting in the failure of the model estimation in SEM. "Messy data" is defined by Schumacker and Lomax (2004, p.240) as *"…missing data, outliers, multicollinearity, and non-normality of data distribution seriously affect the estimation process"*. Therefore, before conducting further data analysis, the collected raw data was screened in order to ensure that only valid data coding and entry were used in the data analysis stage. Invalid questionnaires, for example highly incomplete questionnaires, were excluded from the data analysis.

4.6 Missing Data Remedy

Hair et al. (2010) note that if the missing data is in a random fashion and is under 10% for an individual case or observation, the missing data can generally be ignored. The mean substitution method is considered as one of the most widely used methods to remedy the missing data problem, not only because of its ease in implementation, but also since the mean is the best single

replacement value (Hair et al., 2010). The mean substitution method is also suggested by Schumacker and Lomax (2004) as the most applicable approach for remedying the missing data problem when the missing data accounts for a small proportion of the data set.

4.7 Outlier Detection

Outliers are defined as those observations that are distinctly different from the other observations and are usually the extreme values that have unusually large or small values in a data set (Hair et al., 2010; Anderson, Sweeney, & Williams, 2009). An outlier is judged by Hair et al. (2010, p.64) as *"…an usually high or low value on a variable or a unique combination of values across several variables that make the observation stand out from the others"*. The frequency distributions of standardized residual value or z scores are inspected to identify outliers in this study. Hair et al. (2010) suggest that for a large sample any data value with a standardized residual value of less than -4 or greater than +4 can be identified as an outlier. Therefore, any cases that appeared to be less than -4 or greater than +4 were eliminated from the data set in this study.

Researchers must decide carefully whether to remove or retain outliers from the data set, since Pallant (2010) notes that problematic outliers can distort statistical tests, while their deletion often results in further outlying cases. Anderson et al. (2009) suggest that an outlier can be deleted when it is an observation that should not be included in the database, or it is a data entry error or a mistake in coding. However, an outlier can be retained when it is an observation that has been recorded accurately and represents a valid element of the data set.

4.8 Normality Test

Normality refers to *"the shape of the data distribution for an individual metric variable and its correspondence to the normal distribution"* (Hair et al., 2010, p.71). Skewness and kurtosis are two indications of normality. Skewness refers to the symmetry of a distribution compared with a normal distribution, which is used to describe the balance of the distribution; while Kurtosis refers to the "peakedness" or "flatness" of a distribution compared with a normal distribution, which is used to describe whether the peak of a distribution is taller or shorter than a normal distribution (Hair et al., 2010; Morgan & Griego, 1998).

Field (2009) notes that whether the observed variables are normally distributed in a large sample (200 or more) can be determined by examining the values of the skewness and kurtosis. Moreover, any absolute value of skewness greater than three and any absolute value of kurtosis greater than eight indicates problems with normality in a data distribution (Kline, 2005).

4.9 Data Analysis Techniques

The data collected from the survey was analysed using the software SPSS version 21 and Amos 21. Prior to data analysis, the data screening was completed and the total sample was randomly split into two data sets. The aim of splitting data is to validate the EFA results and to move to SEM analysis (Hair et al., 2010; Kline, 2005; Schumacker & Lomax, 2004). Kline (2005) notes that it is inappropriate to run EFA and CFA using the same data, since sometimes factor structures identified through EFA may have poor model-fit-indices to the same data when evaluated through SEM. Further, Schumacker and Lomax (2004) suggest that a researcher could start model generation by using EFA on a sample of data to identify a plausible model and then employ SEM to confirm the model by using another sample of data. Therefore, two sub-samples were required for this study as two techniques were used in part of the data analysis process: EFA and SEM. A three-stage process was used in order to perform the data analysis. The first stage involved using the first sub-sample data set to conduct EFA and to perform the Cronbach's alpha, which in turn, partially satisfied Research Objective 1. The second stage involved performing CFA using the second sub-sample data set to validate the measurement models developed and to reassess the results of the EFA, which in turn, satisfied Research Objectives 1 to 2. The third stage involved developing and estimating a causal path model on the second sub-sample to test the hypotheses regarding the interrelationships among Service Quality, Student Involvement, Student Satisfaction, University Image, and Student Loyalty discussed in Section 2.8, which in turn, satisfied Research Objective 3.

4.9.1 Exploratory Factor Analysis – Tests and Interpretation

Exploratory factor analysis is identified by Kline (2005, p.71) as *"a class of procedures that include centroid, principal components, and principal axis factor analysis, among many others, that differ in the statistical criteria used to derive factors"*. Schumacker and Lomax (2004, p.155) suggest that *"the researcher explores how many factors there are, whether the factors are correlated, and which observed variables appear to best measure each factor"* in an exploratory factory analysis. EFA offers a better understanding of the factors by providing a data summarization perspective in the early research information gathering stages, and is an appropriate analysis to undertake before SEM (Hair et al., 2010; Pallant, 2010; Kline, 2005; Schumacker & Lomax, 2004). EFA is often used in marketing research to examine dimensional factors (see: Clemes, Shu, et al., 2014; Clemes et al., 2013; Clemes, Gan, et al., 2011; Lu et al., 2009; Dagger et al., 2007). Social Factors has not been identified in the literature and it has been added to the original three primary dimensions of service quality as a fourth primary dimension. Therefore, because of the exploratory nature of this study, an EFA was performed in order to obtain a robust and reliable factor structure of the primary dimensions.

4.9.1.1 Factor Loadings

Factor loadings represent the correlations between the variable and its factor (Hair et al., 2010). Brace, Kemp, and Snelgar (2006) note that the larger absolute value of the factor loadings not only indicates the higher degree of correspondence between variables and factors, but also indicates the more important factor loadings in interpreting the factor matrix. The following three guidelines are provided by Hair et al. (2010) for assessing the significance of factor loadings:

1. Factor loadings in the range of ±0.30 to ±0.40 are considered to meet the minimal level for interpretation of the structure.

2. Loadings ±0.50 or greater are considered practically significant.

3. Loadings exceeding ±0.70 are considered indicative of a well-defined structure and are the goal of any factor analysis.

Table 4-6 Guidelines for Identifying Significant Factor Loadings Based on Sample Size (Hair et al., 2010)

Factor Loading	Sample Size Needed for Significance	Factor Loading	Sample Size Needed for Significance
.30	350	.55	100
.35	250	.60	85
.40	200	.65	70
.45	150	.70	60
.50	120	.75	50

Moreover, the significance of factor loadings is suggested to be dependent on the sample size; the larger the sample size, the smaller the factor loadings are considered to be statistically meaningful (Hair et al., 2010; Field, 2009). In this study, factor loadings were used as the criterion for item reduction in the EFA; those items loading below 0.50, items cross-loading, and item misclassifications were removed from the item pool.

4.9.1.2 Tests for Determining Appropriateness of Exploratory Factor Analysis

Pallant (2010) suggests that prior to performing a factor analysis, researchers need to conduct several investigations so as to ensure that the data matrix has sufficient correlations to justify the application of factor analysis. The investigations include:

1. Examination of the correlation matrix

2. Inspection of the anti-image correlation matrix

3. Bartlett's test of sphericity

4. The Kaiser-Meyer-Olkin measure of sampling adequacy

These investigations are commonly used by researchers to determine whether a data matrix is appropriate for factor analysis (Clemes et al., 2013; Clemes, Shu, et al., 2014).

4.9.1.2.1 Examination of the Correlation Matrix

Hair et al. (2010) note that examining the correlation matrix is a simple method for researchers to use for determining the appropriateness of factor analysis. Correlations in the range of 0.10 to 0.30 are usually suggested verbally as being weak (Hardy & Bryman, 2004).

Factor analysis is considered to be applicable when there are substantial numbers of correlations greater than 0.30 in a data matrix (Pallant, 2010), indicating that the items share common factors and are suitable for factor analysis (Chinna, 2009). Otherwise, the data matrix is considered to be inappropriate for factor analysis.

4.9.1.2.2 Inspection of the Anti-Image Correlation Matrix

Hair et al. (2010) note that the anti-image correlation matrix represents the negative value of the partial correlation. A partial correlation is suggested as an unexplained correlation when the effects of other variables are taken into account. High partial correlations indicate that there are no sufficient underlying factors; thus, factor analysis is inappropriate (Hair et al., 2010; Brace et al., 2006). Small anti-image correlations are indicative of a data matrix that is suitable for factor analysis (Field, 2009; Tabachnick & Fidell, 2007), while large anti-image correlations indicate that a data matrix is inappropriate for factor analysis (Hair et al., 2010).

4.9.1.2.3 Bartlett's Test of Sphericity

Hair et al. (2010) suggest that Bartlett's test of sphericity is a statistical test for the presence of correlations among the variables, and thus, examines whether a correlation matrix has significant correlations among at least some of the variables (Hair et al., 2010; Hinton, Brownlow, & McMurray, 2004). When Bartlett's test of sphericity is statistically significant (sig. < 0.05), sufficient correlations are suggested to exist among the variables to carry on with factor analysis in a data matrix. Otherwise, the data matrix is inappropriate for factor analysis (Pallant, 2010; Hinton et al., 2004).

4.9.1.2.4 Kaiser-Meyer-Olkin Measure of Sampling Adequacy

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is an index that provides a measure for determining whether the variables belong together and quantifies the degree of intercorrelations among the variables (Stewart, 1981). KMO ranges from 0 to 1; when KMO reaches 1, the variables are considered to be perfectly predicted without error by the other variables. The guidelines for using KMO to determine whether a data matrix is appropriate for factor analysis are: if the value is 0.90 or above it is marvellous; 0.80 or above meritorious; 0.70 or above middling; 0.60 or above mediocre; 0.50 or above miserable; and below 0.50 unacceptable (Kaiser & Rice, 1974). Chinna (2009) also suggests that KMO values should be above 0.50 to indicate appropriateness for factor analysis.

4.9.1.3 Factor Extraction in Principal Components Analysis

Pallant (2010) notes that factor extraction aims to extract the smallest number of factors that can be used to best represent the interrelationships among a set of variables. The decision regarding determining the number of extracted factors can be a knotty issue and generates more argument and misunderstanding than any other issue regarding factor analysis (DeVellis, 2012; Stewart, 1981). The following three criteria are commonly used by researchers for factor extraction (Hair et al., 2010; Lawrence, Gamst, & Guarino, 2013):

1. Eigenvalues or the latent root criterion
2. Percentage of variance criterion
3. Scree test criterion

4.9.1.3.1 Latent Root Criterion

Hair et al. (2010) note that the latent root criterion is the most commonly used technique for selecting the number of factors. The rationale of latent root criterion is that *"any individual factor should account for the variance of at least a single variable if it is to be retained for interpretation"* (Hair et al., 2010, p.109). Each variable contributes a value of 1 to the total eigenvalue, but only the factors with eigenvalues or latent roots greater than 1 are considered significant and retained (Hair et al., 2010; Hardy & Bryman, 2004). Hair et al. (2010) also suggest that the latent root criterion or eigenvalue is most applicable when the number of variables is between 20 and 50 in the factor analysis.

4.9.1.3.2 Percentage of Variance Criterion

The purpose of percentage of variance criterion is to ensure practical significance for the derived factors by ensuring that they explain at least a specified amount of total variance (Hair et al., 2010).

Hair et al. (2010) suggest that in the social sciences, it is common to consider a solution that accounts for 60% of the total variance as satisfactory.

4.9.1.3.3 Scree Test Criterion

Hair et al. (2010) suggest that the scree test criterion is derived by plotting the latent roots against the number of factors in their order of extraction, and the cut-off point is evaluated by the shape of the resulting curve. Osborne and Costello (2005) note that the scree test involves examining the graph of the eigenvalues and finding the cut-off point. The procedure for the scree test is explained as follows: *"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"* (Stewart, 1981, p.58).

4.9.1.4 Factor Rotation

The purpose of factor rotation is to make the factor structure more interpretable when the dimensions are rotated (Aaker et al., 2005); thus, to achieve simpler and more meaningful factor solutions (Osborne & Costello, 2005). Orthogonal factor rotation and oblique factor rotation are two types of factor rotation methods used by researchers in the computations for EFA (Bryman & Cramer, 2005). Both factor rotation methods were adopted in this study, but the final factorial structure was based on the VARIMAX rotation results.

4.9.1.4.1 Orthogonal Rotation

Orthogonal rotations require the rotation process to keep the factors uncorrelated (Bryman & Cramer, 2005; Pallant, 2010). Tabachnick and Fidell (2007) suggest that the output of an orthogonal rotation is easier to interpret. QUARTIMAX, VARIMAX, and EQUIMAX are the three major orthogonal approaches (Hair et al., 2010; Larose, 2006).

The QUARTIMAX rotation aims to simplify the rows of a factor matrix by focusing on rotating the initial factor so that a variable loads high on one factor and as low as possible on all the other factors (Hair et al., 2010; Larose, 2006). However, Meyers, Gamst, & Guarino (2013) note that the QUARTIMAX method is infrequently used by researchers, since the QUARTIMAX method has not proved very successful in producing simpler structures (Hair et al., 2010).

The VARIMAX rotation focuses on simplifying the columns of the factor matrix (Hair et al., 2010; Larose, 2006). The logical interpretation of the VARIMAX method is explained by Hair et al. (2010, p.115) as follows: *" when the variable-factor correlations are (1) close to either +1 or -1, thus indicating a clear positive or negative association between the variable and the factor, or (2) close to 0, indicating a clear lack of association"*. Hair et al. (2010) note that the VARIMAX method has proved

successful in obtaining an orthogonal rotation of factors, and has been the most frequently used factor rotation method (Meyers et al., 2013).

The EQUIMAX rotation is a compromise between the QUARTIMAX and VARIMAX methods (Hair et al., 2010; Larose, 2006; Meyers et al., 2013). However, Hair et al. (2010) note that the EQUIMAX approach has not gained widespread acceptance and is used infrequently.

4.9.1.4.2 Oblique Rotation

Oblique rotations and orthogonal rotations often result in similar solutions, but the output of an oblique rotation is more difficult to interpret since oblique rotations do not require the rotation process to maintain independence between the rotated factors (Hair et al., 2010; Meyers et al., 2013; Tabachnick & Fidell, 2007). Pallant (2010) suggests that researchers could conduct both oblique rotations and orthogonal rotations and select the best results for interpretation. Therefore, an oblique rotation was also undertaken in this study, but the VARIMAX rotation results were used for the final interpretation, since the output of an oblique rotation is more difficult to interpret (Tabachnick & Fidell, 2007).

4.9.1.5 Unidimensionality Analysis

Bernard (2000) suggests that a measurement scale is unidimensional when there is a single factor that underlies all the items and all items load on that single factor. Hair et al. (2010) suggest that the test of unidimensionality is that each summated scale should consist of items loading highly on a single factor. Items that highly loaded on more than one factor were eliminated in order to ensure adequate unidimensionality in this study.

4.9.1.6 Reliability and Validity

Schumacker and Lomax (2004) note that reliability is concerned with the ability of a measure to generate consistent results. Hair et al. (2010, p.125)) note that reliability *"… is an assessment of the degree of consistency between multiple measurements of a variable"*. Cronbach's coefficient alpha is suggested as the most widely used measure for examining the scale reliability (Hair et al., 2010; Kline, 2011). The generally acceptable limit for a Cronbach's alpha score is 0.70 or higher (Hair et al., 2010; Nunnally & Bernstein, 1994). A Cronbach's alpha score higher than 0.80 is interpreted as extremely reliable (Churchill, 1979).

Validity is defined by Pallant (2010) as the degree to which a scale measures what it should measure. Content validity, also known as face validity, is the most widely accepted form of validity for measuring construct validity (Hair et al., 2010; Kline, 2011; Schall, 2003). The objective of content validity is *"… to ensure that the selection of scale items extends past just empirical issues to also include theoretical and practical considerations"* (Hair et al., 2010, p.125). When a measurement

instrument provides adequate representation of the concept that it is supposed to measure, the measurement instrument is considered to display content validity (Churchill, 1979). McDaniel and Gates (1998) also suggest that a measurement instrument has face validity when the measurement instrument appears to measure what it is intended to measure.

4.9.2 Structural Equation Modelling

When comparing SEM with multiple regression analysis, it is worthwhile to consider some benefits that SEM provides relative to multiple regression analysis: (1) SEM provides more flexible assumptions, particularly allowing interpretation even in the face of multicollinearity; (2) SEM has a superior ability to handle difficult data, such as non-normal data and incomplete data; (3) SEM uses CFA (having multiple indicators per latent variable) to reduce measurement error; (4) SEM has the desirability in testing models overall rather than coefficients individually; and (5) SEM possesses the ability to model mediating variables and error terms, as well as to test models with multiple dependents. Moreover, SEM has the ability to depict and test all of the relationships among the constructs (the dependent and independent variables) involved in the analysis, even when the dependent variable becomes an independent variable in other relationships (Byrne, 2010; Chinna, 2009; Hair et al., 2010).

Several authors claim that statistical techniques such as multiple regression analysis have specific limitations since multiple regression analysis assesses only a single relationship between the independent and dependent variables and therefore, SEM should be employed in various research settings (Chen et al., 2011; Hair et al., 2010; Rahman, Haque, & Ahmad, 2010; Ryu & Han, 2010; Ryu et al., 2008; Ullman, 2006; Yap & Kew, 2006). Hair et al. (2010) believe that with adequate theoretical support, SEM can be used by researchers as a powerful analytical tool for studying complex relationships in many fields. SEM is claimed by Ryu et al. (2008) to be a prominent alternative method for investigating a higher-order structure, while Tabachnick and Fidell (2007, p.679) maintains that *"when the phenomena of interest are complex and multidimensional, SEM is the only analysis that allows complete and simultaneous tests of the relations"*. Therefore, SEM was employed in this study based on the noted limitations of multiple regression analysis and the advantages of SEM.

Partial least squares (PLS) is becoming a widely used approach to estimate path models in operations management, psychology, business, and social sciences research (Hair et al., 2010; Peng & Lai, 2012; Willaby, Costa, Burns, MacCann, & Roberts, 2015) and is an alternative to SEM. As noted by Hair et al. (2010), conceptually and practically, PLS is more of a "regression-based" approach and is similar to multiple regression analysis when used to examine possible relationships with less emphasis on the measurement model.

When compared to SEM, PLS is more robust with fewer identification issues (single-item measures or a mix of several single- and two-item measures), works with a smaller sample size, and can handle both formative and reflective constructs (Hair et al., 2010; Willaby et al., 2015). However, there are disadvantages with PLS: 1) the focus of PLS is on prediction of the constructs rather than an explanation of the relationships between items; 2) bias in parameter estimates; 3) inability to model measurement errors; 4) piecemeal approach to estimating the overall research model; 5) not providing a test of theoretical fit (Hair et al., 2010; Peng & Lai, 2012; Willaby et al., 2015).

Furthermore, PLS is not recommended as an alternative to SEM with the increasing concern for good measurement quality and latent constructs with multi-item measures. Although PLS can produce results with a very small sample, the generalizability of these results is limited by the small sample (Hair et al., 2010). Willaby et al. (2015) note that PLS is often used in an exploratory research context whereas SEM is often used in a confirmatory research context.

SEM is more concerned with explanation and is a more appropriate tool for theory testing (Hair et al., 2010). Thus, SEM was employed in this study based on the noted disadvantages of PLS, the confirmatory nature of the research and the testing of theory.

Hair et al. (2010, p.634) define SEM as *"a family of statistical models that seek to explain the relationships among multiple variables"*. SEM is also known by many names: covariance structure analysis, latent variable analysis, path analysis, confirmatory factor analysis; and sometimes SEM is referred to by the name of the specialized software package used, for example, LISREL and AMOS (Byrne, 2010; Hair et al., 2010). The development of SEM began in the early 1950s when economic researchers desired to establish causal relationships between variables. However, the mathematical complexity of SEM limited the application of SEM until the availability and wide use of computers and software became available (Blunch, 2008; Byrne, 2010; Kline, 2005). Currently, Hair et al. (2010, p.642) explain that SEM is *"the dominant multivariate technique and the application is widely being published in the academic social science literature"*.

A structural equation model was employed in this current study to examine the causal relationships among the latent variables (Service Quality, Student Satisfaction, Student Involvement, University Image, and Student loyalty).

A number of academics report several advantages of using the AMOS software (Blunch, 2008; Byrne, 2010; Chinna, 2009; Hair et al., 2010), and note, AMOS can help new users handle the statistical analysis and organise their work more easily. Thus, AMOS was chosen as the SEM software for this study. The advantages of AMOS are reported as follows:

- User-friendly;
- No need to write any computer code, the researcher can perform the analysis directly from a path diagram model;
- Has a basic programming interface as an alternative to graphics;
- AMOS software is available as an addition to the SPSS software package;
- The researcher can organise the output since the output was developed within the Microsoft Windows interface.

4.9.2.1 Two-Step Approach

In the literature, there is a one-step approach and a two-step approach for conducting SEM. The two-step approach proposed by Anderson and Gerbing (1988) that separates the measurement model assessment from the structural model assessment was used to perform SEM in this study. The first step in the two-step approach is to test the fit and construct validity of the proposed measurement model, and the second- step is to test the structural theory once a satisfactory measurement model is obtained. Therefore, the measurement model fit provides a basis for assessing the validity of the structural theory (Hair et al., 2010).

Researchers often start their studies by specifying a model, while a model is usually considered as the representation of a theory in this context. Hair et al. (2010, p.637) state that theory *"can be thought of as a systematic set of relationships providing a consistent and comprehensive explanation of phenomena"*. Moreover, in this study the items measuring the construct are represented as reflective indicators. Thus, the direction of the arrows is drawn from the latent constructs to the measured items, which are assumed to be caused by underlying factors and their measurement errors (Chinna, 2009; Kline, 2005).

Jöreskog and Sörbom (1993) state that the measurement model should be tested before the structural relationships are tested, otherwise the testing of the structural model may be meaningless. Thus, the measurement model and the structural model were developed and estimated separately in this study, as suggested by Jöreskog and Sörbom (1993). Therefore, the measurement model was developed and estimated first before the structural model. Details of the measurement model and the structural model are discussed in the following subsections.

4.9.2.2 Measurement Model

The measurement model is the first half of a SEM model that deals with the relationships between the latent variables and their observed indicators. Moreover, the measurement model enables

researchers to assess how well the observed indicators work as a measurement instrument for the latent variables (Blunch, 2008; Byrne, 2010; Chinna, 2009). Jöreskog and Sörbom (1993) claim that the measurement models should be developed and estimated prior to the structural equation model. CFA is known in the SEM literature as a technique that is used to assess the measurement model (Gallarza & Gil-Saura, 2006; Hair et al., 2010). 54 items used to measure nine latent constructs were subjected to CFA to verify unidimensionality and convergent validity in this study.

Specifically, six separate measurement models were analysed. There were four proposed primary dimensions comprising the first four measurement models (see Figures 4-1 to 4-4), followed by the overall primary dimensions measurement model (see Figure 4-5) and the causal path model (see Figure 4-6).

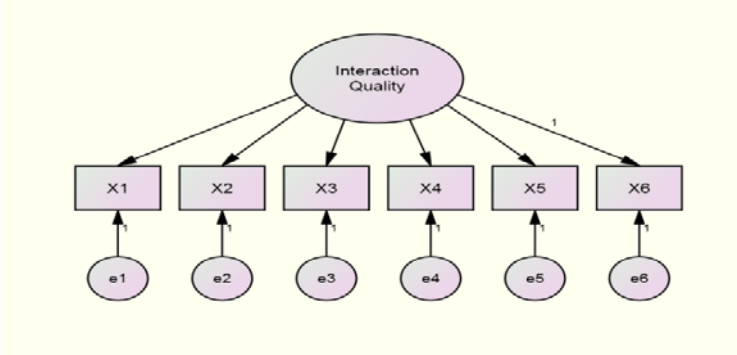


Figure 4-1 Measurement Model 1 – Interaction Quality

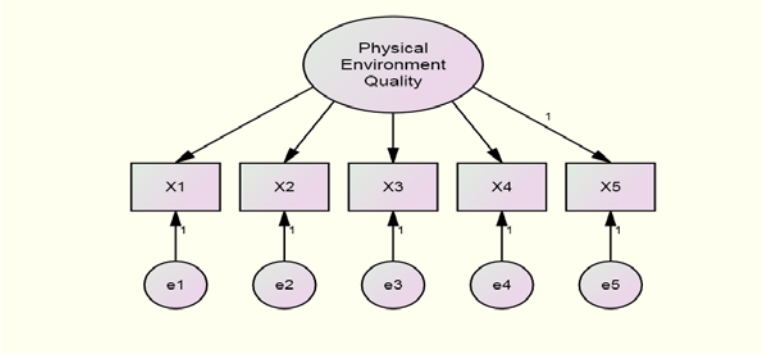


Figure 4-2 Measurement Model 2 – Physical Environment Quality

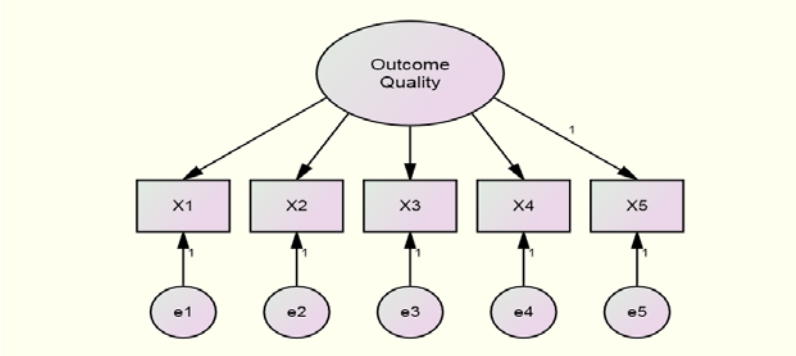


Figure 4-3 Measurement Model 3 – Outcome Quality

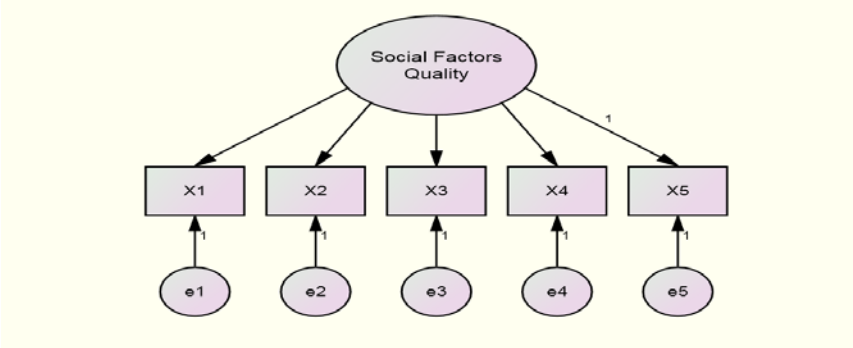


Figure 4-4 Measurement Model 4 – Social Factors Quality

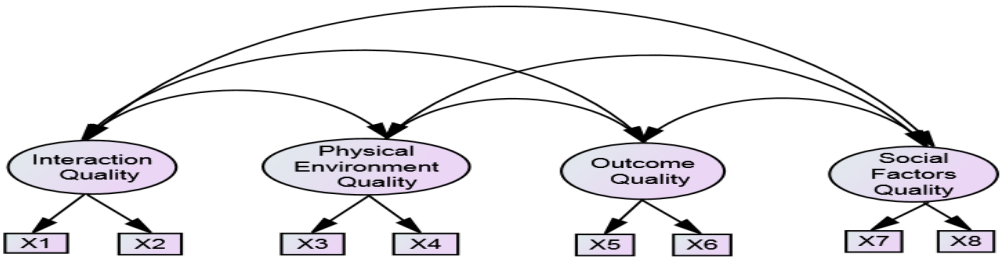


Figure 4-5 Measurement Model 5 – Primary Dimensions

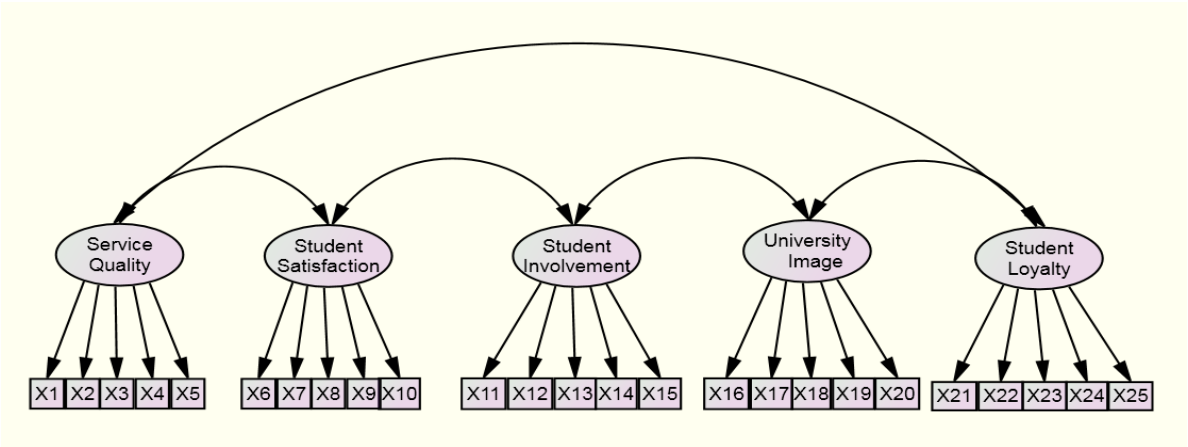


Figure 4-6 Measurement Model 6 – Causal Path

4.9.2.2.1 Model Specification

Schumacker and Lomax (2004) suggest that the aim of model specification is to use all of the available relevant theories and information to develop a theoretical model. Kline (2005) suggests that model specification involves determining every relationship and parameter in the research model. A review of prevailing empirical literature on Service Quality, Student Satisfaction, University Image, Student Involvement, Student Loyalty (Chapter Two), and the findings of the EFA were used

to specify the measurement models and structural models in this current study. In addition, the models specified in this study satisfied the assumptions of Byrne (2010) and Mueller (1996) and they are as follows:

1. The first of each measured item is set to 1.0, while all other factor loadings are either freely estimated on a specific factor or fixed to zero on other factors.

2. All covariance parameters are correlated and freely estimated in the first-order CFA, while covariations among the first-order factors are fully explained by their regression on the higher-order factor in the second-order CFA.

3. Error terms related to each measured item are uncorrelated.

4.9.2.2.2 Model Identification

Diamantopoulos and Siguaw (2000) note that model identification is if one has sufficient information to derive a unique solution for the parameters to be estimated in a model. Kline (2005) suggests that a model is usually identified if it is theoretically possible to obtain a unique estimate of each parameter.

There are three levels of model identification: under-identified model, just-identified model, and over-identified model (Byrne, 2010; Diamantopoulos & Siguaw, 2000; Hair et al., 2010; Kline, 2005; Schumacker & Lomax, 2004). Byrne (2010) suggests that a CFA model is under-identified when there are more parameters to be estimated than the items of variance and covariance (negative df). An under-identified model indicates that a model has not sufficient information to estimate all model parameters.

A CFA model is just-identified when there are just enough numbers of variances and covariances to estimate all parameters in the model, or zero df. A just-identified model indicates that there is just enough information to estimate all model parameters. A CFA model is over-identified when the number of variances and covariances are more than the parameters to be estimated in the model (positive df). An over-identified model indicates that there is more than just enough information to estimate all model parameters (Byrne, 2010).

The t-rule is known as the procedure for determining model identification in SEM (Blunch, 2008; Byrne, 2010). The t-rule compares the number of measured items (υ+1)/2 (where υ is the pieces of information) with the total number of estimated parameters in the model. The t-rule refers to the requirement that the pieces of information must be at least equal to or greater than the estimated parameters for any model. A CFA model is identified when the t-rule is satisfied (Byrne, 2010). Hair et al. (2010) suggest that the identified model can be characterized by the degrees of freedom (df)

after all the parameters to be estimated are specified. Blunch (2008, p.73) notes that *"the more df the more precise the estimation and the more powerful the test"*.

4.9.2.2.3 Model-Fit-Indices

A specified model is supported by the sample data when the model has a good fit (Schumacker & Lomax, 2004). The fit of a specified model to the sample data can be assessed using several model fit indices, and Schumacker and Lomax (2004, p.100) note that the purpose of the analysis of model-fit-indices procedure is *"… to determine the degree to which the sample variance-covariance data fit the SEM"*.

Numerous model-fit-indices are evident in the literature: Normed chi-square ($\mathcal{X}^2/df$), Goodness-of-fit index (GFI), Root mean residual (RMR), Comparative fit index (CFI), Normed fit index (NFI), and Root mean square error of approximation (RMSEA) (Chinna, 2009; Hair et al., 2010; Kline, 2005; Nokelainen, 2009; Schumacker & Lomax, 2004). Hair et al. (2010) suggest that using three to four model-fit-indices provides adequate evidence of model fit, and the researcher does not need to report all of these indices because of the redundancy among them. In addition to the $\mathcal{X}^2$ value and the associated df, at least one incremental index (such as NFI and CFI) and one absolute index (such as RMR, RMSEA, and GFI) should be reported by the researcher (Hair et al., 2010). The model-fit-indices used in this study are based on the recommendations by several authors (Chinna, 2009; Hair et al., 2010; Kline, 2005; Nokelainen, 2009; Schumacker & Lomax, 2004) and are explained in detail as follows:

1. Normed Chi-square

The normed chi-square ($\mathcal{X}^2/df$) is a simple ration of ($\mathcal{X}^2$) to the degrees of freedom (df) for a model. $\mathcal{X}^2$ is a statistical measure that quantifies the differences between the observed and estimated covariance matrices. df is the amount of information available to estimate the sampling distribution of the data (Hair et al., 2010). A normed chi-square ratio ($\mathcal{X}^2/df$) of less than 3.0 generally indicates an excellent model fit (Kline, 2005). Schumacker and Lomax (2004) maintain that a $\mathcal{X}^2/df$ value of up to 5.0 is considered as a relative fit; a value less than 1.0 is considered as a poor model fit; more than 5.0 reflects a need for improvement.

2. Goodness-of-fit Index

The Goodness-of-fit index (GFI) is an absolute fit measure indicating how well a specified model reproduces the observed covariance matrix among the indicator variables (Hair et al., 2010). GFI was an early attempt to produce a fit statistic that was less sensitive to sample size. However, Hair et al. (2010) note a decline in usage of the GFI because of the recent development of other fit indices. The

threshold for GFI is greater than 0.90, with higher values indicating a better fit (Byrne, 2010; Chinna, 2009; Hair et al., 2010; Kline, 2005).

3. Root Mean Square Residual

Schumacker and Lomax (2004) suggest that the root mean square residual index (RMR) uses the square root of the mean-squared differences between matrix elements in S and ∑. Kline (2005) suggests that a RMR of less than 0.10 is considered favourable.

4. Comparative Fit Index

Kline (2005) suggests that the comparative fit index (CFI) is one of the classes of fit statistics most widely used in SEM, and the CFI is a measure that quantifies the relative improvement in the model fit compared to an independent model. Hair et al. (2010) suggest that the CFI is an incremental fit index that is an improved version of the normed fit index. The threshold for CFI is greater than 0.90, with higher values indicating a better fit (Byrne, 2010; Chinna, 2009; Hair et al., 2010; Kline, 2005).

5. Normed Fit Index

Hair et al. (2010) note that the normed fit index (NFI) is one of the original incremental fit indices, and the NFI is a measure that quantifies the differences in the $\mathcal{X}^2$ value for the fitted model and an independent model, divided by the $\mathcal{X}^2$ value for the independent model. However, one disadvantage of the NFI is that for those more complex models, they will necessarily have a higher index value and will artificially inflate the estimation of the model fit. Therefore, the NFI is used less now. The threshold for NFI is greater than 0.90, with higher values indicating a better model fit (Byrne, 2010; Chinna, 2009; Hair et al., 2010; Kline, 2005).

6. Root Mean Square Error of Approximation

Hair et al. (2010) suggest that the root mean square error of approximation (RMSEA) is a measure that represents how well a model fits a population. Nokelainen (2009) notes that the RMSEA is designed to evaluate the approximate fit of the model of the respondents. A lower value RMSEA indicates a better model fit, and the thresholds for RMSEA are suggested by Nokelainen (2009) and Ullman (2006) as follows: values less than 0.05 ‘close fit’, values between 0.05-0.08 ‘fair fit’, values between 0.08-0.10 ‘mediocre fit’, and values greater than 0.10 ‘poor fit’.

Table 4-7 Model Fit Indices and Recommended Thresholds

Model-Fit-Indices	Recommended Thresholds
χ^2/df	Less than 3.0
GFI	0.90 or larger
RMR	0.10 or less
CFI	0.90 or larger
NFI	0.90 or larger
RMSEA	0.08 or less

4.9.2.2.4 Model Modification

Byrne (2010) notes that the purpose of model modification is to identify any misspecification that exists in the model in order to improve the overall model fit to the sample data. Since the main source of misspecification occurs in the measurement model, model modification occurs mostly in the measurement model rather than in the structural model (Schumacker & Lomax, 2004). Most model modification is by way of model trimming that involves deleting one path or measured item at a time (Chinna, 2009). Hair et al. (2010, p.733) emphasize that model modification *"… must always be done with theoretical support rather than just empirical justification"*. Similarly, Chinna (2009) also notes that it is important for model modification to be done only if it is consistent with the theoretical insights, the researcher's judgement, and the modification makes statistical sense.

There are two types of diagnostic measures that can be used to perform model modification. First, Modification Indices (MI) may be used (Jasnssens, De Pelsmacker, Wijnen, & Van Kenhove, 2008). Small MIs indicate a good model fit, since a large MI indicates that a model fit can be improved by freeing a corresponding path (Hair et al., 2010). The utilization of the MI is usually associated with an interpretation of the Expected Paramater Change Statistics (EPCs) (Schumacker & Lomax, 2004). Second, standardized residuals are used to identify model misspecifications. Standardized residual values larger than the critical value of 2.58 suggest a possible model misfit (Byrne, 1998; Diamantopoulos & Siguaw, 2000; Janssens et al., 2008). Schumacker and Lomax (2004) suggest that large standardized residuals (> 2.58), indicate a particular variable relationship is not well accounted for in the model.

4.9.2.2.5 Unidimensionality Analysis

The unidimensionality of the measure is suggested as a prerequisite for assessing construct validity and reliability (Anderson & Gerbing, 1991). Byrne (1994) and Byrne (2010) suggest that there is strong evidence of unidimensionality for a model when a CFI is 0.90 or above.

4.9.2.2.6 Construct Validity and Reliability of the Measurement

Construct reliability (CR), also known as composite reliability, was used to assess the reliability of the measurement instrument in this current study. Hair et al. (2010) note that composite reliability aims to measure the reliability of the internal consistency of the measured items representing a latent construct, and must be established before assessing construct validity. Chinna (2009) suggests that composite reliability should be at least 0.70 to suggest good reliability and to indicate that internal consistency exists. However, a composited reliability value of between 0.60 and 0.70 may be acceptable, providing other indicators of a model's construct validity are good (Hair et al., 2010). The CR is computed by the following formula:

Equation 4-1 Composite Reliability

$$\text{Composite Reliability} = \frac{(\sum standardized\ loadings)^2}{(\sum standardized\ loadings)^2 + \sum measurement\ errors}$$

Source: Janssens et al. (2008, p.307)

4.9.2.2.7 Convergent Validity

Janssens et al. (2008, p.306) note that convergent validity indicates *"the degree to which two different indicators of a latent variable confirm one another"*. Hair et al. (2010, p.126) note that convergent validity assesses *"the degree to which two measures of the same concept are correlated".* The convergent validity was assessed by using factor loadings and the average variance extracted (AVE) in this study. In order to have strong evidence of convergent validity, standardized factor loadings must be statistically significant (t-value > 1.96) (Anderson & Gerbing, 1988), and factor loadings must be above a recommended cut-off point of 0.60 (Bagozzi & Yi, 1988). When factor loadings are lower than 0.50, the measured items are suggested to have a high potential for being deleted from the research model (Anderson & Gerbing, 1988; Hair et al., 2010; Janssens et al., 2008). Moreover, convergent validity assessed by examining the AVE as AVE is a summary indicator to see if convergence validity exists. Hair et al. (2010) suggest that a model is said to have adequate convergence when an AVE is 0.50 or higher, whereas an AVE of less than 0.50 indicates that, on average, more error remains in the items than the variance explained by the latent factor structure imposed on the measure. The AVE is computed by the following formula:

Equation 4-2 Average Variance Extracted

$$\text{AVE} = \frac{\sum(standardized\ loadings)^2}{\sum(standardized\ loadings)^2 + \sum measurement\ errors}$$

Source: Janssens et al. (2008, p.309)

4.9.2.2.8 Discriminant Validity

Hair et al. (2010, p.126) define discriminant validity as *"… the degree to which two conceptually similar concepts are distinct"*. Kline (2005) suggests that discriminant validity can be assessed by investigating the correlation coefficients between different constructs. Correlation coefficients between the constructs of less than 0.85 are considered as indicative of acceptable discriminant validity, while correlation coefficients exceeding 0.85 can indicate multicollinearity (Kline, 2005). Thus, when a correlation coefficient exceeds 0.85, the measured items from one of the two constructs should be deleted.

4.9.2.3 Structural Model

Once the measurement model was confirmed, the structural model was constructed. The structural model is also known as the path model that relates the independent variables to the dependent variables. A path model is produced when a figure shows a structural model pictorially. Byrne (2010) and Chinna (2009) note that paths are often represented by straight lines with arrowheads pointing towards the affected variable.

Eight separate structural models were analysed in this study. The first four models were designed to test the relationship between the four primary dimensions and their measured items (Figures 4-7 to 4-10). The second model was intended to test the relationships between the four primary dimensions (Interaction Quality, Physical Environment Quality, Outcome Quality and Social Factors Quality) and Service Quality (Figure 4-11). The third model was designed to test the causal path model as a method of investigating the interrelationships among Service Quality, Student Satisfaction, Student Involvement, University Image, and Student Loyalty (Figure 4-12). The last three models were designed to analyse the mediating effect of Student Satisfaction and Student Involvement (Figure 4-13 and 4-14).

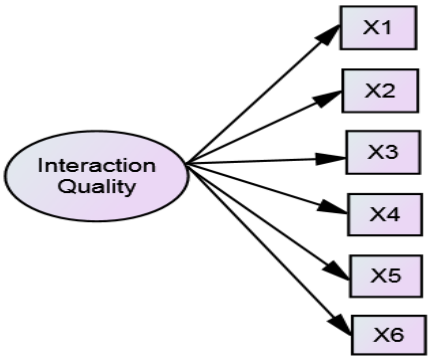


Figure 4-7 Structural Model 1 – Model for Interaction Quality

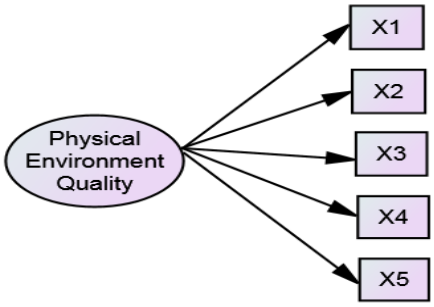


Figure 4-8 Structural Model 2 – Model for Physical Environment Quality

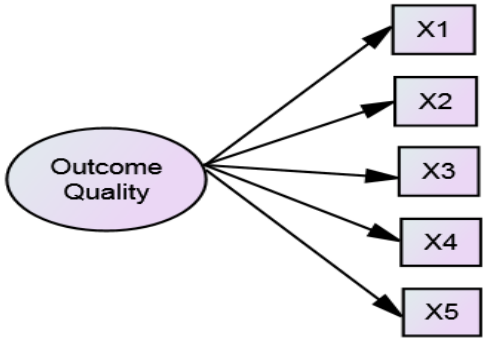


Figure 4-9 Structural Model 3 – Model for Outcome Quality

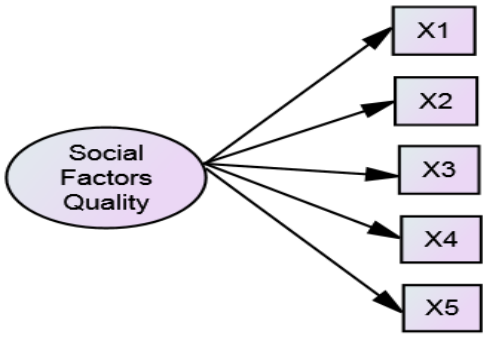


Figure 4-10 Structural Model 4 – Model for Social Factors Quality

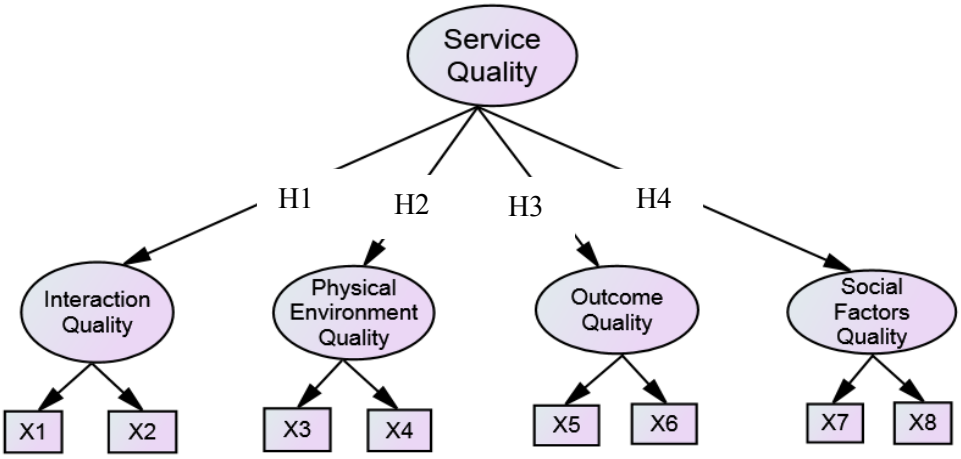


Figure 4-11 Structural Model 5 – Primary Dimensions

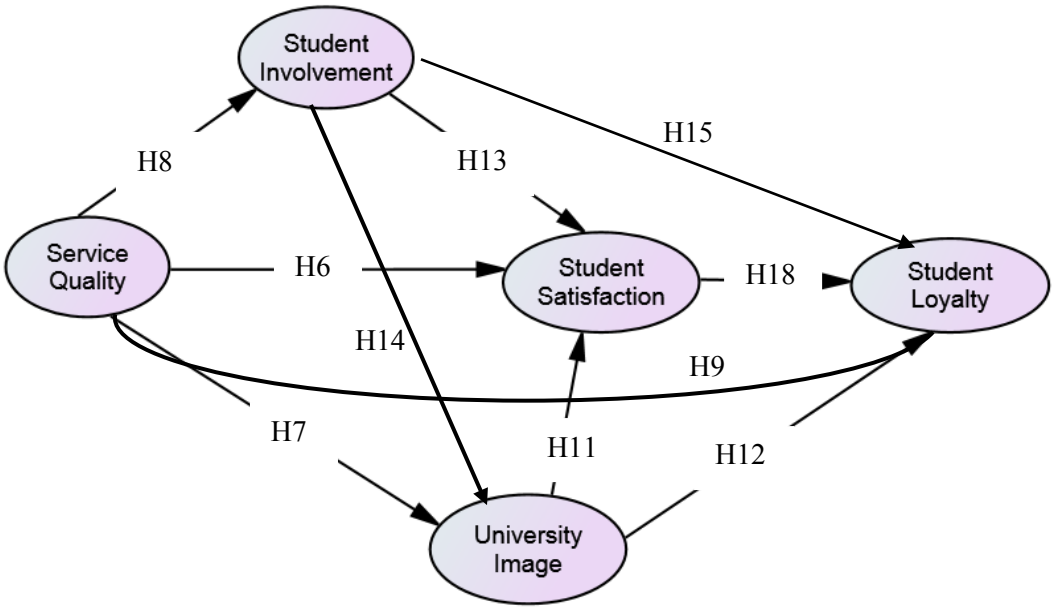


Figure 4-12 Structural Model 6 – Causal Relationships

Figure 4-13 Structural Model 7 – Mediating Effect of Student Satisfaction

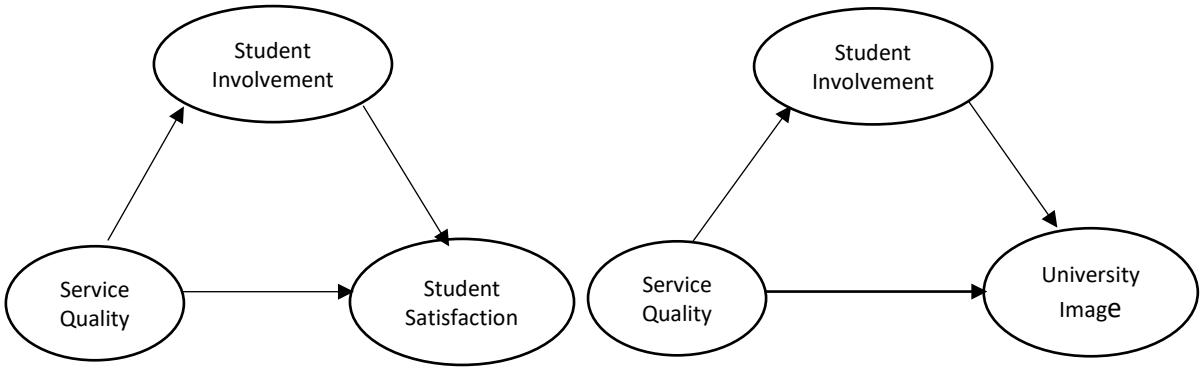


Figure 4-14 Structural Model 8 and Structural Model 9 – Mediating Effect of Student Involvement

Byrne (2010) notes that the objective of assessing the first-order model is to test the correspondence between the first-order latent factors and measured items; while the objective of assessing the second-order model is to test whether the second-order latent variable is a multidimensional construct composed of multiple first-order factors that are explained by their corresponding measured items. In addition to first-order models and second-order models, the model-fit-indices were also examined in order to assess the model fit. Bagozzi & Yi (1988) suggest that a similar set of model-fit-indices used to examine the measurement model should also be used to examine the structural model. Therefore, evidence of a good model fit is provided by comparing all model-fit-indices with their corresponding recommended thresholds (Table 4.7). Once a satisfactory structural model was produced, hypothesis testing was conducted. The hypothesis is supported if the C.R. is statistically significant at the 0.05% level (critical ration = *t-value* > 1.96) (Hair et al., 2010).

Chapter 5

Results

This chapter presents the results of the analyses based on the data analysis procedures discussed in Chapter 4, and discusses the findings of this study. The data set was examined to ensure the appropriateness for EFA and SEM. The data set was randomly divided into two sub-samples: Sample One and Sample Two. Sample One (120 sample size) was subjected to EFA. Sample Two (250) was subjected to SEM. Twenty hypotheses were tested to satisfy the four research objectives. The summarized results of the data analysis are presented in Tables (see 5-1 to 5-89) and illustrations of models are illustrated in Figures (see 5-1 to 5-29).

5.1 Response Rate and Respondents' Profiles

5.1.1 Sample and Usable Responses

The questionnaires were distributed in Shanghai Normal University and Shanghai University. A total of 420 university students were asked to participate the survey; 385 respondents filled out the questionnaires. This resulted in a 91.67% response rate. Fifteen questionnaires (partly filled out) were excluded from the data analysis since they were incomplete. This resulted in a total of 370 useable responses, and an 88.1% usable response rate. Since the missing data was missing in a random fashion, and only accounted for a very small proportion of the sample data, the mean substitution method was used for the missing data remedy (Hair et al., 2010; Schumacker & Lomax, 2004). In addition, the 370 useable responses were randomly divided into two sub-samples: Sample One and Sample Two. Sample One contained 120 useable responses and Sample Two contained 250 useable responses. The size of Sample One met the minimum sample size of 120 as suggested by Hair et al. (2010) for EFA. The size of Sample Two was above the minimum sample size of 200 as suggested by Boomsma (1983) and Kelloway (1998) for SEM. Therefore, the two sub-sample sizes were deemed to be acceptable for the purpose of this research.

5.1.2 Non-response Bias

5.1.2.1 Early/Late Response

The generalizability of the research results of this study can be affected by non-response bias (Armstrong & Overton, 1977; Churchill, 1979; Linder et al., 2001). Moreover, some researchers point out that non-response bias is a source of error in sample estimates (Dillman, 2000; Linder et al., 2001). Therefore, this bias can be a serious problem in data collection method using convenience sampling (Kumar, Aaker, & Day, 1999; Yu & Cooper, 1983). Armstrong and Overton (1977) suggest

that non-response bias can be estimated by using the extrapolation method. The assumption of the extrapolation method is identified by Armstrong and Overton (1977, p.397) as *"a subject who has responded less readily is more like a non-respondent."*

In this study, 175 questionnaires were collected between 20th April to 31st May 2013, and the other 195 questionnaires were collected between 1st June to 20th July 2013. The data in Table 5-1 shows the mean scores for the sum of the primary dimensions, the Service Quality items, the Student Satisfaction items, the Student Involvement items, the University Image items, and the Student Loyalty items of the two groups. Independent t-tests were conducted to determine whether the group means were statistically significant. The results reported in Table 5-1 indicated that the equal variance significance values for all constructs were greater than the 0.05 level of significance between the two groups (Pallant, 2010), thus providing no evidence of non-response bias in this study.

Table 5-1 Independent Sample Test for Non-response Bias

Construct	Levene's Test for Equality of Variances		T-test for Equality of Means Significant at 5%				
	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
IQ	3.172	.076	1.253	368	.211	1.311	1.046
PEQ	0.370	.543	1.299	368	.195	1.45	1.116
OQ	0.791	.374	-.808	368	.420	-.756	.936
SFQ	1.040	.308	.708	368	.479	.615	.868
SQ	0.053	.818	-1.626	368	.105	-.994	.611
SS	2.282	.132	-1.397	368	.163	-.870	.623
SI	0.059	.808	-1.721	368	.086	-.879	.510
UI	0.067	.796	-1.319	368	.188	-.759	.576
SL	0.010	.919	-.818	368	.414	-.525	.642

5.1.3 Respondents' Demographic Characteristics

Section E of the questionnaire was designed to capture some basic demographic details of the respondents that participated in this study. The results of the demographic characteristics are presented in Table 5-2 to 5-6.

Table 5-2 Gender Results

	Frequency	Percent	Cumulative Percent
Male	174	47.0	47.0
Female	196	53.0	100.0
Total	370	100.0	

There were less male respondents than female respondents, 174 and 196 respectively. The results in table 5-2 indicate that there was an almost equal split in the gender of the respondents (47% male; 53% female).

Table 5-3 Age Results

	Frequency	Percent	Cumulative Percent
18-22	353	95.4	95.4
23-27	16	4.3	99.7
27+	1	0.3	100.0
Total	370	100.0	

The biggest proportion of the total sample was 95.4%, and was composed of respondents aged between 18 and 22. Respondents aged between 23 and 27 accounted for 4.3% of the total sample, and only one respondent aged more than 27, accounted for 0.3% of the total sample.

Table 5-4 Year-of-Study Results

	Frequency	Percent	Cumulative Percent
First Year	190	51.4	51.4
Third Year	180	48.6	100.0
Total	370	100.0	

The results in table 5-4 indicate that there was an almost equal split in the year-of-study of the respondents (51.4% First Year student; 48.6% Third Year student). There were more First Year respondents than Third Year respondents, 190 and 180 respectively.

Table 5-5 Study Major Results

	Frequency	Percent	Cumulative Percent
Economics	128	34.6	34.6
Engineering	43	11.6	46.2
Literature	37	10.0	56.2
Science	4	1.1	57.3
Business Management	137	37.0	94.3
Art	21	5.7	100.0
Total	370	100.0	

The biggest proportion of the total sample was composed of respondents who were enrolled in the business management major, 37%. Respondents enrolled in the economics major accounted for 34.6% of the total sample, and formed the second biggest proportion of the total sample, followed by respondents enrolled in the engineering major, 11.6%.

Table 5-6 GPA Results

	Frequency	Percent	Cumulative Percent
3.5-4.0	41	11.1	11.1
3.0-3.4	126	34.1	45.1
2.5-2.9	98	26.5	71.6
2.0-2.4	64	17.3	88.9
1.5-1.9	25	6.8	95.7
1.0-1.4	3	0.8	96.5
0-0.9	13	3.5	100.0
Total	370	100.0	

Respondents who had GPA between 3.0 and 3.4 formed the biggest proportion of the total sample, 34.1%, followed by respondents who had a GPA between 2.5 and 2.9, 26.5%.

5.2 Outliers

Based on standardized value (z-scores) less than -4 or greater than +4, no outliers were identified in the data set of this study. Therefore, all 370 responses were retained in the data set (Hair et al., 2010).

5.3 Normality Test

The data set was examined for normality. The results pertaining to the normality test of the data indicated that the maximum absolute values of skewness and kurtosis were 1.13 and 0.882

respectively (see Appendix 2). These values were well below their respective cut-offs of 3 for skewness and 8 for kurtosis as suggested by Kline (2005), implying that the observed variables in the sample data were normally distributed.

5.4 Descriptive Statistics

A descriptive analysis was conducted before splitting the data set. Means and standard deviations were calculated for all measured items of the service quality dimensions, the higher order constructs: Service Quality, Student Satisfaction, Student Involvement, University Image, and Student Loyalty that were used in the questionnaire (based on a seven-point scale: 1 =strongly disagree; 4 = neutral; 7 = strongly agree). The descriptive statistics are provided in Tables 5.7 to 5.16.

5.4.1 The Service Quality Dimension

5.4.1.1 Primary Dimensions

Table 5-7 shows a summary of the means and standard deviations for the eight items used to measure the primary dimensions of service quality. The means ranged from 4.74 to 5.52, and the standard deviations ranged from 1.309 to 1.520. On average, the means of the primary dimensions of service quality for measured items were above the midpoint of the scale (mean =5.17, standard deviation =1.393). This suggests that, on average, respondents agreed with the positive statements about the primary dimensions of service quality for the higher education institutions that were featured in the study.

Table 5-7 Means and Standard Deviations of the Primary Dimensions

Item No.	Min	Max	Mean	Standard Deviation	Item No.	Min	Max	Mean	Standard Deviation
IQ8	1	7	5.29	1.340	OQ6	1	7	4.94	1.399
IQ9	1	7	5.06	1.500	OQ7	1	7	4.74	1.520
PEQ8	1	7	5.52	1.309	SFQ6	1	7	5.35	1.316
PEQ9	1	7	5.27	1.378	SFQ7	1	7	5.16	1.385

5.4.1.2 Interaction Quality

Table 5-8 presents a summary of the means and standard deviations for the seven measured items used to measure the Interaction Quality dimension. The means ranged from 5.04 to 5.68 and the standard deviations ranged from 1.185 to 1.536. For the majority of the items, the mean of the measured items of Interaction Quality was below the midpoint of the scale (mean= 5.29, standard

deviation = 1.391). This suggests that the majority of the respondents disagreed with the positive statements about Interaction Quality for higher education institutions.

Table 5-8 Means and Standard Deviations of Interaction Quality

Item No.	Min	Max	Mean	Standard Deviation	Item No.	Min	Max	Mean	Standard Deviation
IQ1	1	7	5.26	1.359	IQ5	1	7	5.23	1.384
IQ2	1	7	5.53	1.301	IQ6	1	7	5.12	1.536
IQ3	2	7	5.68	1.185	IQ7	1	7	5.18	1.524
IQ4	1	7	5.04	1.448					

5.4.1.3 Physical Environment Quality

Table 5-9 shows a summary of the means and standard deviations for the seven measured items used to measure the Physical Environment Quality dimension. The means ranged from 4.78 to 5.63, and the standard deviations ranged from 1.441 to 1.853. On average, the measured items for Physical Environment Quality dimension were above the midpoint of the scale (mean = 5.18, standard deviation = 1.593). This suggests that, on average, respondents agreed with the positive statements of Physical Environment Quality for the higher education institutions.

Table 5-9 Means and Standard Deviations of Physical Environment Quality

Item No.	Min	Max	Mean	Standard Deviation	Item No.	Min	Max	Mean	Standard Deviation
PEQ1	1	7	5.28	1.527	PEQ5	1	7	5.26	1.531
PEQ2	1	7	5.16	1.468	PEQ6	1	7	5.63	1.441
PEQ3	1	7	4.94	1.853	PEQ7	1	7	5.19	1.573
PEQ4	1	7	4.78	1.759					

5.4.1.4 Outcome Quality

Table 5-10 presents a summary of the means and standard deviations for the five measured items used to measure the Outcome Quality dimension. The means ranged from 4.25 to 4.98 and the standard deviations ranged from 1.397 to 1.592. For the majority, the means of the measured items for the Outcome Quality dimension was above the midpoint of the scale (mean = 4.64, standard deviation = 1.482). This suggests that the majority of the respondents agreed with the positive statements of Outcome Quality for higher education institutions.

Table 5-10 Means and Standard Deviations of Outcome Quality

Item No.	Min	Max	Mean	Standard Deviation
OQ1	1	7	4.25	1.554
OQ2	1	7	4.26	1.592
OQ3	1	7	4.90	1.459
OQ4	1	7	4.82	1.409
OQ5	1	7	4.98	1.397

5.4.1.5 Social Factors Quality

Table 5-11 shows a summary of the means and standard deviations for the five measured items used to measure the Social Factors dimension. The means ranged from 5.08 to 5.43 and the standard deviations ranged from 1.336 to 1.461. The majority of the mean of the measured items for the Social Factor Quality dimension was below the midpoint of the scale (mean = 5.23, standard deviation =1.397). This suggests that the majority of the respondents disagreed with the positive statements of Social Factors Quality for higher education institutions.

Table 5-11 Means and Standard Deviations of Social Factors Quality

Item No.	Min	Max	Mean	Standard Deviation
SFQ1	1	7	5.08	1.446
SFQ2	1	7	5.19	1.461
SFQ3	1	7	5.34	1.354
SFQ4	1	7	5.12	1.387
SFQ5	1	7	5.43	1.336

5.4.2 Higher-Order Constructs

5.4.2.1 Service Quality

Table 5-12 presents a summary of the means and standard deviations for the five items used to measure the Service Quality construct. The means ranged from 4.05 to 4.35 and the standard deviations ranged from 1.257 to 1.294. For the majority, the means of the Service Quality items were below the midpoint of the scale (mean = 4.14, standard deviation = 1.279) suggesting that most respondents disagreed with the positive Service Quality statements.

Table 5-12 Means and Standard Deviations of Service Quality

Item No.	Min	Max	Mean	Standard Deviation
SQ1	1	7	4.08	1.284
SQ2	1	7	4.08	1.269
SQ3	1	7	4.05	1.291
SQ4	1	7	4.16	1.294
SQ5	1	7	4.35	1.257

5.4.2.2 Student Satisfaction

Table 5-13 shows a summary of the means and standard deviations for the five items used to measure the Student Satisfaction construct. The means ranged from 4.25 to 4.72 and the standard deviations ranged from 1.345 to 1.382. For the majority, the means of the Student Satisfaction items were below the midpoint of the scale (mean = 4.45, standard deviation = 1.357) suggesting that most respondents disagreed with the positive Student Satisfaction statements. This result shows that most respondents were not overly satisfied with their higher education experience.

Table 5-13 Means and Standard Deviations of Student Satisfaction

Item No.	Min	Max	Mean	Standard Deviation
SS1	1	7	4.25	1.382
SS2	1	7	4.72	1.345
SS3	1	7	4.33	1.347
SS4	1	7	4.52	1.354
SS5	1	7	4.41	1.355

5.4.2.3 Student Involvement

Table 5-14 shows a summary of the means and standard deviations for the five items used to measure the Student Involvement construct. The means ranged from 2.52 to 4.55 and the standard deviations ranged from 1.286 to 1.772. The majority of the means of the Student Involvement measured items were above the midpoint of the scale (mean = 3.89, standard deviation = 1.460). This result indicates that most respondents agreed with the positive Student Involvement statements.

Table 5-14 Means and Standard Deviations of Student Involvement

Item No.	Min	Max	Mean	Standard Deviation
SI1	1	7	2.52	1.772
SI2	1	7	4.18	1.396
SI3	1	7	3.92	1.286
SI4	1	7	4.55	1.440
SI5	1	7	4.26	1.405

5.4.2.4 University Image

Table 5-15 presents a summary of the means and standard deviations for the five items used to measure the University Image construct. The means ranged from 4.53 to 4.70 and the standard deviations ranged from 1.202 to 1.299. On average, the means of the University Image measured items were below the midpoint of the scale (mean = 4.63, standard deviation = 1.264). This finding demonstrates that the respondents perceived that the higher education institutions did not have a favourable university image.

Table 5-15 Means and Standard Deviations of University Image

Item No.	Min	Max	Mean	Standard Deviation
UI1	1	7	4.70	1.268
UI2	1	7	4.53	1.267
UI3	1	7	4.62	1.202
UI4	1	7	4.70	1.284
UI5	1	7	4.60	1.299

5.4.2.5 Student Loyalty

Table 5-16 presents a summary of the means and standard deviations for the five items used to measure the Student Loyalty construct. The means ranged from 3.58 to 5.35 and the standard deviations ranged from 1.415 to 1.705. On average, the means of the Student Loyalty measured items were below the midpoint of the scale (mean = 4.43, standard deviation = 1.556) suggesting that most respondents disagreed with the positive higher education institution statements relating to student loyalty.

Table 5-16 Means and Standard Deviations of Student Loyalty

Item No.	Min	Max	Mean	Standard Deviation
SL1	1	7	5.35	1.635
SL2	1	7	3.58	1.705
SL3	1	7	4.30	1.494
SL4	1	7	4.74	1.415
SL5	1	7	4.18	1.533

5.5 Data Analysis Interpretation

When the outliers and normality tests were satisfied, the collected dataset was randomly split into two samples (Hair et al., 2010; Kline, 2005) to test the 20 hypotheses (Table 5-17) to satisfy four research objectives stated in this study (see Section 1.4).

The first sample (Sample One), comprised 120 questionnaires as the minimum sample size suggested by Hair et al. (2010) to conduct an EFA for all 24 items: 7 items for Interaction Quality, 7 items for Physical Environment Quality, 5 items for Outcome Quality, and 5 items for Social Factors Quality. R-mode factor analysis using principal component analysis (PCA) and a VARIMXA rotation (orthogonal) was used in this study (Hair et al., 2010; Stewart, 1981), and in turn, partially satisfied Research Objective 1 (See Table 5.17). The second sample (Sample Two) consisted of 250 questionnaires, above the minimum sample size of 200 for conducting SEM using MLE (Hair et al., 2010; Anderson & Gerbing, 1988). This process satisfied Research Objective 1 and 2 (See Table 5.17). The second sample was also used to validate the measurement model and structural model of the causal path model in order to satisfy Research Objective 3 (See Table 5.17). Finally, the second sample was used to conduct a multi-group analysis, which in turn, satisfied Research Objective 4 (See Table 5.17). A summary of the findings of the hypotheses tests are presented in Table 5.89. The following sections discuss the key results.

Table 5-17 Hypotheses and Statements

Hypotheses No.	Descriptions
H1	There is a significant positive relationship between the Interaction Quality primary dimension and students' overall service quality perceptions.
H2	There is a significant positive relationship between the Physical Environment Quality primary dimension and students' overall service quality perceptions.
H3	There is a significant positive relationship between the Outcome Quality primary dimension and students' overall service quality perceptions.

H4	There is a significant positive relationship between the Social Factors Quality primary dimension and students' overall service quality perceptions.
H5	Students will vary in their perceptions of the importance of each of the primary dimensions.
H6	Higher perceptions of Service Quality positively affect Student Satisfaction.
H7	Higher perceptions of Service Quality positively affect University Image.
H8	Higher perceptions of Service Quality positively affect Student Involvement.
H9	Higher perceptions of Service Quality positively affect Student Loyalty.
H10	Student Satisfaction mediates the relationship between Service Quality and Student Loyalty.
H11	Higher University Image positively affects Student Satisfaction.
H12	Higher University Image positively affects Student Loyalty.
H13	Higher Student Involvement positively affects Student Satisfaction.
H14	Higher Student Involvement positively affects University Image.
H15	Higher Student Involvement positively affects Student Loyalty.
H16	Student Involvement mediates the relationship between Service Quality and Student Satisfaction.
H17	Student Involvement mediates the relationship between Service Quality and University Image.
H18	Higher Student Satisfaction positively affects Student Loyalty.
H19	Student perceptions relating to interrelationships among Service Quality, Student Satisfaction, Student Involvement, University Image, and Student Loyalty will differ between the First Year and Third Year students.
H20	Student perceptions relating to interrelationships among Service Quality, Student Satisfaction, Student Involvement, University Image, and Student Loyalty will differ between Males and Females.

The following sections provide the results of the exploratory factor analysis undertaken in this study.

5.6 Exploratory Factor Analysis for the Primary Dimension Interaction Quality

The following sections provide the results of exploratory factor analysis for the Interaction Quality primary dimension.

5.6.1 Tests for Determining the Appropriateness of Exploratory Factor Analysis (Primary Dimension Interaction Quality)

As discussed in Section 4.9.1.2, prior to performing an exploratory factor analysis for Interaction Quality, the Sample One data set was examined in order to ensure the appropriateness of the data set for exploratory factor analysis as suggested by Hair et al. (2010).

5.6.1.1 Examination of the Correlation Matrix (Primary Dimension Interaction Quality)

The visual inspection of the correlation matrix (See Appendix 3, Table A3.1) presented that there were many substantial correlations above 0.30 as suggested by Pallant (2010), indicating that the data shared common factors appropriate for exploratory factor analysis (Hair et al., 2010).

5.6.1.2 Inspection of the Anti-Image Correlation Matrix (Primary Dimension Interaction Quality)

The visual inspection of the anti-image correlation matrix (See Appendix 3, Table A3.2) revealed that the majority of the partial correlations were low as suggested by Field (2009) and Tabachnick and Fidell (2007), indicating that the data set was appropriate for exploratory factor analysis.

5.6.1.3 Bartlett's Test of Sphericity (Primary Dimension Interaction Quality)

Table 5-18 Bartlett's Test (Interaction Quality)

Bartlett's Test of Sphericity	Approx. Chi-Square	1477.407
	df	21
	Sig.	.000

The value of Bartlett's test was statistically significant (sig. < 0.05) as suggested by Pallant (2010) and Hinton et al. (2004), indicating that the data set was appropriate for EFA.

5.6.1.4 Kaiser-Meyer-Olkin Measure of Sampling Adequacy (Primary Dimension Interaction Quality)

The Kaiser-Meyer-Olkin measure of sampling adequacy index was 0.904. The KMO value of 0.904 exceeded the cut-off level of 0.60 (Tabachnick & Fidell, 2007) and was greater than 0.80, which is defined by Kaiser and Rice (1974) as "meritorious", indicating that the data set was appropriate for EFA.

5.6.2 Results of Exploratory Factor Analysis for the Primary Dimension Interaction Quality

The results of the tests for determining appropriateness of EFA for Interaction Quality indicated that the Sample One data set was appropriate for exploratory factor analysis. Consequently, principle

component factor analysis was conducted on all of the items measuring Interaction Quality that were generated from the information gathered from the focus groups and the literature review.

5.6.2.1 Latent Root Criterion (Primary Dimension Interaction Quality)

The result of the latent root criterion (see Appendix 3, Table A3.3) showed one factor with Eigenvalues greater than one was generated, so this criterion supported the presence of one factor or component. Therefore, the Interaction Quality dimension should be extracted from the 7 variables submitted for EFA.

5.6.2.2 Percentage of Variance Criterion (Primary Dimension Interaction Quality)

The Interaction Quality dimension extracted explained approximate 63.88% of the variation in the data set, and was above 60% as suggested by Hair et al. (2010) (See Appendix 3, Table A3.3).

5.6.2.3 Scree Test Criterion (Primary Dimension Interaction Quality)

By laying a straight edge across the bottom portion of the roots, there were 1 dimension before the curve became approximately a straight line (See Figure 5-1), indicating that the extraction of 1 dimension was appropriate for this analysis (Osborne & Costello, 2005; Stewart, 1981).

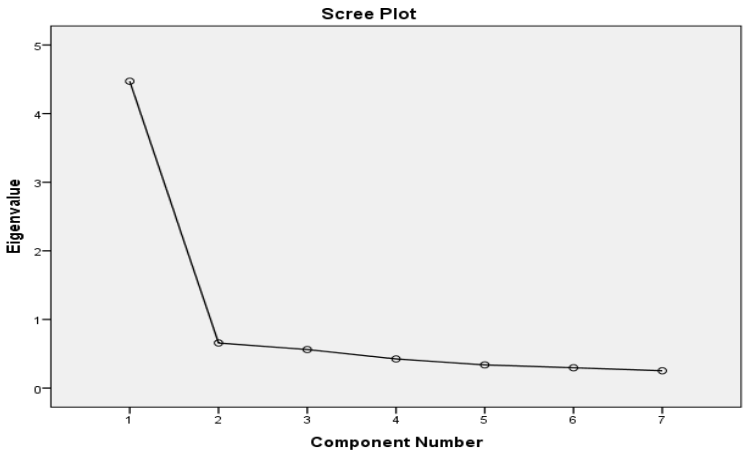


Figure 5-1 Scree Plot (Interaction Quality)

5.6.2.4 Factor Rotation (Primary Dimension Interaction Quality)

Both rotations, VARIMAX and the OBLIMIN, demonstrated a similar pattern for all 7 items. However, the VARIMAX rotation produced a better structure in terms of the content validity of the factors. Therefore, the final factor structure was based on the factor loadings from the VARIMAX rotation, since the output of an Oblique rotation is more difficult to interpret (Tabachnick & Fidell, 2007).

5.6.2.5 Factor Interpretation (Primary Dimension Interaction Quality)

As reported in Table A7.1, the 6 items loaded on 1 factor, and IQ4 from Interaction Quality dimension loaded on the Physical Environment Quality dimension. Therefore, IQ4 was deleted since it did not

load exactly on the dimension as originally predicted. All of the factor loadings for the items retained are above 0.50. Factor loading values ranged from 0.519 to 0.803.

5.6.2.6 Unidimensionality Analysis (Primary Dimension Interaction Quality)

Any items that highly load on more than one factor should be eliminated in order to ensure an adequate unidimensionality. All items highly loaded on a single factor, indicating an adequate unidimensionality among the items (Bernard, 2000).

5.6.2.7 Reliability and Validity (Primary Dimension Interaction Quality)

5.6.2.7.1 Reliability (Primary Dimension Interaction Quality)

The remaining items were subjected to a reliability test. Reliability was measured with Cronbach's coefficient alpha. The factors had a Cronbach's coefficient alpha greater than .70 as suggested by Nunnally and Bernstein (1994). Table 5-19 presents the result of reliability test.

Table 5-19 Reliability of Scaled Items for Interaction Quality

Dimension	Cronbach's Coefficient Alphas	Items Nos.	Rotation Loadings
Interaction Quality	0.850	IQ1 IQ2 IQ3 IQ5 IQ6 IQ7	0.803 0.761 0.695 0.571 0.763 0.519

5.6.2.7.2 Validity (Primary Dimension Interaction Quality)

The 6 variables loaded on 1 factor as expected from the literature review and the focus group discussions. Therefore, the researcher concluded that the measurement instrument for Interaction Quality used in this study exhibited adequate content validity (Litwin, 1995; Bollen, 2014; Constantin & Voicu, 2015).

5.7 Exploratory Factor Analysis for the Primary Dimension Physical Environment Quality

The following sections provide the results of exploratory factor analysis for the Physical Environment Quality primary dimension.

5.7.1 Tests for Determining Appropriateness of Exploratory Factor Analysis (Primary Dimension Physical Environment Quality)

As discussed in Section 4.9.1.2, prior to performing an exploratory factor analysis for Physical Environment Quality, the Sample One data set was examined in order to ensure the appropriateness of the data set for exploratory factor analysis as suggested by reference.

5.7.1.1 Examination of the Correlation Matrix (Primary Dimension Physical Environment Quality)

The visual inspection of the correlation matrix (See Appendix 4, Table A4.1) presented that there were many substantial correlations above 0.30 as suggested by Pallant (2010), indicating that the data set was appropriate for exploratory factor analysis (Hair et al., 2010).

5.7.1.2 Inspection of the Anti-Image Correlation Matrix (Primary Dimension Physical Environment Quality)

The visual inspection of the anti-image correlation matrix (See Appendix 4, Table A4.2) revealed that the majority of the partial correlations were low as suggested by Field (2009) and Tabachnick and Fidell (2007), indicating that the data set was appropriate for exploratory factor analysis.

5.7.1.3 Bartlett's Test of Sphericity (Primary Dimension Physical Environment Quality)

Table 5-20 Bartlett's Test (Physical Environment Quality)

Bartlett's Test of Sphericity	Approx. Chi-Square	1215.573
	df	21
	Sig.	.000

The value of Bartlett's test was statistically significant (sig. < 0.05) as suggested by Pallant (2010) and Hinton et al. (2004), indicating that the data set was appropriate for exploratory factor analysis.

5.7.1.4 Kaiser-Meyer-Olkin Measure of Sampling Adequacy (Primary Dimension Physical Environment Quality)

The Kaiser-Meyer-Olkin measure of sampling adequacy index was 0.892. The KMO value of 0.892 exceeded the cut-off level of 0.60 (Tabachnick & Fidell, 2007) and was greater than 0.80, which is defined by Kaiser and Rice (1974) as "meritorious", indicating that the data set was appropriate for exploratory factor analysis.

5.7.2 Results of Exploratory Factor Analysis for the Primary Dimension Physical Environment Quality

The results of the tests for determining appropriateness of exploratory factor analysis for Physical Environment Quality indicated that the Sample One data set was appropriate for exploratory factor analysis. Consequently, principle component factor analysis was conducted on all of the items measuring Physical Environment Quality that were generated from the information gathered from the focus groups and the literature review.

5.7.2.1 Latent Root Criterion (Primary Dimension Physical Environment Quality)

The result of the latent root criterion (see Appendix 4, Table A4.3) showed one factor with Eigenvalues greater than one was generated, so this criterion supported the presence of one factor or component. Therefore, the Physical Environment Quality dimension should be extracted from the 7 variables submitted for EFA.

5.7.2.2 Percentage of Variance Criterion (Primary Dimension Physical Environment Quality)

The Physical Environment Quality dimension extracted explained approximately 59.34% of the variation in the data set. The total variance for this physical environment quality is lower than 60%; however, it is considered satisfactory since Hair et al. (2010) suggest that a total variance below 60% is common in social science research (See Appendix 4, Table A4.3).

5.7.2.3 Scree Test Criterion (Primary Dimension Physical Environment Quality)

By laying a straight edge across the bottom portion of the roots, there was 1 dimension before the curve became approximately a straight line (See Figure 5-2), indicating that the extraction of 1 dimension was appropriate for this analysis (Osborne & Costello, 2005; Stewart, 1981).

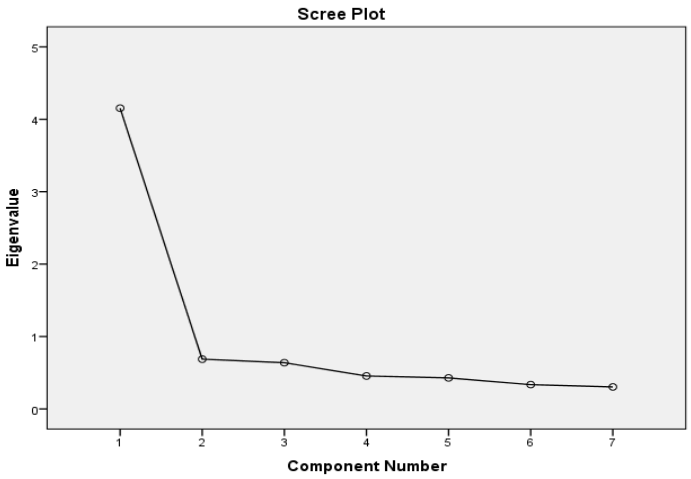


Figure 5-2 Scree Plot (Physical Environment Quality)

5.7.2.4 Factor Rotation (Primary Dimension Physical Environment Quality)

Both rotations, VARIMAX and the OBLIMIN, demonstrated a similar pattern for all 7 items. However, the VARIMAX rotation produced a better structure in terms of the content validity of the factors. Therefore, the final factor structure was based on the factor loadings from the VARIMAX rotation, since the output of an Oblique rotation is more difficult to interpret (Tabachnick & Fidell, 2007).

5.7.2.5 Factor Interpretation (Primary Dimension Physical Environment Quality)

As reported in Table A7.1, the 5 items loaded on 1 factor, and items PEQ6 and PEQ7 from Physical Environment Quality dimension loaded wrongly on a new dimension on an unidentified factor. Therefore, item PEQ6 and PEQ7 were deleted since they did not load exactly on the dimensions as originally predicted. All of the factor loadings for the items retained are above 0.50. Factor loading values ranged from 0.661 to 0.800.

5.7.2.6 Unidimensionality Analysis (Primary Dimension Physical Environment Quality)

Any items that highly load on more than one factor should be eliminated in order to ensure an adequate unidimensionality. All items highly loaded on a single factor, indicating an adequate unidimensionality among the items (Bernard, 2000).

5.7.2.7 Reliability and Validity (Primary Dimension Physical Environment Quality)

5.7.2.7.1 Reliability (Primary Dimension Physical Environment Quality)

The remaining items were subjected to a reliability test. Reliability was measured with Cronbach's coefficient alpha. All of the items had a Cronbach's coefficient alpha greater than .70 as suggested by Nunnally and Bernstein (1994). Table 5-21 presents the results of reliability tests.

Table 5-21 Reliability of Scaled Items for Physical Environment Quality

Dimension	Cronbach's Coefficient Alphas	Items Nos.	Rotation Loadings
Physical Environment Quality	0.850	PEQ1 PEQ2 PEQ3 PEQ4 PEQ5	0.800 0.661 0.705 0.742 0.679

5.7.2.7.2 Validity (Primary Dimension Physical Environment Quality)

The five variables loaded on 1 factor as expected from the literature review and the focus group discussions. Therefore, the researcher concluded that the measurement instrument for Physical Environment Quality used in this study exhibited adequate content validity (Litwin, 1995; Bollen, 2014; Constantin & Voicu, 2015).

5.8 Exploratory Factor Analysis for the Primary Dimension Outcome Quality

The following sections provide the results of exploratory factor analysis for the Outcome Quality primary dimension.

5.8.1 Tests for Determining Appropriateness of Exploratory Factor Analysis (Primary Dimension Outcome Quality)

As discussed in Section 4.9.1.2, prior to performing an exploratory factor analysis for Outcome Quality, the Sample One data set was examined in order to ensure the appropriateness of the data set for exploratory factor analysis.

5.8.1.1 Examination of the Correlation Matrix (Primary Dimension Outcome Quality)

The visual inspection of the correlation matrix (See Appendix 5, Table A5.1) revealed that there were many substantial correlations above 0.30 as suggested by Pallant (2010), indicating that the data set was appropriate for exploratory factor analysis (Hair et al., 2010).

5.8.1.2 Inspection of the Anti-Image Correlation Matrix (Primary Dimension Outcome Quality)

The visual inspection of the anti-image correlation matrix (See Appendix 5, Table A5.2) showed that the majority of the partial correlations were low as suggested by Field (2009) and Tabachnick and Fidell (2007), indicating that the data set was appropriate for exploratory factor analysis.

5.8.1.3 Bartlett's Test of Sphericity (Primary Dimension Outcome Quality)

Table 5-22 Bartlett's Test (Outcome Quality)

Bartlett's Test of Sphericity	Approx. Chi-Square	1647.394
	df	10
	Sig.	.000

The value of Bartlett's test was statistically significant (sig. < 0.05) as suggested by Pallant (2010) and Hinton et al. (2004), indicating that the data set was appropriate for exploratory factor analysis.

5.8.1.4 Kaiser-Meyer-Olkin Measure of Sampling Adequacy (Primary Dimension Outcome Quality)

The Kaiser-Meyer-Olkin measure of sampling adequacy index was 0.864. The KMO value of 0.864 exceeded the cut-off level of 0.60 (Tabachnick & Fidell, 2007) and was greater than 0.80, which is defined by Kaiser and Rice (1974) as "meritorious", indicating that the data set was appropriate for exploratory factor analysis.

5.8.2 Results of Exploratory Factor Analysis for the Primary Dimension Outcome Quality

The results of the tests for determining appropriateness of exploratory factor analysis for Outcome Quality indicated that the Sample One data set was appropriate for exploratory factor analysis. Consequently, principle component factor analysis was conducted on all of the items measuring Outcome Quality that were generated from the information gathered from the focus groups and the literature review.

5.8.2.1 Latent Root Criterion (Primary Dimension Outcome Quality)

The result of the latent root criterion (see Appendix 5, Table A5.3) showed one factor with Eigenvalues greater than one was generated, so this criterion supported the presence of one factor or component. Therefore, the Outcome Quality dimension should be extracted from the 5 variables submitted for EFA.

5.8.2.2 Percentage of Variance Criterion (Primary Dimension Outcome Quality)

The Outcome Quality dimension extracted explained approximately 79.70% of the variation in the data set, and was above 60% as suggested by Hair et al. (2010) (See Appendix 5, Table A5.3).

5.8.2.3 Scree Test Criterion (Primary Dimension Outcome Quality)

By laying a straight edge across the bottom portion of the roots, there was 1 dimension before the curve became approximately a straight line (See Figure 5-3), indicating that the extraction of 1 dimension was appropriate for this analysis (Osborne & Costello, 2005; Stewart, 1981).

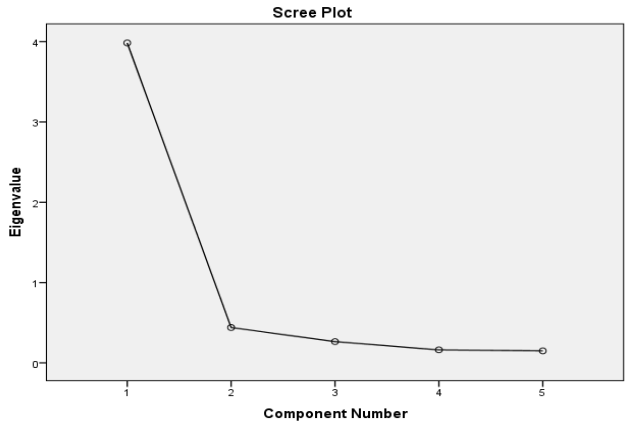


Figure 5-3 Scree Plot (Outcome Quality)

5.8.2.4 Factor Rotation (Primary Dimension Outcome Quality)

Both rotations, VARIMAX and the OBLIMIN, demonstrated a similar pattern for all 5 items. However, the VARIMAX rotation produced a better structure in terms of the content validity of the factors.

Therefore, the final factor structure was based on the factor loadings from the VARIMAX rotation, since the output of an Oblique rotation is more difficult to interpret (Tabachnick & Fidell, 2007).

5.8.2.5 Factor Interpretation (Primary Dimension Outcome Quality)

As reported in Table A7.1, the 5 items loaded on 1 factor. All of the 5 items that had significant loadings above 0.50 were retained in the analysis. Factor loading values ranged from 0.751 to 0.858.

5.8.2.6 Unidimensionality Analysis (Primary Dimension Outcome Quality)

Any items that highly load on more than one factor should be eliminated in order to ensure an adequate unidimensionality. All items highly loaded on a single factor, indicating an adequate unidimensionality among the items (Bernard, 2000).

5.8.2.7 Reliability and Validity (Primary Dimension Outcome Quality)

5.8.2.7.1 Reliability (Primary Dimension Outcome Quality)

The remaining items were subjected to a reliability test. Reliability was measured with Cronbach's coefficient alpha. The factors had a Cronbach's coefficient alpha greater than .70 as suggested by Nunnally and Bernstein (1994). Table 5-23 presents the result of reliability test.

Table 5-23 Reliability of Scaled Items for Outcome Quality

Dimension	Cronbach's Coefficient Alphas	Items Nos.	Rotation Loadings
Outcome Quality	0.926	OQ1 OQ2 OQ3 OQ4 OQ5	0.795 0.858 0.751 0.805 0.793

5.8.2.7.2 Validity (Primary Dimension Outcome Quality)

The 5 variables loaded on 1 factor as expected from the literature review and the focus group discussions. Therefore, the researcher concluded that the measurement instrument for Outcome Quality used in this study exhibited adequate content validity (Litwin, 1995; Bollen, 2014; Constantin & Voicu, 2015).

5.9 Exploratory Factor Analysis for the Primary Dimension Social Factors Quality

The following sections provide the results of exploratory factor analysis for the Social Factors Quality primary dimension.

5.9.1 Tests for Determining Appropriateness of Exploratory Factor Analysis (Primary Dimension Social Factors Quality)

As discussed in Section 4.9.1.2, prior to performing an exploratory factor analysis for Social Factors, the Sample One data set was examined in order to ensure the appropriateness of the data set for exploratory factor analysis.

5.9.1.1 Examination of the Correlation Matrix (Primary Dimension Social Factors Quality)

The visual inspection of the correlation matrix (See Appendix 6, Table A6.1) revealed that there were many substantial correlations above 0.30 as suggested by Pallant (2010), indicating that the data set was appropriate for exploratory factor analysis (Hair et al., 2010).

5.9.1.2 Inspection of the Anti-Image Correlation Matrix (Primary Dimension Social Factors Quality)

The visual inspection of the anti-image correlation matrix (See Appendix 6, Table A6.2) showed that the majority of the partial correlations were low as suggested by Field (2009) and Tabachnick and Fidell (2007), indicating that the data set was appropriate for exploratory factor analysis.

5.9.1.3 Bartlett's Test of Sphericity (Primary Dimension Social Factors Quality)

Table 5-24 Bartlett's Test (Social Factors Quality)

Bartlett's Test of Sphericity	Approx. Chi-Square	1341.416
	df	10
	Sig.	.000

The value of Bartlett's test was statistically significant (sig. < 0.05) as suggested by Pallant (2010) and Hinton et al. (2004), indicating that the data set was appropriate for exploratory factor analysis.

5.9.1.4 Kaiser-Meyer-Olkin Measure of Sampling Adequacy (Primary Dimension Social Factors Quality)

The Kaiser-Meyer-Olkin measure of sampling adequacy index was 0.877. The KMO value of 0.877 exceeded the cut-off level of 0.60 (Tabachnick & Fidell, 2007) and was greater than 0.80, which is defined by Kaiser and Rice (1974) as "meritorious", indicating that the data set was appropriate for exploratory factor analysis.

5.9.2 Results of Exploratory Factor Analysis for the Primary Dimension Social Factors Quality

The results of the tests for determining appropriateness of exploratory factor analysis for Social Factors Quality indicated that the Sample One data set was appropriate for exploratory factor analysis. Consequently, principle component factor analysis was conducted on all of the items measuring Social Factors that were generated from the information gathered from the focus groups and the literature review.

5.9.2.1 Latent Root Criterion (Primary Dimension Social Factors Quality)

The result of the latent root criterion (see Appendix 6, Table A6.3) showed one factor with Eigenvalues greater than one was generated, so this criterion supported the presence of one factor or component. Therefore, Social Factors Quality dimension should be extracted from the 5 variables submitted for EFA.

5.9.2.2 Percentage of Variance Criterion (Primary Dimension Social Factors Quality)

The Social Factors Quality primary dimension extracted explained approximately 76.1% of the variation in the data set, and was above 60% as suggested by Hair et al. (2010) (See Appendix 6, Table A6.3).

5.9.2.3 Scree Test Criterion (Primary Dimension Social Factors Quality)

By laying a straight edge across the bottom portion of the roots, there was 1 dimension before the curve became approximately a straight line (See Figure 5-4), indicating that the extraction of 1 dimension was appropriate for this analysis (Osborne & Costello, 2005; Stewart, 1981).

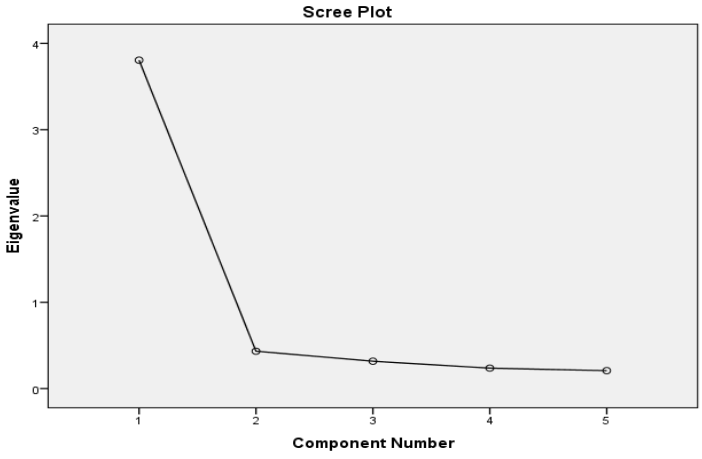


Figure 5-4 Scree Plot (Social Factors Quality)

5.9.2.4 Factor Rotation (Primary Dimension Social Factors Quality)

Both rotations, VARIMAX and the OBLIMIN, demonstrated a similar pattern for all 5 items. However, the VARIMAX rotation produced a better structure in terms of the content validity of the factors. Therefore, the final factor structure was based on the factor loadings from the VARIMAX rotation, since the output of an Oblique rotation is more difficult to interpret (Tabachnick & Fidell, 2007).

5.9.2.5 Factor Interpretation (Primary Dimension Social Factors Quality)

As reported in Table A7.1, the 5 items loaded on 1 factor. All of the 5 items that had significant loadings above 0.50 were retained in the analysis. Factor loading values ranged from 0.626 to 0.823.

5.9.2.6 Unidimensionality Analysis (Primary Dimension Social Factors Quality)

Any items that highly load on more than one factor should be eliminated in order to ensure an adequate unidimensionality. All items highly loaded on a single factor, indicating an adequate unidimensionality among the items (Bernard, 2000).

5.9.2.7 Reliability and Validity (Primary Dimension Social Factors Quality)

5.9.2.7.1 Reliability (Primary Dimension Social Factors Quality)

The remaining items were subjected to a reliability test. Reliability was measured with Cronbach's coefficient alpha. All factors had a Cronbach's coefficient alpha greater than .70 as suggested by Nunnally and Bernstein (1994). Table 5-25 presents the result of reliability test.

Table 5-25 Reliability of Scaled Items for Social Factors Quality

Dimension	Cronbach's Coefficient Alphas	Items Nos.	Rotation Loadings
Social Factors Quality	0.914	SFQ1 SFQ2 SFQ3 SFQ4 SFQ5	0.721 0.758 0.823 0.626 0.796

5.9.2.7.2 Validity (Primary Dimension Social Factors Quality)

The 5 variables loaded on 1 factor as expected from the literature review and the focus group discussions. Therefore, the researcher concluded that the measurement instrument for Social Factors exhibited adequate content validity (Litwin, 1995; Bollen, 2014; Constantin & Voicu, 2015).

5.10 Exploratory Factor Analysis results for Primary Dimensions

The following sections provide a summary of the results of exploratory factor analysis for the four primary dimensions.

5.10.1 Tests for Determining Appropriateness of Exploratory Factor Analysis (Primary Dimensions)

As discussed in Section 4.9.1.2, prior to performing an exploratory factor analysis for the primary dimensions, the Sample One data set was examined in order to ensure the appropriateness of the data set for exploratory factor analysis.

5.10.1.1 Examination of the Correlation Matrix (Primary Dimensions)

The visual inspection of the correlation matrix (See Appendix 3-6, Table A3.1-A6.1) revealed that there were many substantial correlations above 0.30 as suggested by Pallant (2010), indicating that the data set was appropriate for exploratory factor analysis (Hair et al., 2010).

5.10.1.2 Inspection of the Anti-Image Correlation Matrix (Primary Dimensions)

The visual inspection of the anti-image correlation matrix (See Appendix 3-6, Table A3.2-6.2) showed that the majority of the partial correlations were low as suggested by Field (2009) and Tabachnick and Fidell (2007), indicating that the data set was appropriate for exploratory factor analysis.

5.10.1.3 Bartlett's Test of Sphericity (Primary Dimensions)

Table 5-26 Bartlett's Test (Primary Dimensions)

Bartlett's Test of Sphericity	Approx. Chi-Square	1771.382
	df	210
	Sig.	.000

The value of Bartlett's test was statistically significant (sig. < 0.05) as suggested by Pallant (2010) and Hinton et al. (2004), indicating that the data set was appropriate for exploratory factor analysis.

5.10.1.4 Kaiser-Meyer-Olkin Measure of Sampling Adequacy (Primary Dimensions)

The Kaiser-Meyer-Olkin measure of sampling adequacy index was 0.893. The KMO value of 0.893 exceeded the cut-off level of 0.60 (Tabachnick & Fidell, 2007) and was greater than 0.80, which is defined by Kaiser and Rice (1974) as "meritorious", indicating that the data set was appropriate for exploratory factor analysis.

5.10.2 Results of Exploratory Factor Analysis for the Four Primary Dimensions

The results of the tests for determining appropriateness of exploratory factor analysis for the four primary dimensions indicated that the Sample One data set was appropriate for exploratory factor analysis. Consequently, principle component factor analysis was conducted on all of the items measuring primary dimensions that were generated from the information gathered from the focus groups and the literature review.

5.10.2.1 Latent Root Criterion (Primary Dimensions)

The result of the latent root criterion (see Appendix 7, Table A7.3) showed four factors with Eigenvalues greater than one were generated, so this criterion supported the presence of four factors or components. Therefore, four primary dimensions were extracted from the 21 variables submitted for EFA.

5.10.2.2 Percentage of Variance Criterion (Primary Dimensions)

The four primary dimensions extracted explained approximately 69.63% of the variation in the data set. The variation explained was above 60% as suggested by Hair et al. (2010) (See Appendix 7, Table A7.3).

5.10.2.3 Scree Test Criterion (Primary Dimensions)

By laying a straight edge across the bottom portion of the roots, there were 4 dimensions before the curve became approximately a straight line (See Figure 5-5), indicating that the extraction of 4 dimensions was appropriate for this analysis (Osborne & Costello, 2005; Stewart, 1981).

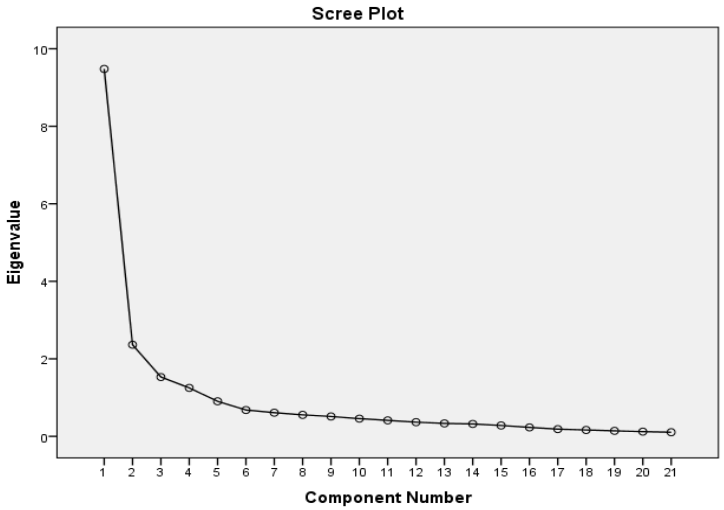


Figure 5-5 Scree Plot (Primary Dimensions)

5.10.2.4 Factor Rotation (Primary Dimensions)

The VARIMAX and the OBLIMIN rotations demonstrated a similar pattern for all 21 items. However, the VARIMAX rotation produced a better structure in terms of the content validity of the factors. Therefore, the final factor structure was based on the factor loadings from the VARIMAX rotation. In addition, the output of an Oblique rotation is more difficult to interpret (Tabachnick & Fidell, 2007).

5.10.2.5 Factor Interpretation (Primary Dimensions)

All of the 21 items that had significant loadings above 0.5 were retained in the analysis. The 21 items loaded on 4 factors respectively: Interaction Quality (6 items), Physical Environment Quality (5 items), Outcome Quality (5 items), and Social Factors Quality (5 items). Factor loading values ranged from 0.519 to 0.858 (see Table 5-27).

5.10.2.6 Unidimensionality Analysis (Primary Dimensions)

Any items that highly load on more than one factor should be eliminated in order to ensure an adequate unidimensionality. All items highly loaded on a single factor, indicating an adequate unidimensionality among the items (Bernard, 2000). The outcome of this process resulted in 21 variables that represented 4 factors in the analysis.

5.10.2.7 Reliability and Validity (Primary Dimensions)

5.10.2.7.1 Reliability (Primary Dimensions)

The 21 variables were subjected to reliability tests. Reliability was measured with Cronbach's coefficient alpha. All factors had a Cronbach's coefficient alpha greater than .70 as suggested by Nunnally and Bernstein (1994). Table 5.27 presents the summary results of reliability tests.

Table 5-27 Reliability of Scaled Items for the four primary dimensions

Dimensions	Cronbach's Coefficient Alphas	Items Nos.	Rotation Loadings
Interaction Quality	0.850	IQ1	0.803
		IQ2	0.761
		IQ3	0.695
		IQ5	0.571
		IQ6	0.763
		IQ7	0.519
Physical Environment Quality	0.850	PEQ1	0.800
		PEQ2	0.661
		PEQ3	0.705
		PEQ4	0.742
		PEQ5	0.679
Outcome Quality	0.926	OQ1	0.795
		OQ2	0.858
		OQ3	0.751
		OQ4	0.805
		OQ5	0.793
Social Factors Quality	0.914	SFQ1	0.721
		SFQ2	0.758
		SFQ3	0.823
		SFQ4	0.626
		SFQ5	0.796

5.10.2.7.2 Validity (Primary Dimensions)

The 21 variables loaded on 4 factors as predicted from the results of the literature review and the focus group discussions. Therefore, the researcher concluded that the measurement instrument for the primary dimensions exhibited adequate content validity (Litwin, 1995; Bollen, 2014; Constantin & Voicu, 2015).

5.11 Confirmatory Factor Analysis

The confirmatory factor analysis was applied to examine the relationship between the four primary dimensions of service quality (Interaction Quality, Physical Environment Quality, Outcome Quality, and Social Factors Quality) and their measurement items. This process is to confirm the classification of the primary dimensions found in the EFA. The CFA procedure for the four primary dimensions encompasses two steps: assessing the individual measurement model for each construct and performing CFA for the four constructs simultaneously to examine whether these four constructs are correlated (Brown, 2015; Hair et al., 2010).

5.11.1 Confirmatory Factor Analysis for Four Primary Dimensions of Service Quality

The following section provides the results of confirmatory factor analysis for Four Primary Dimensions of Service Quality.

5.11.1.1 Measurement Model for Interaction Quality

The preliminary measurement model for Interaction Quality as illustrated in Measurement Model 1 (see Figure 4-1) was designed to examine the relationships between one primary dimension of service quality (Interaction Quality) and their observed indicators (see Figure 5-6).

Based on the result of the EFA, there were 6 items for measuring Interaction Quality (see Figure 5-6). The preliminary measurement model for Interaction Quality presented with 6 items which were ν = 21 pieces of information (6[6+1]/2 = 21) and the number of estimated parameters were p = 12 parameters (5 Regression weights, 7 variances).

Based on the t-rule (Bollen, 2014; Kelloway, 1998), the preliminary measurement model for Interaction Quality was over-identified (the number of observed variances and covariances were greater than the number of estimated parameters) with 9 degrees of freedom (*df)* (21 pieces of information - 12 parameters).

The result of the preliminary measurement model for Interaction Quality (the standardized factor loadings ranged from 0.623 to 0.822) indicated that all items had a factor loading above the recommended threshold of 0.60. All items were statistically significant at the .001% level, indicating unidimensionality among the items (Bagozzi & Yi, 1988; Hair et al., 2010; Janssens et al., 2008).

However, one of the model fit indices for the preliminary measurement model for Interaction Quality: the Root Mean Square Error of Approximation (RMSEA) was below the recommended thresholds (see Table 5-28). Therefore, some modifications were required in

order to improve the model fit (Byrne, 2010; Chinna, 2009; Hair et al., 2010; Kline, 2005; Nokelainen, 2009; Schumacker & Lomax, 2004).

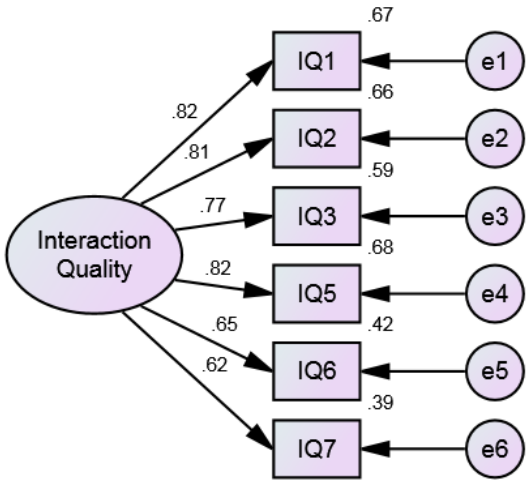


Figure 5-6 The Preliminary Measurement Model for Interaction Quality

Table 5-28 Goodness-of Fit Results of the Preliminary Measurement Model for Interaction Quality

Goodness-of Fit Indices	Values
Chi-Square ($\mathcal{X}^2$)	28.033
Degree of Freedom (*df*)	9
Normed Chi-square ($\mathcal{X}^2/df$)	3.115
Goodness-of-Fit Indices (GFI)	0.964
Root Mean Residual (RMR)	0.065
Comparative Fit Index (CFI)	0.975
Normed Fit Index (NFI)	0.963
Root Mean Square Error of Approximation (RMSEA)	0.092

The Modification Index (MI) revealed that the pair of items IQ6 and IQ7 was considered higher than the recommended threshold of 15 which indicated that these two items were redundant items in the measurement model for Interaction Quality (Awang, 2012; Lawrence et al., 2013). As far as the factor loadings and the MI value report were concerned, the model was first re-specified by deleting IQ7 as it had a lower factor loading and a high MI value (Awang, 2012; Bagozzi & Yi, 1988; Hair et al., 2010; Lawrence et al., 2013) (see Table 5-29).

Table 5-29 Suggestion for Improving Model-Fit-Indices from MI

Items	Suggestions from Modification Index	Modification Index	Expected Par Change
Covariances			
e5 <-----> e6		15.176	0.287
(IQ6) (IQ7)			
Regression weights			
IQ7 <--- IQ6		8.170	0.161
IQ6 <--- IQ7		8.732	0.135

After eliminating item IQ7, there were 5 measurement items for Interaction Quality (see Figure 5-7). The modified measurement model for Interaction Quality presented with 5 items which were $\nu = 15$ pieces of information (5[5+1]/2 = 15) and the number of estimated parameters were $p = 10$ parameters (4 Regression weights, 6 variances).

Based on the t-rule (Bollen, 2014; Kelloway, 1998), the preliminary measurement model for Interaction Quality was over-identified (the number of observed variances and covariances were greater than the number of estimated parameters) with 5 degrees of freedom (*df)* (15 pieces of information - 10 parameters).

After the re-specification process, the modified measurement model for Interaction Quality had a good model fit to the sample data. Initially, all factor loadings for the measurement items in the model were above the recommended threshold value of 0.60 and statistically significant at the .001% level (Bagozzi &Yi., 1988; Hair et al., 2010; Janssens et al., 2008) (see Figure 5-7).

Subsequently, the improvement in the model fit was examined by subtracting the overall χ^2 statistic for the modified model from the preliminary model. Comparing the preliminary model ($\chi^2_{[9]} = 28.033$) with the modified model ($\chi^2_{[5]} = 10.755$) yielded a difference in the χ^2 value of 17.278 ($\Delta\chi^2_{[4]} = 17.278$). Since $\Delta\chi^2_{[4]} = 17.278 > \chi^2{}_{9.488,\alpha.05}$, the modified first-order model was statistically significant and indicated an improvement in the model-fit-indices.

After the re-specification process, all of the model fit indices were improved and sufficiently satisfied their relevant recommended thresholds, especially the RMSEA which had been unacceptable in the preliminary model. These indices suggest a good model fit to the sample data in the modified model (see Table 5-30) (Byrne, 2010; Hair et al., 2010).

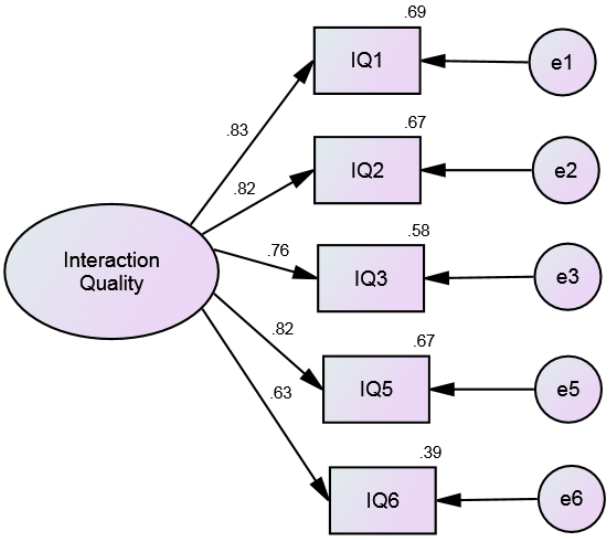


Figure 5-7 The Modified Measurement Model for Interaction Quality

Table 5-30 Goodness-of-Fit Results of the Modified Measurement Model for Interaction Quality

Goodness-of Fit Indices	Values
Chi-Square ($\mathcal{X}^2$)	10.755
Degree of Freedom (*df*)	5
Normed Chi-square ($\mathcal{X}^2/df$)	2.151
Goodness-of-Fit Indices (GFI)	0.983
Root Mean Residual (RMR)	0.033
Comparative Fit Index (CFI)	0.991
Normed Fit Index (NFI)	0.983
Root Mean Square Error of Approximation (RMSEA)	0.068

Moreover, as suggested in the literature (Byrne, 2010; Hair et al., 2010; Janssens et al., 2008; Kline, 2011; Schumacker & Lomax, 2004), verifying construct validity and reliability are required for a measurement model before modelling the structural model. In this study, the construct validity was verified by examining the unidimensionality, which is recommended by Byrne (2010) as a prerequisite indicator of construct validity and reliability. Then the construct validity was reconfirmed by examining convergent validity and discriminant validity, while reliability was verified by examining average variance extracted (AVE) and composite reliability. As far as all criteria were concerned, the measurement model for Interaction Quality shows adequate construct validity and reliability.

The CFI index was 0.991 which was above the recommended threshold of 0.90 (Byrne, 2010), indicating that the measure model for Interaction Quality demonstrates adequate undimensionality (see Table 5-30).

All standardized factor loadings of all measurement items were statistically significant (t-values > 1.96), and ranged from 0.63 to 0.83, which were above the recommended threshold value of 0.60 (Bagozzi & Yi, 1988). Thus, the measurement model for Interaction Quality demonstrates adequate convergent validity (see Table 5-31). In addition, the AVE of the Interaction Quality primary dimension was 0.60, which was above the recommended threshold 0.50 (Fornell & Larcker, 1981), hence the model also shows adequate convergent validity (see Table 5-32).

The composite reliability of the Interaction Quality primary dimension was 0.88, which was above the recommended threshold of 0.70 (Kline, 2011; Nunnally, 1978), therefore this model exhibits adequate reliability (see Table 5-32).

Table 5-31 Standardized Solution of Modified Measurement Model for Interaction Quality

Variable Label	Factor Loading
IQ1	0.829***
IQ2	0.821(14.874) ***
IQ3	0.763(13.136) ***
IQ5	0.821(14.478) ***
IQ6	0.628(10.233) ***

( ) t Value

*** Statistically significant at the 0.001 level (t>3.291)
**Statistically significant at the 0.01 level (t>2.576)
*Statistically significant at the 0.1 level (t>1.645)

Table 5-32 Average Variance Extracted and Construct Reliability Results of the Modified Measurement Model for Interaction Quality

Variable Label	Construct Reliability	Average Variance Extracted
Interaction Quality	0.882	0.602

5.11.1.2 Measurement Model for Physical Environment Quality

The preliminary measurement model for Physical Environment Quality as illustrated in Measurement Model 2 (see Figure 4-2) was designed to examine the relationships between one primary dimension of service quality (Physical Environment Quality) and its observed indicators (see Figure 5-8).

Based on the result of the EFA, there were 5 items for measuring Physical Environment Quality (see Figure 5-8). The preliminary measurement model for Physical Environment Quality presented 5 items: which were ν = 15 pieces of information (5[5+1]/2 = 15) and the number of estimated parameters were p = 10 parameters (4 regression weights, 6 variances).

Based on the t-rule (Bollen, 2014; Kelloway, 1998), the preliminary measurement model for Physical Environment Quality was over-identified (the number of observed variances and covariances were greater than the number of estimated parameters) with 5 degrees of freedom (*df)* (15 pieces of information - 10 parameters).

The result of the preliminary measurement model for Physical Environment Quality (the standardized factor loadings ranged from 0.642 to 0.864) indicated that all items had a factor loading above the recommended threshold of 0.60. All items were statistically significant at the .001% level, indicating unidimensionality among the items (Bagozzi & Yi, 1988; Hair et al., 2010; Janssens et al., 2008).

However, some of the model fit indices for the preliminary measurement model for Physical Environment Quality: the Normed Chi-square ($\mathcal{X}^2/df$), and the Root Mean Square Error of Approximation (RMSEA) were below the recommended thresholds (see Table 5-33). Therefore, some modifications were required in order to improve the model fit (Byrne, 2010; Chinna, 2009; Hair et al., 2010; Kline, 2005; Nokelainen, 2009; Schumacker & Lomax, 2004).

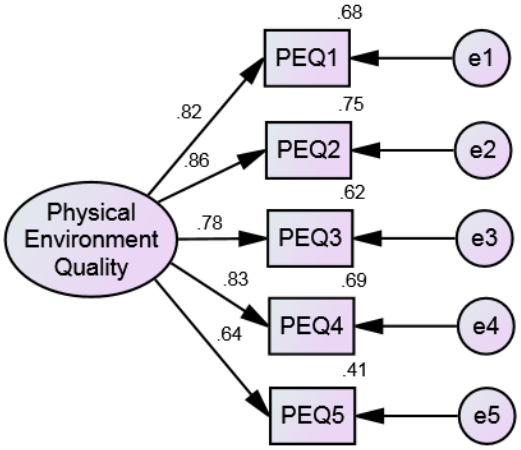


Figure 5-8 The Preliminary Measurement Model for Physical Environment Quality

Table 5-33 Goodness-of Fit Results of the Preliminary Measurement Model for Physical Environment Quality

Goodness-of Fit Indices	Values
Chi-Square ($\mathcal{X}^2$)	46.977
Degree of Freedom (*df*)	5
Normed Chi-square ($\mathcal{X}^2/df$)	9.395
Goodness-of-Fit Indices (GFI)	0.923
Root Mean Residual (RMR)	0.096
Comparative Fit Index (CFI)	0.943
Normed Fit Index (NFI)	0.937
Root Mean Square Error of Approximation (RMSEA)	0.184

The Modification Index (MI) revealed that the MI value between items PEQ1 and PEQ2 were considered higher than the recommended threshold of 15, which indicated that these two items were redundant in the measurement model for Physical Environment Quality (Awang, 2012; Lawrence et al., 2013). As far as the factor loadings and the MI value report were concerned, the model was first re-specified by deleting PEQ1 as it had a lower factor loading and a high MI value (Awang, 2012; Bagozzi & Yi, 1988; Hair et al., 2010; Lawrence et al., 2013) (see Table 5-34).

Table 5-34 Suggestion for Improving Model-Fit-Indices from MI

Items	Suggestions from Modification Index	Modification Index	Expected Par Change
Covariances			
e1 <-----> e2		23.185	0.235
(PEQ1) (PEQ2)			
Regression weights			
PEQ2 <--- PEQ1		6.531	0.083
PEQ1 <--- PEQ2		4.647	0.100

After eliminating item PEQ1, there were 4 measurement items for Physical Environment Quality (see Figure 5-9). The modified measurement model for Physical Environment Quality presented with 4 items which were ν = 10 pieces of information (4[4+1]/2 = 10) and the number of estimated parameters were *p* = 8 parameters (3 Regression weights, 5 variances).

Based on the t-rule (Bollen, 2014; Kelloway, 1998), the preliminary measurement model for Physical Environment Quality was over-identified (the number of observed variances and covariances were greater than the number of estimated parameters) with 2 degrees of freedom (*df)* (10 pieces of information - 8 parameters). After the re-specification process, the modified measurement model for Physical Environment Quality had a good model fit to the sample data. Initially, all factor loadings for the measurement items in the model were above the recommended threshold value of 0.60 and statistically significant at the .001% level (Bagozzi &Yi, 1988; Hair et al., 2010; Janssens et al., 2008) (see Figure 5-9).

Subsequently, the improvement in the model fit was examined by subtracting the overall χ^2 statistic for the modified model from the preliminary model. Comparing the preliminary model ($\chi^2_{[5]}$ = 46.977) with the modified model ($\chi^2_{[2]}$ = 2.104) yielded a difference in the χ^2 value of 17.278 ($\Delta\chi^2_{[3]}$ = 44.873). Since $\Delta\chi^2_{[3]}$ = 44.873 > $\chi^2{}_{5.991,\alpha.05}$, the modified first-order model was statistically significant and indicated an improvement in the model-fit-indices.

After the re-specification process, all of the model fit indices were improved and sufficiently satisfied their relevant recommended thresholds, especially the Normed Chi-square and the RMSEA which

had been unacceptable in the preliminary model. These indices suggest a good model fit to the sample data in the modified model (Byrne, 2010; Hair et al., 2010) (see Table 5-35).

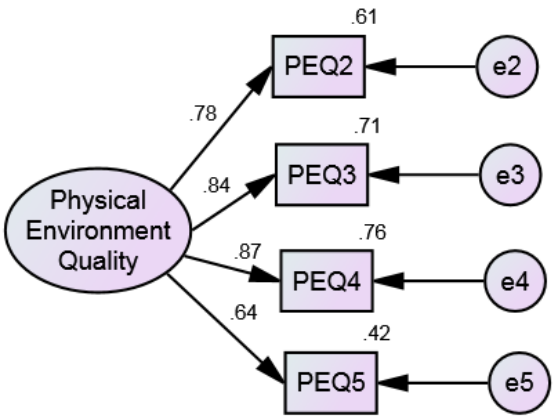


Figure 5-9 The Modified Measurement Model for Physical Environment Quality

Table 5-35 Goodness-of-Fit Results of the Modified Measurement Model for Physical Environment Quality

Goodness-of Fit Indices	Values
Chi-Square ($\mathcal{X}^2$)	2.104
Degree of Freedom (*df*)	2
Normed Chi-square ($\mathcal{X}^2/df$)	1.052
Goodness-of-Fit Indices (GFI)	0.996
Root Mean Residual (RMR)	0.025
Comparative Fit Index (CFI)	1.000
Normed Fit Index (NFI)	0.996
Root Mean Square Error of Approximation (RMSEA)	0.014

Moreover, as suggested in the literature (Byrne, 2010; Hair et al., 2010; Janssens et al., 2008; Kline, 2011; Schumacker & Lomax, 2004), verifying construct validity and reliability are required for a measurement model before modelling the structural model. In this study, the construct validity was verified by examining the unidimensionality, which is recommended by Byrne (2010) as a prerequisite indicator of construct validity and reliability. Then the construct validity was reconfirmed by examining convergent validity and discriminant validity, while reliability was verified by examining average variance extracted (AVE) and composite reliability. As far as all criteria were concerned, the measurement model for Physical Environment Quality shows adequate construct validity and reliability.

The CFI index was 1.000 which was above the recommended threshold of 0.90 (Byrne, 2010), indicating that the measure model for Physical Environment Quality demonstrates adequate undimensionality (see Table 5-35).

All of the standardized factor loadings for all measurement items were statistically significant (t-values > 1.96), and ranged from 0.65 to 0.87, which were above the recommended threshold value of 0.60 (Bagozzi & Yi, 1988). Thus, the measurement model for Physical Environment Quality demonstrates adequate convergent validity (see Table 5-36). In addition, the AVE of the Physical Environment Quality primary dimension was 0.623, which was above the recommended threshold 0.50 (Fornell & Larcker, 1981), hence the model also shows adequate convergent validity (see Table 5-37).

The composite reliability of the Physical Environment Quality primary dimension was 0.867, which was above the recommended threshold of 0.70 (Kline, 2011; Nunnally, 1978), therefore this model exhibits adequate reliability (see Table 5-37).

Table 5-36 Standardized Solution of Modified Measurement Model for Physical Environment Quality

Variable Label	Factor Loading
PEQ2	0.782***
PEQ3	0.841(13.620) ***
PEQ4	0.871(14.194) ***
PEQ5	0.645(10.248) ***

( ) t Value

*** Statistically significant at the 0.001 level (t>3.291)
**Statistically significant at the 0.01 level (t>2.576)
*Statistically significant at the 0.1 level (t>1.645)

Table 5-37 Average Variance Extracted and Construct Reliability Results of the Modified Measurement Model for Physical Environment Quality

Variable Label	Construct Reliability	Average Variance Extracted
Physical Environment Quality	0.867	0.623

5.11.1.3 Measurement Model for Outcome Quality

The preliminary measurement model for Outcome Quality, as illustrated in Measurement Model 3 (see Figure 4-3), was designed to examine the relationships between one primary dimension of service quality (Outcome Quality) and its observed indicators (see Figure 5-10).

Based on the result of the EFA, there were 5 items for measuring Outcome Quality (see Figure 5-10). The preliminary measurement model for Outcome Quality presented with 5 items which were $\nu = 15$

pieces of information (5[5+1]/2 = 15) and the number of estimated parameters were *p* = 10 parameters (4 Regression weights, 6 variances).

Based on the t-rule (Bollen, 2014; Kelloway, 1998), the preliminary measurement model for Outcome Quality was over-identified (the number of observed variances and covariances were greater than the number of estimated parameters) with 5 degrees of freedom (*df)* (15 pieces of information - 10 parameters).

The result of the preliminary measurement model for Outcome Quality (the standardized factor loadings ranged from 0.76 to 0.91) indicated that all items had a factor loading above the recommended threshold of 0.60. All items were statistically significant at the .001% level, indicating unidimensionality among the items (Bagozzi & Yi, 1988; Hair et al., 2010; Janssens et al., 2008).

However, some of the model fit indices for the preliminary measurement model for Outcome Quality: the Normed Chi-square ($\mathcal{X}^2/df$), the Goodness-of-Fit Indices (GFI), and the Root Mean Square Error of Approximation (RMSEA) were below the recommended thresholds (see Table 5-38). Therefore, some modifications were required in order to improve the model fit (Byrne, 2010; Chinna, 2009; Hair et al., 2010; Kline, 2005; Nokelainen, 2009; Schumacker & Lomax, 2004).

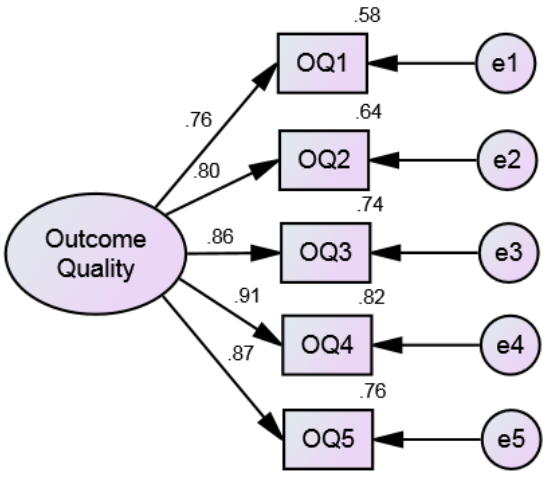


Figure 5-10 The Preliminary Measurement Model for Outcome Quality

Table 5-38 Goodness-of Fit Results of the Preliminary Measurement Model for Outcome Quality

Goodness-of Fit Indices	Values
Chi-Square ($\mathcal{X}^2$)	92.341
Degree of Freedom (*df*)	5
Normed Chi-square ($\mathcal{X}^2/df$)	18.468
Goodness-of-Fit Indices (GFI)	0.872
Root Mean Residual (RMR)	0.098
Comparative Fit Index (CFI)	0.913
Normed Fit Index (NFI)	0.909
Root Mean Square Error of Approximation (RMSEA)	0.265

The Modification Index (MI) revealed that the MI value between items OQ1 and OQ2 was considered higher than the recommended threshold of 15, which indicated that these two items were redundant items in the measurement model for Outcome Quality (Awang, 2012; Lawrence et al., 2013). The MI value between OQ2 and OQ5 was higher than the MI value between OQ1 and OQ5, while the MI value between OQ2 and OQ4 was higher than the MI value between OQ1 and OQ4. Therefore, the model was first re-specified by deleting OQ2 as it had a higher MI value (Awang, 2012; Bagozzi & Yi, 1988; Hair et al., 2010; Lawrence et al., 2013) (see Table 5-39).

Table 5-39 Suggestion for Improving Model-Fit-Indices from MI

Items	Suggestions from Modification Index	Modification Index	Expected Par Change
Covariances			
e1 <-----> e2		75.765	0.424
(OQ1) (OQ2)			
e2 <-----> e5		9.561	-0.116
(OQ2) (OQ5)			
e2 <-----> e4		7.570	-0.098
(OQ2) (OQ4)			
e1 <-----> e5		8.150	-0.114
(OQ1) (OQ5)			
e1 <-----> e4		6.159	-0.094
(OQ1) (OQ4)			
Regression weights			
OQ2 <--- OQ1		29.043	0.220
OQ1 <--- OQ2		24.350	0.211

After eliminating item OQ2, there were 4 measurement items for Outcome Quality (see Figure 5-11). The modified measurement model for Outcome Quality presented with 4 items which were ν = 10 pieces of information (4[4+1]/2 = 10) and the number of estimated parameters were *p* = 8 parameters (3 Regression weights, 5 variances).

Based on the t-rule (Bollen, 2014; Kelloway, 1998), the preliminary measurement model for Outcome Quality was over-identified (the number of observed variances and covariances were greater than the number of estimated parameters) with 2 degrees of freedom (*df)* (10 pieces of information - 8 parameters). After the re-specification process, the modified measurement model for Outcome Quality had a good model fit to the sample data. Initially, all factor loadings for the measurement items in the model were above the recommended threshold value of 0.60 and statistically significant at the .001% level (Bagozzi &Yi, 1988; Hair et al., 2010; Janssens et al., 2008) (see Figure 5-11).

Subsequently, the improvement in the model fit was examined by subtracting the overall χ^2 statistic for the modified model from the preliminary model. Comparing the preliminary model ($\chi^2_{[5]}$ = 92.341) with the modified model ($\chi^2_{[2]}$ = 2.393) yielded a difference in the χ^2 value of 17.278 ($\Delta\chi^2_{[3]}$ = 89.948). Since $\Delta\chi^2_{[3]}$ = 89.948 > $\chi^2{}_{5.991,\alpha.05}$, the modified first-order model was statistically significant and indicated an improvement in the model-fit-indices.

After the re-specification process, all of the model fit indices were improved and sufficiently satisfied their relevant recommended thresholds, especially the Normed Chi-square, the GFI and the RMSEA which had been unacceptable in the preliminary model. These indices suggest a good model fit to the sample data in the modified model (Byrne, 2010; Hair et al., 2010) (see Table 5-40).

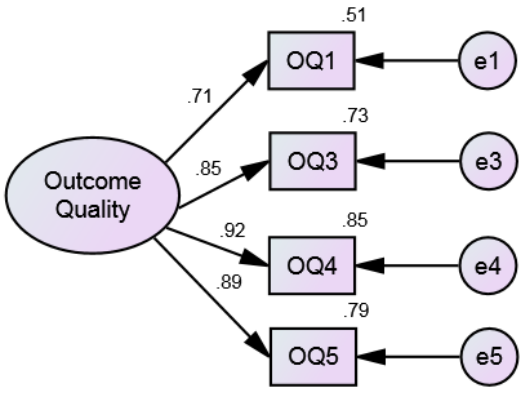


Figure 5-11 The Modified Measurement Model for Outcome Quality

Table 5-40 Goodness-of-Fit Results of the Modified Measurement Model for Outcome Quality

Goodness-of Fit Indices	Values
Chi-Square ($\mathcal{X}^2$)	2.393
Degree of Freedom (*df*)	2
Normed Chi-square ($\mathcal{X}^2/df$)	1.196
Goodness-of-Fit Indices (GFI)	0.995
Root Mean Residual (RMR)	0.018
Comparative Fit Index (CFI)	0.999
Normed Fit Index (NFI)	0.997
Root Mean Square Error of Approximation (RMSEA)	0.028

Moreover, as suggested in the literature (Byrne, 2010; Hair et al., 2010; Janssens et al., 2008; Kline, 2011; Schumacker & Lomax, 2004), verifying construct validity and reliability are required for a measurement model before modelling the structural model. In this study, the construct validity was verified by examining the unidimensionality, which is recommended by Byrne (2010) as a prerequisite indicator of construct validity and reliability. Then the construct validity was reconfirmed by examining convergent validity and discriminant validity, while reliability was verified by examining average variance extracted (AVE) and composite reliability. As far as all criteria were concerned, the measurement model for Outcome Quality shows adequate construct validity and reliability.

The CFI index was 0.999 which was above the recommended threshold of 0.90 (Byrne, 2010), indicating that the measure model for Outcome Quality demonstrates adequate undimensionality (see Table 5-40). All of the standardized factor loadings of all measurement items were statistically significant (t-values > 1.96), and ranged from 0.71 to 0.92, which were above the recommended threshold value of 0.60 (Bagozzi & Yi, 1988). Thus, the measurement model for Outcome Quality demonstrates adequate convergent validity (see Table 5-41). In addition, the AVE of the Outcome Quality primary dimension was 0.72, which was above the recommended threshold 0.50 (Fornell & Larcker, 1981), hence the model also shows adequate convergent validity (see Table 5-42).

The composite reliability of the Outcome Quality primary dimension was 0.91, which was above the recommended threshold of 0.70 (Kline, 2011; Nunnally, 1978), therefore this model exhibits adequate reliability (see Table 5-42).

Table 5-41 Standardized Solution of Modified Measurement Model for Outcome Quality

Variable Label	Factor Loading
OQ1	0.713***
OQ3	0.853(13.067) ***
OQ4	0.925(13.938) ***
OQ5	0.889(13.471) ***

( ) t Value

*** Statistically significant at the 0.001 level (t>3.291)

**Statistically significant at the 0.01 level (t>2.576)

*Statistically significant at the 0.1 level (t>1.645)

Table 5-42 Average Variance Extracted and Construct Reliability Results of the Modified Measurement Model for Outcome Quality

Variable Label	Construct Reliability	Average Variance Extracted
Outcome Quality	0.911	0.721

5.11.1.4 Measurement Model for Social Factors Quality

The preliminary measurement model for Social Factors Quality as illustrated in Measurement Model 4 (see Figure 4-4) was designed to examine the relationships between one primary dimension of service quality (Social Factors Quality) and its observed indicators (see Figure 5-12).

Based on the result of the EFA, there were 5 items measuring Social Factors Quality (see Figure 5-12). The preliminary measurement model for Social Factors Quality presented with 5 items which were ν = 15 pieces of information (5[5+1]/2 = 15) and the number of estimated parameters were *p* = 10 parameters (4 Regression weights, 6 variances).

Based on the t-rule (Bollen, 2014; Kelloway, 1998), the preliminary measurement model for Social Factors Quality was over-identified (the number of observed variances and covariances were greater than the number of estimated parameters) with 5 degrees of freedom (*df)* (15 pieces of information - 10 parameters).The result of the preliminary measurement model for Social Factors Quality (the standardized factor loadings ranged from 0.732 to 0.906) indicated that all items had a factor loading above the recommended threshold of 0.60. All items were statistically significant at the .001% level, indicating unidimensionality among the items (Bagozzi & Yi, 1988; Hair et al., 2010; Janssens et al., 2008).

However, some of the model fit indices for the preliminary measurement model for Social Factors Quality: the Normed Chi-square ($\mathcal{X}^2/df$), and the Root Mean Square Error of Approximation (RMSEA) were below the recommended thresholds (see Table 5-43). Therefore, some modifications were required in order to improve the model fit (Byrne, 2010; Chinna, 2009; Hair et al., 2010; Kline, 2005; Nokelainen, 2009; Schumacker & Lomax, 2004).

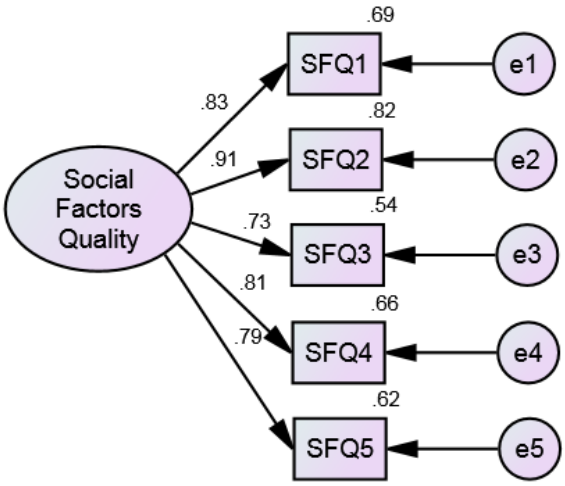


Figure 5-12 The Preliminary Measurement Model for Social Factors Quality

Table 5-43 Goodness-of Fit Results of the Preliminary Measurement Model for Social Factors Quality

Goodness-of Fit Indices	Values
Chi-Square ($\mathcal{X}^2$)	43.381
Degree of Freedom (*df*)	5
Normed Chi-square ($\mathcal{X}^2/df$)	8.676
Goodness-of-Fit Indices (GFI)	0.925
Root Mean Residual (RMR)	0.069
Comparative Fit Index (CFI)	0.954
Normed Fit Index (NFI)	0.948
Root Mean Square Error of Approximation (RMSEA)	0.176

The Modification Index (MI) revealed that the MI value between items SFQ1 and SFQ2 was considered higher than the recommended threshold of 15, which indicated that these two items were redundant items in the measurement model for Social Factors Quality (Awang, 2012; Lawrence et al., 2013). The MI Index also showed that item SFQ1 was paired with SFQ3, SFQ4, and SFQ5 respectively. As far as the factor loadings and the MI value report were concerned, the model was first re-specified by deleting SFQ1 as it had a lower factor loading and a high MI value (Awang, 2012; Bagozzi & Yi, 1988; Hair et al., 2010; Lawrence et al., 2013) (see Table 5-44).

Table 5-44 Suggestion for Improving Model-Fit-Indices from MI

Items	Suggestions from Modification Index	Modification Index	Expected Par Change
Covariances			
e1 <-----> e2		21.653	0.173
(SFQ1) (SFQ2)			
e1 <-----> e3		4.006	-0.103
(SFQ1) (SFQ3)			
e1 <-----> e4		4.098	-0.086
(SFQ1) (SFQ4)			
e1 <-----> e5		9.314	-0.133
(SFQ1) (SFQ5)			
Regression weights			
SFQ2 <--- SFQ1		6.128	0.091

After eliminating item SFQ1, there were 4 measurement items for Social Factors Quality (see Figure 5-13). The modified measurement model for Social Factors Quality presented with 4 items which were ν = 10 pieces of information (4[4+1]/2 = 10) and the number of estimated parameters were *p* = 8 parameters (3 Regression weights, 5 variances).

Based on the t-rule (Bollen, 2014; Kelloway, 1998), the preliminary measurement model for Social Factors Quality was over-identified (the number of observed variances and covariances were greater than the number of estimated parameters) with 2 degrees of freedom (*df)* (10 pieces of information - 8 parameters). After the re-specification process, the modified measurement model for Social Factors Quality had a good model fit to the sample data. Initially, all factor loadings for the measurement items in the model were above the recommended threshold value of 0.60 and statistically significant at the .001% level (Bagozzi &Yi, 1988; Hair et al., 2010; Janssens et al., 2008) (see Figure 5-13).

Subsequently, the improvement in the model fit was examined by subtracting the overall χ^2 statistic for the modified model from the preliminary model. Comparing the preliminary model ($\chi^2_{[5]}$ = 43.381) with the modified model ($\chi^2_{[2]}$ = 0.410) yielded a difference in the χ^2 value of 42.971 ($\Delta\chi^2_{[3]}$ = 42.971). Since $\Delta\chi^2_{[3]}$ = 42.971 > $\chi^2{}_{5.991,\alpha.05}$, the modified first-order model was statistically significant and indicated an improvement in the model-fit-indices.

After the re-specification process, all of the model fit indices were improved and sufficiently satisfied their relevant recommended thresholds, especially the Normed Chi-square ($\mathcal{X}^2/df$) and the RMSEA which had been unacceptable in the preliminary model. These indices suggest a good model fit to the sample data in the modified model (Byrne, 2010; Hair et al., 2010) (see Table 5-45).

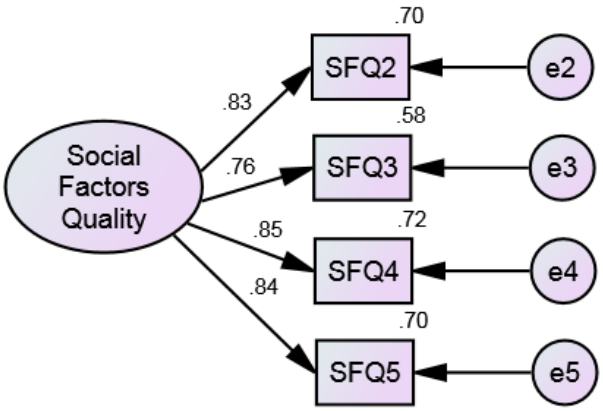


Figure 5-13 The Modified Measurement Model for Social Factors Quality

Table 5-45 Goodness-of-Fit Results of the Modified Measurement Model for Social Factors Quality

Goodness-of Fit Indices	Values
Chi-Square ($\mathcal{X}^2$)	0.410
Degree of Freedom (*df*)	2
Normed Chi-square ($\mathcal{X}^2/df$)	0.205
Goodness-of-Fit Indices (GFI)	0.999
Root Mean Residual (RMR)	0.008
Comparative Fit Index (CFI)	1.000
Normed Fit Index (NFI)	0.999
Root Mean Square Error of Approximation (RMSEA)	0.000

Moreover, as suggested in the literature (Byrne, 2010; Hair et al., 2010; Janssens et al., 2008; Kline, 2011; Schumacker & Lomax, 2004), verifying construct validity and reliability are required for a measurement model before modelling the structural model. In this study, the construct validity was verified by examining the unidimensionality, which is recommended by Byrne (2010), as a prerequisite indicator of construct validity and reliability. Then the construct validity was reconfirmed by examining convergent validity and discriminant validity, while reliability was verified by examining average variance extracted (AVE) and composite reliability. As far as all criteria were concerned, the measurement model for Social Factors Quality shows adequate construct validity and reliability.

The CFI index was 1.000 which was above the recommended threshold of 0.90 (Byrne, 2010), indicating that the measure model for Social Factors Quality demonstrates adequate undimensionality (see Table 5-45). All of the standardized factor loadings of all measurement items were statistically significant (t-values > 1.96), and ranged from 0.76 to 0.85, which were above the recommended threshold value of 0.60 (Bagozzi & Yi, 1988). Thus, the measurement model for Social Factors Quality demonstrates adequate convergent validity (see Table 5-46). In addition, the AVE of

the Social Factors Quality primary dimension was 0.673, which was above the recommended threshold 0.50 (Fornell & Larcker, 1981), hence the model also shows adequate convergent validity (see Table 5-47).

The composite reliability of the Social Factors Quality primary dimension was 0.892, which was above the recommended threshold of 0.70 (Kline, 2011; Nunnally, 1978), therefore this model exhibits adequate reliability (see Table 5-47).

Table 5-46 Standardized Solution of Modified Measurement Model for Social Factors Quality

Variable Label	Factor Loading
SFQ2	0.834***
SFQ3	0.759(13.355) ***
SFQ4	0.849(15.432) ***
SFQ5	0.837(15.090) ***

( ) t Value

*** Statistically significant at the 0.001 level (t>3.291)
**Statistically significant at the 0.01 level (t>2.576)
*Statistically significant at the 0.1 level (t>1.645)

Table 5-47 Average Variance Extracted and Construct Reliability Results of the Modified Measurement Model for Social Factors Quality

Variable Label	Construct Reliability	Average Variance Extracted
Outcome Quality	0.892	0.673

5.11.1.5 Measurement Model for the Four Primary Dimensions

The measurement model for the four primary dimensions was designed to examine the correlations between the four primary dimensions of service quality (Interaction Quality, Physical Environment Quality, Outcome Quality and Social Factors Quality) (see Figure 5-14).

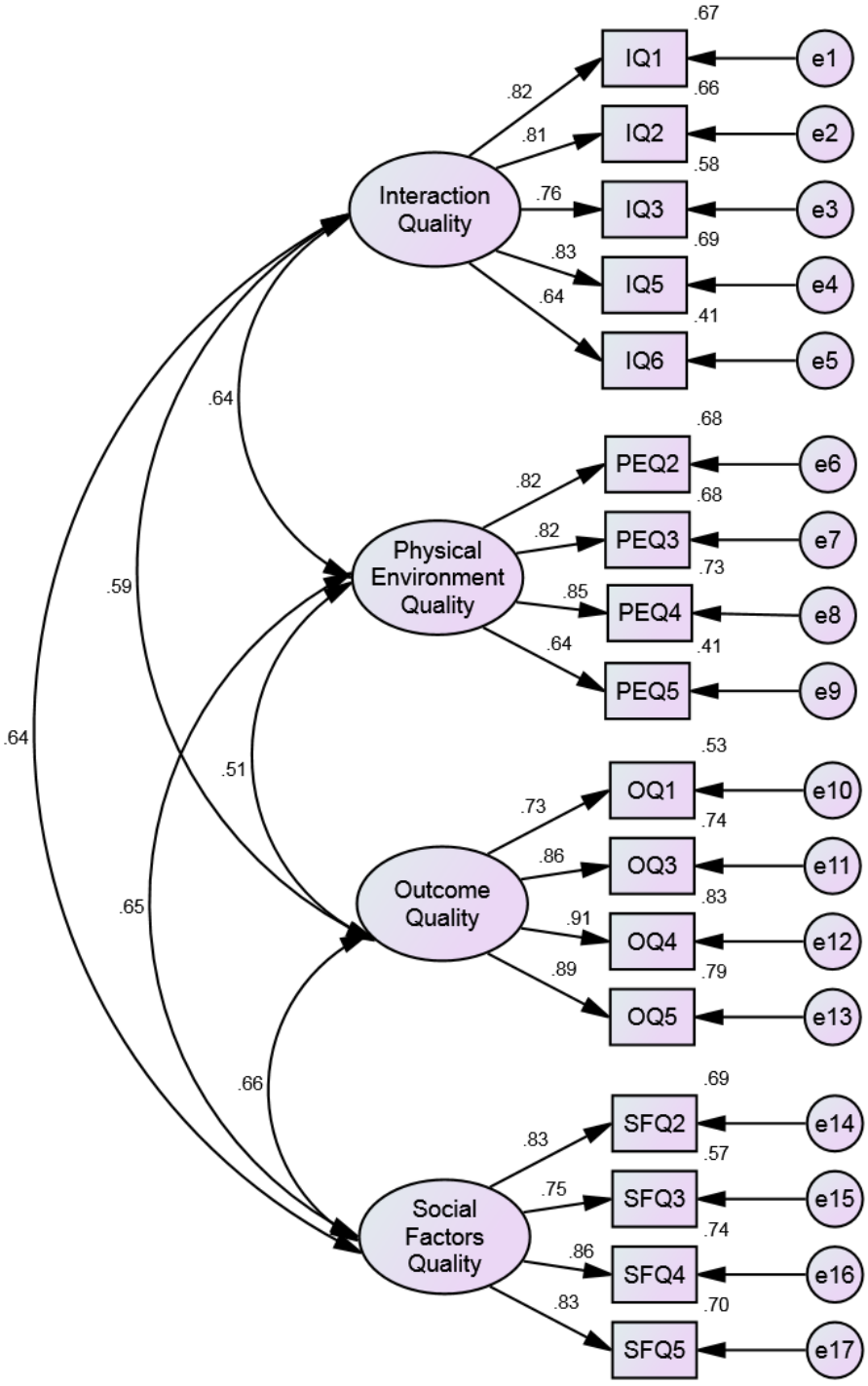


Figure 5-14 The Measurement Model for the Four Primary Dimensions

The correlation coefficients of the four primary dimensions of this model ranged from 0.510 to 0.664, which were below the recommended threshold of 0.85 (Kline, 2011), therefore, the model exhibits adequate discriminant validity (see Table 5-48 or Figure 5-14).

Table 5-48 Correlations of the Measurement Model for the Four Primary Dimensions

Variable Label	Correlation
IQ <-----> PEQ	0.645
PEQ <-----> OQ	0.510
OQ <-----> SFQ	0.664
IQ <-----> OQ	0.585
IQ <-----> SFQ	0.638
PEQ <-----> SFQ	0.650

IQ = Interaction Quality, PEQ = Physical Environment Quality, OQ = Outcome Quality, SFQ = Social Factors Quality

The model-fit results for the measurement model for the four primary dimensions in Table 5-49 indicated a good model fit to the sample data. All model fit indices were sufficiently satisfied with their relative recommended thresholds (Byrne, 2010; Hair et al., 2010) (see Table 5-49). Hence no modification was required for the model.

Table 5-49 Goodness-of-Fit Results of the Measurement Model for the Four Primary Dimensions

Goodness-of Fit Indices	Values
Chi-Square ($\mathcal{X}^2$)	188.024
Degree of Freedom (*df*)	113
Normed Chi-square ($\mathcal{X}^2/df$)	1.664
Goodness-of-Fit Indices (GFI)	0.920
Root Mean Residual (RMR)	0.088
Comparative Fit Index (CFI)	0.973
Normed Fit Index (NFI)	0.936
Root Mean Square Error of Approximation (RMSEA)	0.052

5.11.2 Confirmatory Factor Analysis for Service Quality

The confirmatory factor analysis (CFA) for service quality encompassed two steps: A First-Order and Second-Order CFA. The following sections provide the results of the First-Order and the Second-Order CFA for Service Quality.

5.11.2.1 First-Order Confirmatory Factor Analysis Model for Service Quality

The first-order confirmatory factor analysis model for service quality was designed to examine the relationship between the four primary dimensions of service quality (Interaction Quality, Physical Environment Quality, Outcome Quality, and Social Factors Quality), and their observed indicators (see Figure 5-15).

The first-order CFA model for service quality presented 8 items which were ν = 36 pieces of information (8[8+1]/2 = 36) and the number of estimated parameters were *p* = 22 parameters (4 regression weights, 6 covariances and 12 variances). Based on the t-rule (Bollen, 2014; Kelloway, 1998), the first-order CFA model for service quality was over-identified (the number of observed variances and covariances were greater than the number of estimated parameters) with 14 degrees of freedom (*df)* (36 pieces of information - 22 parameters).

The model-fit results for the first-order CFA model for service quality in Table 5-50 indicated a good model-fit to the sample data. All model fit indices were sufficiently satisfied within their relative recommended thresholds (Byrne, 2010; Hair et al., 2010) (see Table 5-50). Hence, no modification was required for the model.

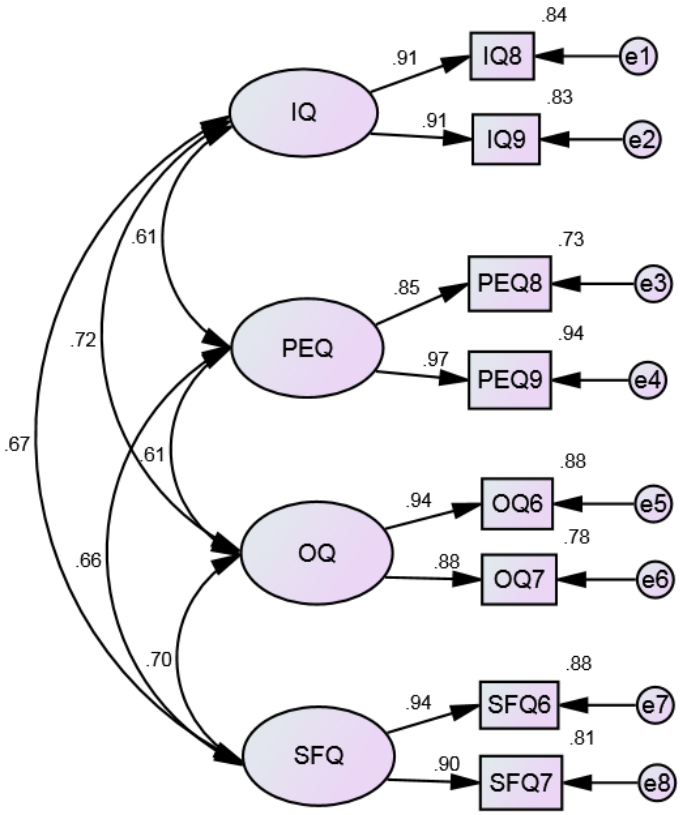


Figure 5-15 First-Order Confirmatory Factor Analysis Model for Service Quality

Table 5-50 Goodness-of-Fit Results of First-Order Confirmatory Factor Analysis Model for Service Quality

Goodness-of-Fit Indices	Values
Chi-square (χ^2)	27.622
Normed Chi-square (χ^2 / df)	1.973
Goodness-of-Fit Index (GFI)	0.974
Root Mean Residual (RMR)	0.027
Comparative Fit Index (CFI)	0.992
Normed Fit Index (NFI)	0.983
Root Mean Square Error of Approximation (RMSEA)	0.063

Moreover, as suggested in the literature (Byrne, 2010; Hair et al., 2010; Janssens et al., 2008; Kline, 2011; Schumacker & Lomax, 2004), verifying construct validity and reliability are required for a measurement model before modelling the structural model. In this study, the construct validity was verified by examining the unidimensionality, which is recommended by Byrne (2010) as a prerequisite indicator of construct validity and reliability. Then the construct validity was reconfirmed by examining convergent validity and discriminant validity, while reliability was verified by examining average variance extracted (AVE) and composite reliability. As far as all criteria were concerned, the measurement model for service quality shows adequate construct validity and reliability.

The CFI index was 0.992 which was above the recommended threshold of 0.90 (Byrne, 2010), indicating that the measure model for service quality demonstrates adequate undimensionality (see Table 5-50). All of the standardized factor loadings of all measurement items were statistically significant (t-values > 1.96), and ranged from 0.855 to 0.970, which were above the recommended threshold value of 0.60 (Bagozzi & Yi, 1988). Thus, the measurement model for service quality demonstrates adequate convergent validity (see Table 5-51).

In addition, the AVEs ranged from 0.831 to 0.844, which were above the recommended threshold 0.50 (Fornell & Larcker, 1981), hence the model also shows adequate convergent validity (see Table 5-52).

The correlation coefficients of the four primary-dimensions of this model ranged from 0.605 to 0.717, which were below the recommended threshold of 0.85 (Kline, 2011), therefore the model shows adequate discriminant validity (see Table 5-51 or Figure 5-15).

The composite reliability values ranged from 0.907 to 0.915, which were above the recommended threshold of 0.70 (Kline, 2011; Nunnally, 1978), therefore this model exhibits adequate reliability (see Table 5-52).

Table 5-51 Standardized Solutions and Correlations of First-Order Confirmatory Factor Analysis Model for Service Quality

Variable Label	Factor Loading	Correlation
IQ8	0.915***	IQ ↔ PEQ 0.607
IQ9	0.912 (18.746***)	IQ ↔ OQ 0.717
PEQ8	0.855***	IQ ↔ SFQ 0.671
PEQ9	0.970 (16.468***)	PEQ ↔ OQ 0.605
OQ6	0.938***	PEQ ↔ SFQ 0.659
OQ7	0.884 (18.537***)	OQ ↔ SFQ 0.697
SFQ6	0.939***	
SFQ7	0.898 (19.254***)	

IQ = Interaction Quality, PEQ = Physical Environment Quality, OQ = Outcome Quality, SFQ = Social Factors Quality

( ) t Value

*** Statistically significant at the 0.001 level (t>3.291)

**Statistically significant at the 0.01 level (t>2.576)

*Statistically significant at the 0.1 level (t>1.645)

Table 5-52 Average Variance Extracted and Construct Reliability Result of the First-Order Confirmatory Factor Analysis Model for Service Quality

Variable Label	Construct Reliability	Average Variance Extracted
Interaction	0.910	0.835
Physical Environment	0.910	0.836
Outcome	0.907	0.831
Social Factors	0.915	0.844

5.11.2.2 Second-Order Confirmatory Factor Analysis Model for Service Quality

The second-order confirmatory factor analysis model for Service Quality was designed to examine the hypothesis that Service Quality for the higher education sector is a multidimensional construct, comprising four primary dimensions (Interaction Quality, Physical Environment Quality, Outcome Quality, and Social Factors Quality). This model tested the relationship between the four dependent first-order variables (Interaction Quality, Physical Environment Quality, Outcome Quality, and Social Factors Quality), and one independent second-order variable, Service Quality (see Figure 5-16).

The model presented 8 observed variables. The number of observed variances and covariances (8[8+1]/2) was 36, and the number of estimated parameters in the model was 22 (4 regression weights, 6 covariances and 12 variances). Based on the t-rule (Bollen, 2014; Kelloway, 1998), the first-order confirmatory factor analysis model for Service Quality was over-identified (the number of

observed variances and covariances were greater than the number of estimated parameters), and tested with 14 degrees of freedom (*df)* (36 pieces of information -22 parameters).

In addition, Byrne (2001, p.123) suggests that with a second-order model, it is necessary to *"check the identification status of the higher order portion of the model".* The higher order structure of the second-order confirmatory factor analysis model for Service Quality with four first-order factors was over-identified [10 pieces of information (4[4+1]/2) were greater than 8 estimated parameters (4 factor loadings and 4 residuals)] with 2 degrees of freedom (*df)* (10 pieces of information -8 parameters).

The model fit results for the second-order confirmatory factor analysis model for Service Quality indicated a good model fit to the sample data. All model fit indices were sufficiently satisfied with their relative recommended thresholds (Byrne, 2010; Hair et al., 2010) (see Table 5-53). Therefore, model modification was not necessary, as the second-order confirmatory factor analysis model for Service Quality had model fit indices that were more than satisfactory. The goodness-of-fit indices of the second-order confirmatory factor analysis model for Service Quality are summarized in Table 5-53.

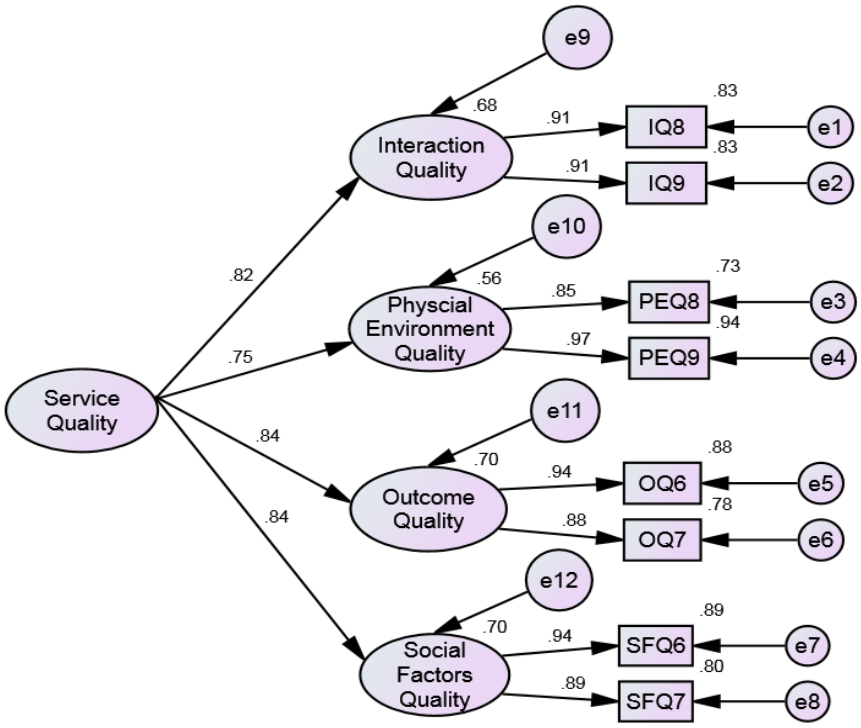


Figure 5-16 Second-Order Confirmatory Factor Analysis Model for Service Quality

Table 5-53 Goodness-of-Fit Results of Second-Order Confirmatory Factor Analysis Model for Service Quality

Goodness-of-Fit Indices	Values
Chi-square (χ^2)	31.235
Normed Chi-square (χ^2 / df)	1.952
Goodness-of-Fit Index (GFI)	0.971
Root Mean Residual (RMR)	0.038
Comparative Fit Index (CFI)	0.991
Normed Fit Index (NFI)	0.981
Root Mean Square Error of Approximation (RMSEA)	0.062

The results of the standardized solution and correlation of the second-order confirmatory factor analysis model for Service Quality were reasonable and statistically significant at the 0.001% level. These results supported the reliability and validity of the measures associated with the second-order confirmatory factor analysis model for Service Quality.

Specifically, the factor loading values associated with the four first-order factors indicated that Outcome Quality is the most reliable and strongest indicator for Service Quality (β = 0.839, t-value = 11.896, P < 0.001), followed by Social Factors Quality (β = 0.836, t-value = 11.523, P < 0.001), Interaction Quality (β = 0.824) and Physical Environment Quality (β = 0.749, t-value = 9.382, P < 0.001).

These results supported Hypotheses H1, H2, H3, H4 and H5 as stated in Chapter 3.

Moreover, the second-order latent variable, represented by Service Quality, explained 70.4% of variance for Outcome Quality, 69.9% of variance for Social Factors Quality, 67.9% of variance for Interaction Quality and 56.1% of variance for Physical Environment Quality (see Table 5-54).

Table 5-54 Standardized Solutions of Second-Order Confirmatory Factor Analysis Model for Service Quality

Variable Label	Factor Loading	R^2
Interaction Quality	0.824 ***	0.679
Physical Environment Quality	0.749 (9.382) ***	0.561
Outcome Quality	0.839 (11.896) ***	0.704
Social Factors Quality	0.836 (11.523) ***	0.699
IQ8	0.913 ***	
IQ9	0.913 (18.697) ***	
PEQ8	0.854 ***	
PEQ9	0.970 (16.398) ***	
OQ6	0.938 ***	
OQ7	0.884 (18.535) ***	
SFQ6	0.942 ***	
SFQ7	0.894 (19.312) ***	

IQ = Interaction Quality, PEQ = Physical Environment Quality, OQ = Outcome Quality, SFQ = Social Factors Quality
( ) t Value
*** Statistically significant at the 0.001 level (t>3.291)
**Statistically significant at the 0.01 level (t>2.576)
*Statistically significant at the 0.1 level (t>1.645)

5.11.3 Confirmatory Factor Analysis Model for the Higher Order Constructs

The CFA for the five higher order marketing constructs consist of the First-Order CFA to confirm the measurement model of the five higher order marketing constructs (Service Quality, Student Satisfaction, Student Involvement, University Image and Student Loyalty) and the causal path model to investigate the interrelationship between these five higher order constructs.

5.11.3.1 First-Order Confirmatory Factor Analysis Model for the Five Higher Order Constructs

The first-order confirmatory factor analysis model for the five higher order constructs was designed to test the relationships existing between the five higher order constructs (Service Quality, Student Satisfaction, Student Involvement, University Image and Student Loyalty) and their measurement items (see Figure 5-17).

The model presented 25 observed variables. The number of observed variances and covariances (25[25+1]/2) was 325, and the number of estimated parameters in the model was 60 (20 regression weights, 10 covariances and 30 variances). Based on the t-rule (Bollen, 2014; Kelloway, 1998), the preliminary first-order confirmatory factor analysis model for the five higher order constructs was over-identified (the number of observed variances and covariances were greater than the number of

estimated parameters), and tested with 265 degrees of freedom (*df)* (325 pieces of information -60 parameters).

Except for one item (SI1), the standardized factor loadings ranged from 0.667 to 0.930, all of which are well above the acceptable value of 0.60 (Bagozzi & Yi, 1988; Hair et al., 2010). The factor loading for item SI1 was 0.438. As the factor loading was below 0.60 it was deleted. All items were statistically significant at the .001% level, indicating unidimensionality among the items (Bagozzi & Yi, 1988; Hair et al., 2010; Janssens et al., 2008). After eliminating the item SI1, there were four items to measure Student Involvement.

However, one of the model fit indices, the Goodness-of-Fit Index (GFI), for the preliminary measurement model for the five higher order constructs that was below the recommended threshold (see Table 5-55). Therefore, some modifications were required in order to improve the model fit (Byrne, 2010; Chinna, 2009; Hair et al., 2010; Kline, 2005; Nokelainen, 2009; Schumacker & Lomax, 2004).

Table 5-55 Goodness-of-Fit Results of the Preliminary First-Order Confirmatory Factor Analysis Model for the Five Higher Order Constructs

Goodness-of-Fit Indices	Values
Chi-square (χ^2)	563.532
Normed Chi-square (χ^2 / df)	2.127
Goodness-of-Fit Index (GFI)	0.846
Root Mean Residual (RMR)	0.088
Comparative Fit Index (CFI)	0.951
Normed Fit Index (NFI)	0.912
Root Mean Square Error of Approximation (RMSEA)	0.067

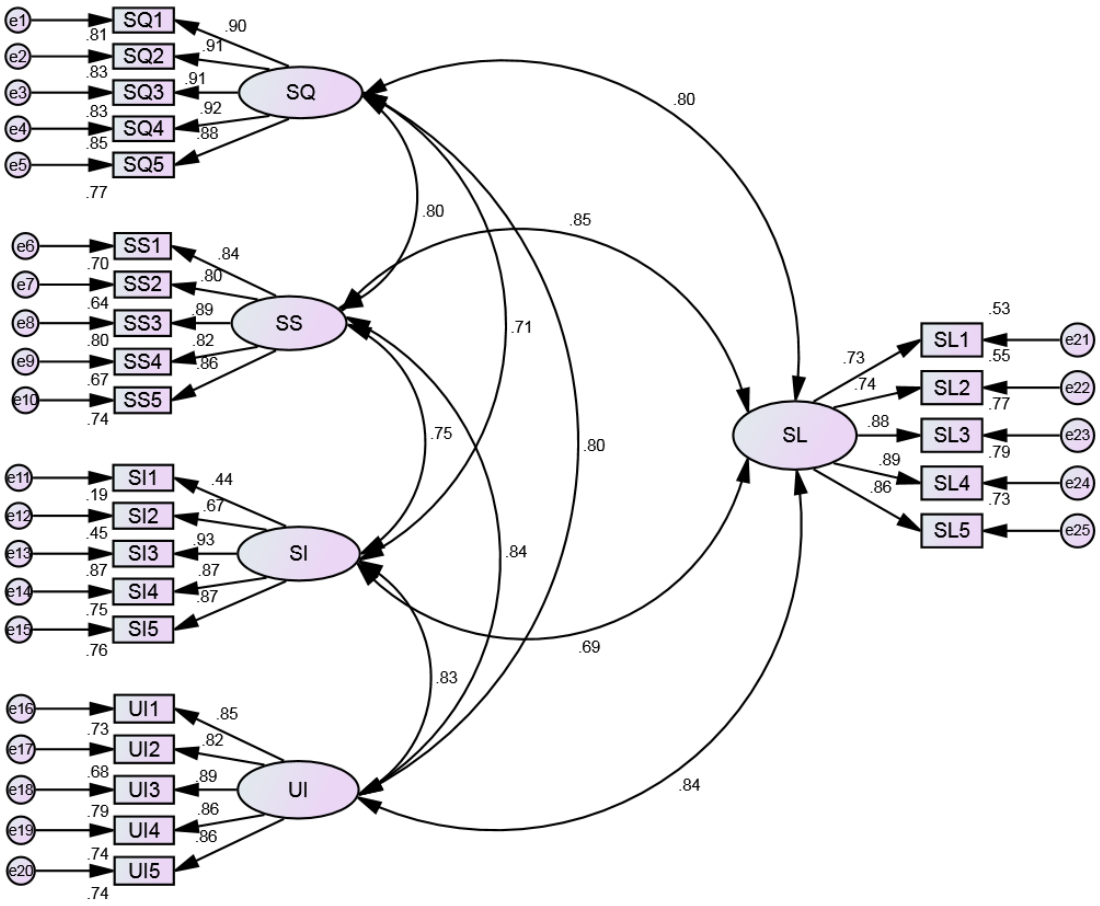


Figure 5-17 The Preliminary First-Order Confirmatory Factor Model for the Five Higher Order Constructs

The Modification Index (MI) revealed that the MI value between items SL1 and SL2 was higher than the recommended threshold of 15 which indicated that these two items were redundant items in the preliminary first-order confirmatory factor model for the five higher order constructs (Awang, 2012; Lawrence et al., 2013).

The MI value between items SS1 and SS was higher than the recommended threshold of 15 (Awang, 2012; Lawrence et al., 2013). The MI Index also showed that item SS1 was paired with SL4, SI, SQ, and UI respectively. The MI value between items SQ5 and SQ was higher than the recommended threshold of 15 (Awang, 2012; Lawrence et al., 2013). The MI Index also showed that item SQ5 was paired with SQ1, SL4, SS4, SQ4, and SQ3 respectively (see Table 5-56). Therefore, as far as the factor loadings and the MI values were concerned, the model was first re-specified by deleting items SL1, SS1 and SQ5 as they had high MI values (Awang, 2012; Bagozzi & Yi, 1988; Hair et al., 2010; Lawrence et al., 2013). After eliminating the items SL1, SS1 and SQ5, there were four items to measure Student Loyalty, four items to measure Student Satisfaction, and four items to measure Service Quality.

Table 5-56 Suggestions for Improving Model-Fit-Indices from MI

Items	Suggestions from Modification Index	Modification Index	Expected Par Change
Covariances			
e21 <-----> e22		37.832	0.357
(SL1) (SL2)			
e6 <-----> SS		26.724	-0.140
(SS1)			
e6 <-----> e24		11.886	-0.109
(SS1) (SL4)			
e6 <-----> SI		8.439	0.061
e6 <-----> SQ		7.563	0.087
e6 <-----> UI		4.055	0.049
e5 <-----> SQ		18.603	-0.114
(SQ5)			
e5 <-----> e1		10.036	-0.075
(SQ5) (SQ1)			
e5 <-----> e24		8.869	0.079
(SQ5) (SL4)			
e5 <-----> e9		7.251	0.086
(SQ5) (SS4)			
e5 <-----> e4		6.661	0.055
(SQ5) (SQ4)			
e5 <-----> e3		6.443	-0.060
(SQ5) (SQ3)			

The modified first-order measurement model for the five higher order constructs presented with 21 observed variables which were ν = 231 pieces of information (21[21+1]/2 = 231) and the number of estimated parameters were *p* = 52 parameters (16 Regression weights, 10 covariances and 26 variances). Based on the t-rule (Bollen, 2014; Kelloway, 1998), the modified first-order confirmatory model for the five higher order constructs was over-identified (the number of observed variances and covariances were greater than the number of estimated parameters) with 179 degrees of freedom (*df)* (231 pieces of information - 52 parameters).

After the re-specification process, all factor loadings (ranged from 0.664 to 0.933) for the measurement items in the model were above the recommended threshold value of 0.60 and statistically significant at the .001% level, indicating unidimensionality among the items (Bagozzi &Yi, 1988; Hair et al., 2010; Janssens et al., 2008) (see Table 5-58 and Figure 5-18).

Subsequently, the improvement in the model fit was examined by subtracting the overall χ^2 statistic for the modified model from the preliminary model. Comparing the preliminary model ($\chi^2_{[265]}$ = 563.532) with the modified model ($\chi^2_{[179]}$ = 287.213) yielded a difference in the χ^2 value of 276.319

($\Delta\chi^2_{[86]}$ = 276.319). Since $\Delta\chi^2_{[86]}$ = 276.319 > $\chi^2_{108.648,\alpha.05}$, the modified first-order model was statistically significant and indicated an improvement in the model-fit-indices (Hair et al., 2010).

After the re-specification process, all of the model fit indices were improved and sufficiently satisfied their relevant recommended thresholds, especially the GFI which had been unacceptable in the preliminary model. These values of these indices indicate a good model fit to the sample data in the modified model (Byrne, 2010; Hair et al., 2010) (see Table 5-57).

Table 5-57 Goodness-of-Fit Results of the Modified First-Order Confirmatory Factor Analysis Model for the Five Higher Order Constructs

Goodness-of-Fit Indices	Values
Chi-square (χ^2)	87.213
Normed Chi-square (χ^2 / *df*)	1.605
Goodness-of-Fit Index (GFI)	0.903
Root Mean Residual (RMR)	0.062
Comparative Fit Index (CFI)	0.979
Normed Fit Index (NFI)	0.946
Root Mean Square Error of Approximation (RMSEA)	0.049

Moreover, as suggested in the literature (Byrne, 2010; Hair et al., 2010; Janssens et al., 2008; Kline, 2011; Schumacker & Lomax, 2004), verifying construct validity and reliability are required for a measurement model before modelling the structural model. In this study, the construct validity was verified by examining the unidimensionality, which is recommended by Byrne (2010), as a prerequisite indicator of construct validity and reliability. Then the construct validity was reconfirmed by examining convergent validity and discriminant validity, while reliability was verified by examining average variance extracted (AVE) and composite reliability. As far as all criteria were concerned, the measurement model for the five higher order constructs shows adequate construct validity and reliability.

The CFI index was 0.979 which was above the recommended threshold of 0.90 (Byrne, 2010), indicating that the measure model for the five higher order constructs demonstrates adequate undimensionality (see Table 5-57).

All of the standardized factor loadings of all measurement items were statistically significant (t-values > 1.96), and ranged from 0.664 to 0.933, which were above the recommended threshold value of 0.60 (Bagozzi & Yi, 1988). Thus, the measurement model for the five higher order constructs demonstrates adequate convergent validity (see Table 5-58). In addition, the AVEs ranged from 0.705 to 0.835, which were above the recommended threshold 0.50 (Fornell & Larcker, 1981), hence the model also shows adequate convergent validity (see Table 5-59).

The correlation cofficients of the five higher order constructs of this model ranged from 0.664 to 0.831, which were below the recommended threshold of 0.85 (Kline, 2011), therefore, the model exhibits adequate discriminant validity (see Table 5-58 or Figure 5-18).

The composite reliability of the five higher order constructs ranged from 0.904 to 0.953, which were above the recommended threshold of 0.70 (Kline, 2011; Nunnally, 1978), therefore the model exhibits adequate reliability (see Table 5-59).

Table 5-58 Standardized Solution and Correlations of First-Order Confirmatory Factor Analysis Model for the Five Higher Order Constructs

Variable Label	Factor Loading	Correlation
SQ1	0.911***	SQ ⟷ SS 0.751
SQ2	0.910 (23.798***)	SQ ⟷ SI 0.689
SQ3	0.919 (24.315***)	SQ ⟷ UI 0.786
SQ4	0.913 (23.789***)	SQ ⟷ SL 0.771
SS2	0.803***	SS ⟷ SI 0.705
SS3	0.906 (17.085***)	SS ⟷ UI 0.811
SS4	0.822 (14.768***)	SS ⟷ SL 0.827
SS5	0.872 (16.059***)	SI ⟷ UI 0.831
SI2	0.664***	SI ⟷ SL 0.664
SI3	0.933 (12.618***)	UI ⟷ SL 0.826
SI4	0.863 (11.894***)	
SI5	0.874 (12.128***)	
UI1	0.851***	
UI2	0.823 (16.585***)	
UI3	0.887 (18.808***)	
UI4	0.863 (17.699***)	
UI5	0.861 (17.784***)	
SL2	0.718***	
SL3	0.887 (13.624***)	
SL4	0.898 (13.832***)	
SL5	0.857 (13.202***)	

SQ=Service Quality, SS=Student Satisfaction, SI=Student Involvement, UI=University image, SL=Student Loyalty

Table 5-59 Average Variance Extracted and Construct Reliability Results of the First-Order Confirmatory Factor Analysis Model for the Five Higher Order Constructs

Variable Label	Construct Reliability	Average Variance Extracted
Service Quality	0.953	0.835
Student Satisfaction	0.913	0.725
Student Involvement	0.904	0.705
University Image	0.933	0.735
Student Loyalty	0.907	0.711

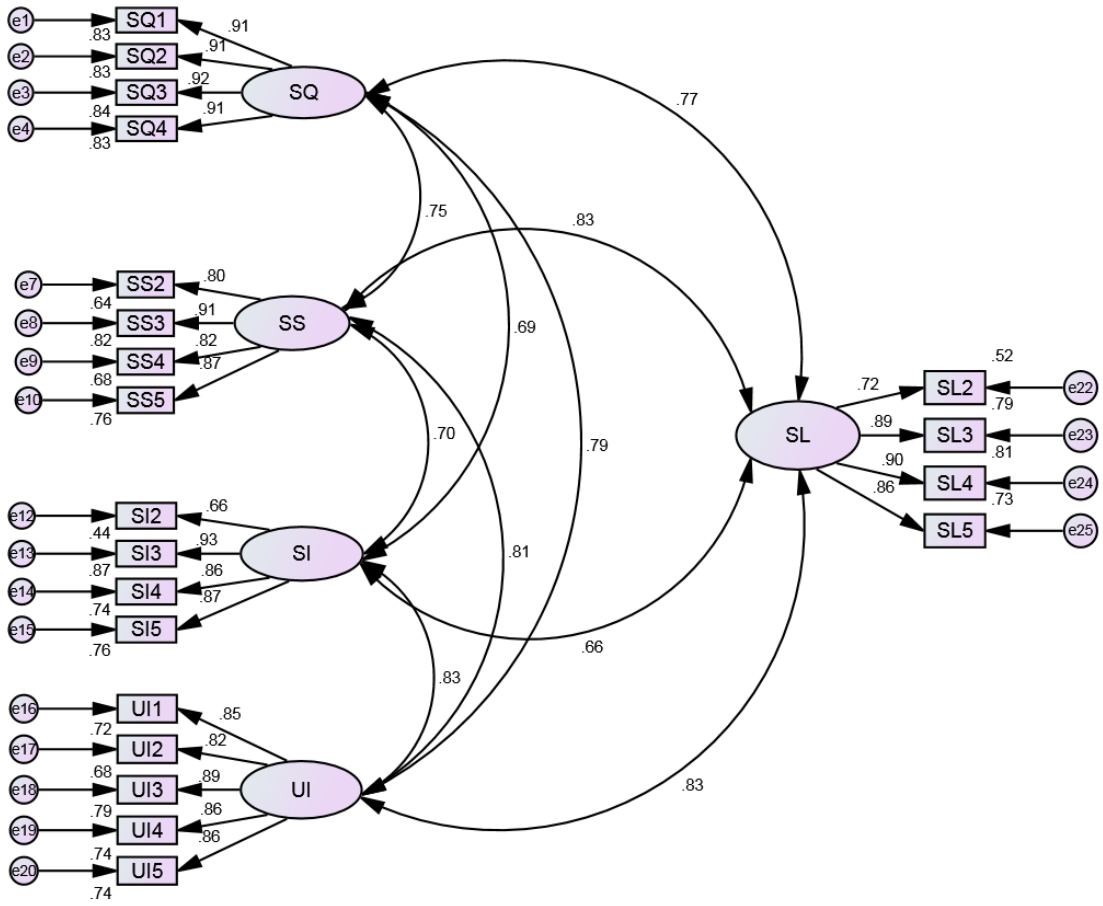


Figure 5-18 The Modified First-Order Confirmatory Factor Model for the Five Higher Order Constructs

5.11.3.2 The Structural Equation Modelling (SEM) Result

The structural equation modelling (SEM) was designed to determine the interrelationships between the five higher order constructs (Service Quality, Student Satisfaction, Student Involvement, University Image, and Student Loyalty). The SEM used in this study consisted of one exogenous variable (Service Quality) and four endogenous variables (Student Satisfaction, Student Involvement, University Image, and Student Loyalty) (see Figure 5-19).

The SEM for the five higher order constructs presented 21 observed variables. The number of observed variances and covariances (21[21+1]/2) was 231, and the number of estimated parameters in the model was 52 (26 regression weights and 26 variances). Based on the t-rule (Bollen, 2014; Kelloway, 1998), the SEM for the five higher order constructs was over-identified (the number of observed variances and covariances were greater than the number of estimated parameters), and tested with 179 degrees of freedom (*df)* (231 pieces of information -52 parameters).

The model-fit results for the SEM illustrated a good model fit to the sample data. All model-fit indices were sufficiently satisfied with their relative recommended thresholds (Byrne, 2010; Hair et al.,

2010). Thus, no model modification was required. The goodness-of-fit indices of the SEM for the five higher order constructs are presented in Table 5-60.

Table 5-60 Goodness-of-Fit Results of the Structural Equation Model

Goodness-of-Fit Indices	Values
Chi-square (χ^2)	287.213
Normed Chi-square (χ^2 / df)	1.605
Goodness-of-Fit Index (GFI)	0.903
Root Mean Residual (RMR)	0.062
Comparative Fit Index (CFI)	0.979
Normed Fit Index (NFI)	0.946
Root Mean Square Error of Approximation (RMSEA)	0.049

The standardized solutions for the SEM presented in Table 5-61 indicated that all estimates in the model were reasonable and statistically significant at the 0.001% level.

These results supported the reliability and validity of the measures associated with the structural equation model. Moreover, almost all causal effects were statistically significant except for the casual effect from Student Involvement to Student Satisfaction, Student Involvement to Student Loyalty, and Service Quality to Student Loyalty. The following paragraphs discuss the effect of the exogenous variable on each endogenous variable.

Firstly, the exogenous variables, Service Quality and Student Involvement explain 78% of the variance of the endogenous variable (University Image). Student Involvement was the most important determinant of University Image which had a significant total causal effect of 0.550, followed by Service Quality with a total causal effect of 0.407 (see Table 5-62).

The exogenous variables, University Image, Student Satisfaction, Service Quality and Student Involvement explain 77% of the variance of the endogenous variable (Student Loyalty). University Image was the most important determinant of Student Loyalty which had a significant total causal effect of 0.449 followed by Student Satisfaction with a total causal effect of 0.401, while the total causal effect of Service Quality and Student Involvement on Student Loyalty was not statistically significant (see Table 5-62).

The exogenous variables, University Image, Service Quality, and Student Involvement explain 69% of the variance of the endogenous variable (Student Satisfaction). University Image was the most important determinant of Student Satisfaction which had a significant total causal effect of 0.526, followed by Service Quality had a significant total causal effect of 0.292 on Student Satisfaction,

while the total causal effect of Student Involvement on Student Satisfaction was not statistically significant (see Table 5-62).

The exogenous variable, Service Quality explains 47% of the variance of the endogenous variable (Student Involvement) with a total causal effect of 0.689 (see Table 5-62).

Table 5-61 Standardized Solution of the Structural Equation Model

Variable Label	Factor Loading
SQ1	0.911***
SQ2	0.910 (23.789***)
SQ3	0.919 (24.315***)
SQ4	0.914 (23.696***)
SS2	0.803***
SS3	0.906 (17.085***)
SS4	0.822 (14.768***)
SS5	0.872 (16.059***)
SI2	0.664***
SI3	0.933 (12.618***)
SI4	0.863 (11.894***)
SI5	0.874 (12.128***)
UI1	0.851***
UI2	0.823 (16.585***)
UI3	0.887 (18.808***)
UI4	0.863 (17.699***)
UI5	0.861 (17.784***)
SL2	0.718***
SL3	0.887 (13.624***)
SL4	0.898 (13.832***)
SL5	0.857 (13.202***)

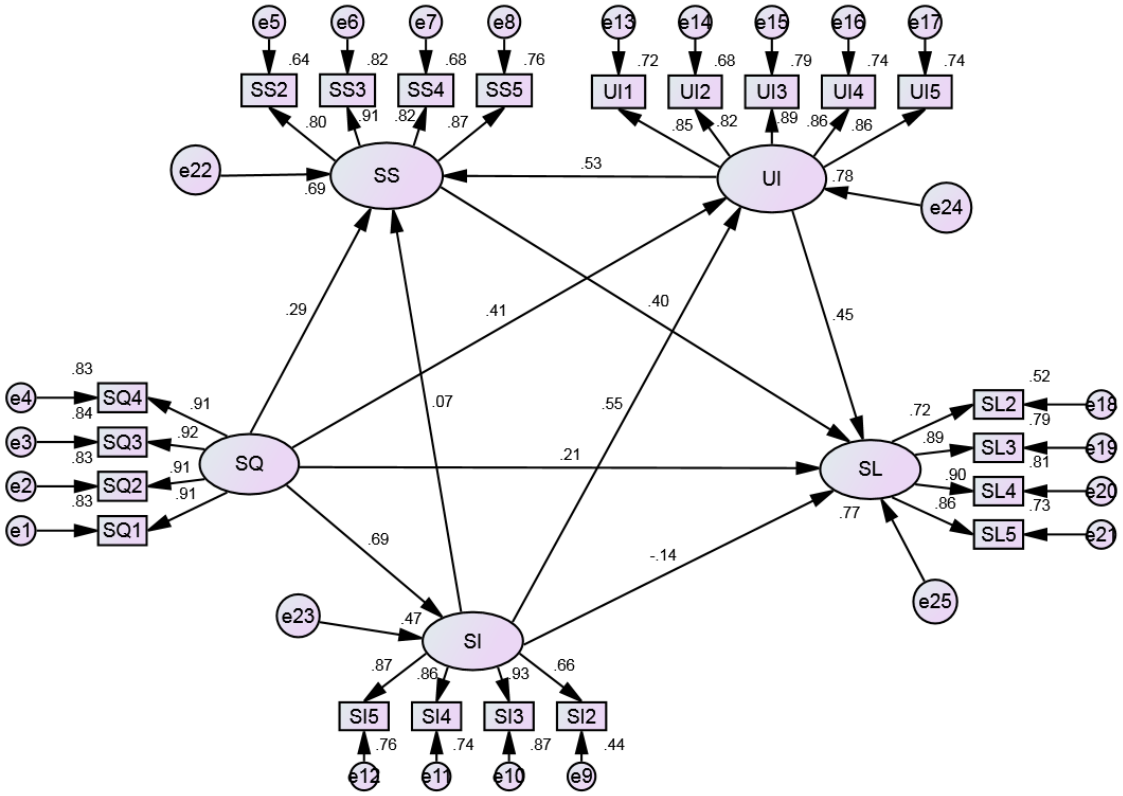


Figure 5-19 Structural Equations Model for the Five Higher Order Constructs (Service Quality, Student Satisfaction, Student Involvement, University Image, and Student Loyalty)

Table 5-62 Standardized Causal Effect of the Structural Equation Model and Hypotheses Assessment

Outcome	Determinant	Causal Effects		Hypotheses	Assessment
		Direct Causal Path	Critical Ratio		
University Image (R^2 = .777)	Student Involvement	.550	7.868***	H:14	Supported
	Service Quality	.407	7.103***	H:7	Supported
Student Loyalty (R^2 = .774)	University Image	.449	4.009***	H:12	Supported
	Student Satisfaction	.401	4.753***	H:18	Supported
	Service Quality	**.211**	**2.963(.003)**	**H:9**	**Not Supported**
	Student Involvement	**-.136**	**-1.703(.088)**	**H:15**	**Not Supported**
Student Satisfaction (R^2 = .693)	University Image	.526	4.795***	H:11	Supported
	Service Quality	.292	3.870***	H:6	Supported
	Student Involvement	**.067**	**.765(.444)**	**H:13**	**Not Supported**
Student Involvement (R^2 = .475)	Service Quality	.689	9.290***	H:8	Supported

5.11.4 Mediating Variable Analysis Results

Customer satisfaction has been identified as a mediator variable between service quality and customer loyalty (Caruana, 2002; Dado et al., 2012; Howat & Assaker, 2013; Ho, Kuo, & Lin, 2012; Olorunniwo, Hsu, & Udo, 2006; Yu & Ramanathan, 2012). Some studies also indicate that customer satisfaction fully mediates the effect of service quality on service loyalty (Caruana, 2002; Yu & Ramanathan, 2012). Therefore, the mediating variable analysis was designed in this study to test the effect of the mediating variable (Student Satisfaction) on the relationship between the exogenous variable (Service Quality) and the endogenous variable (Student Loyalty). To date, the Student Involvement construct has not been tested as a mediator on the relationship between the exogenous variable (Service Quality) and the endogenous variables (Student Satisfaction and University Image). However, the statistically analysis used to test for mediating effect of the Student Involvement construct is the same as recommended by the literature (Baron & Kenny, 1986; Frazier, Tix, & Barron, 2004; Hair et al., 2010; MacKinnon & Fairchild, 2009; Meyers et al., 2013; Shrout & Bolger, 2002). Thus, the mediating variable analysis was also used to test the effect of the mediating variable (Student Involvement) on the relationship between the exogenous variable (Service Quality) and the endogenous variable (Student Satisfaction and University Image) in this study.

A mediating variable analysis starts by testing the direct (and statistically significant) effect of the exogenous variable (e.g. Service Quality) on the endogenous variable (e.g. Student Loyalty). Partial mediation occurs when the mediating variable (e.g. Student Satisfaction) enters the model. If the direct effect of the exogenous variable on the endogenous variable is reduced but still significant partial mediation is present. If the effect is reduced and no longer significant, then complete mediation has occurred (Hair et al., 2010; Meyers et al., 2013; Shrout & Bolger, 2002). The following sections present the result of the mediating variable analysis.

5.11.4.1 The Mediating Effect of Student Satisfaction on the Relationship between Service Quality and Student Loyalty

Initially, testing the statistically significant direct effect between the exogenous and endogenous variable found that Service Quality had a significant direct effect on Student Loyalty as the regression weight value was 0.769 which was statistically significant at the 0.001% level (see Table 5-63 or Figure 5-20).

Table 5-63 Standardized Causal Effect of the Direct Effect of Service Quality on Student Loyalty

Outcome	Determinant	Causal Effects		Result
		Direct Causal Path	Critical Ratio	
Student Loyalty	Service Quality	.769	10.817***	Significant

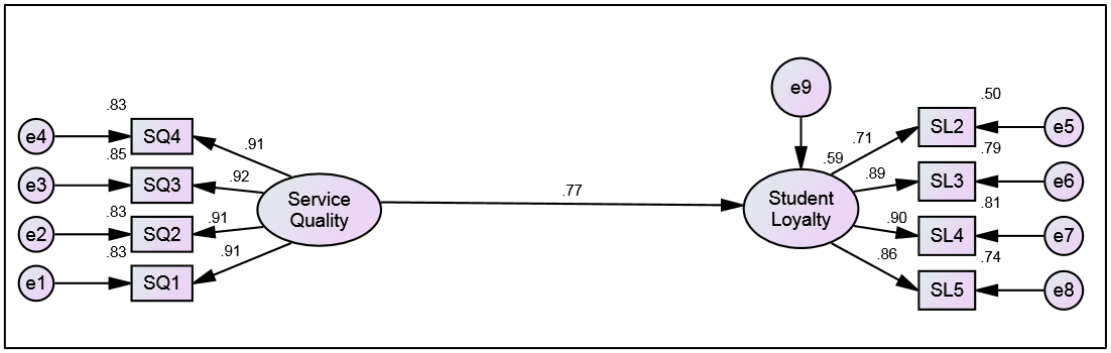


Figure 5-20 The Direct Effect of Service Quality on Student Loyalty

Table 5-64 Goodness-of-Fit Results of the Direct Effect of Service Quality on Student Loyalty Model

Goodness-of-Fit Indices	Values
Chi-square (χ^2)	38.288
Normed Chi-square (χ^2 / *df*)	2.015
Goodness-of-Fit Index (GFI)	0.964
Root Mean Residual (RMR)	0.053
Comparative Fit Index (CFI)	0.990
Normed Fit Index (NFI)	0.980
Root Mean Square Error of Approximation (RMSEA)	0.064

The model-fit results for the direct effect of Service Quality on Student Loyalty model in Table 5-64 indicated a good model-fit to the sample data. All model fit indices were sufficiently satisfied with their relative recommended thresholds (Byrne, 2010; Hair et al., 2010).

Then, the mediator variable Student Satisfaction was included in the model. The direct effect between Service Quality and Student Loyalty was still statistically significant after Student Satisfaction entered the model, even though the regression weight was reduced from 0.769 to 0.339. Therefore, Student Satisfaction is a partial mediator on the relationship between Service Quality and Student Loyalty (see Table 5-65 or Figure 5-21). In this case, Service Quality has a significant direct effect on Student Loyalty and also a significant indirect effect on Student Loyalty through the mediator variable Student Satisfaction.

Table 5-65 Standardized Mediating Effect of Student Satisfaction on the Relationship between Service Quality and Student Loyalty

Outcome	Determinant	Causal Effects		Result
		Direct Causal Path	Critical Ratio	
Student Satisfaction	Service Quality	.751	12.041***	Significant
Student Loyalty	Service Quality	.339	4.804***	Significant
Student Loyalty	Student Satisfaction	.572	7.108***	Significant

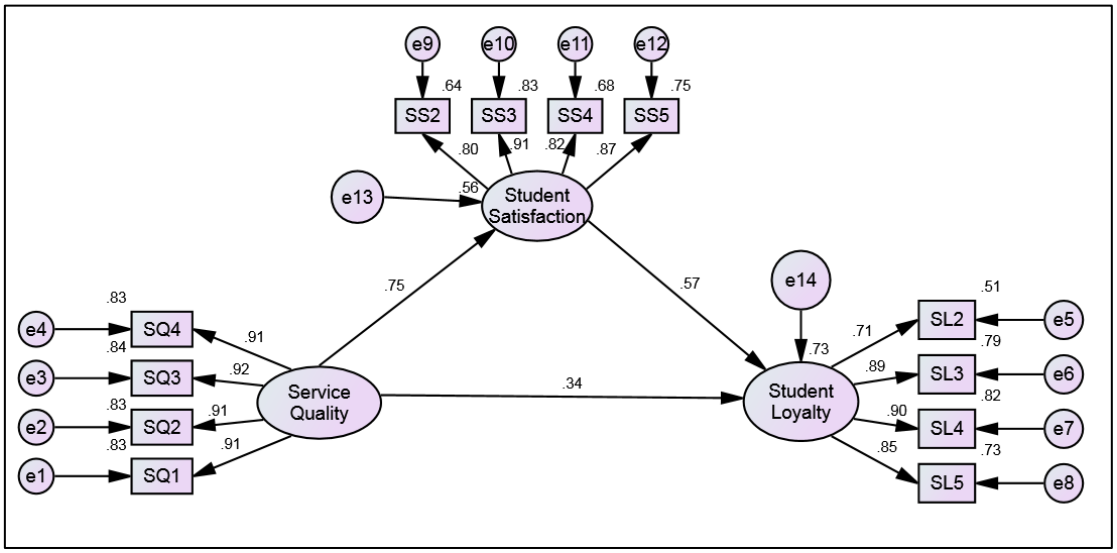


Figure 5-21 The Mediating Effect of Student Satisfaction on the Relationship between Service Quality and Student Loyalty

Table 5-66 Goodness-of-Fit Results of the Mediating Effect of Student Satisfaction on the Relationship between Service Quality and Student Loyalty Model

Goodness-of-Fit Indices	Values
Chi-square (χ^2)	80.671
Normed Chi-square (χ^2 / df)	1.582
Goodness-of-Fit Index (GFI)	0.949
Root Mean Residual (RMR)	0.048
Comparative Fit Index (CFI)	0.990
Normed Fit Index (NFI)	0.972
Root Mean Square Error of Approximation (RMSEA)	0.048

The model-fit results for the mediating effect of Student Satisfaction on the relationship between Service Quality and Student Loyalty model in Table 5-66 indicated a good model-fit to the sample data. All model fit indices were sufficiently satisfied with their relative recommended thresholds (Byrne, 2010; Hair et al., 2010).

5.11.4.2 The Mediating Effect of Student Involvement on the Relationship between Service Quality and University Image

Initially, testing the statistically significant direct effect between the exogenous and endogenous variable found that Service Quality had a significant direct effect on University Image as the regression weight value was 0.786, which was statistically significant at the 0.001% level (see Table 5-67 or Figure 5-22).

Table 5-67 Standardized Causal Effect of Direct Effect of Service Quality on University Image

Outcome	Determinant	Causal Effects		Result
		Direct Causal Path	Critical Ratio	
University Image	Service Quality	.786	13.604***	Significant

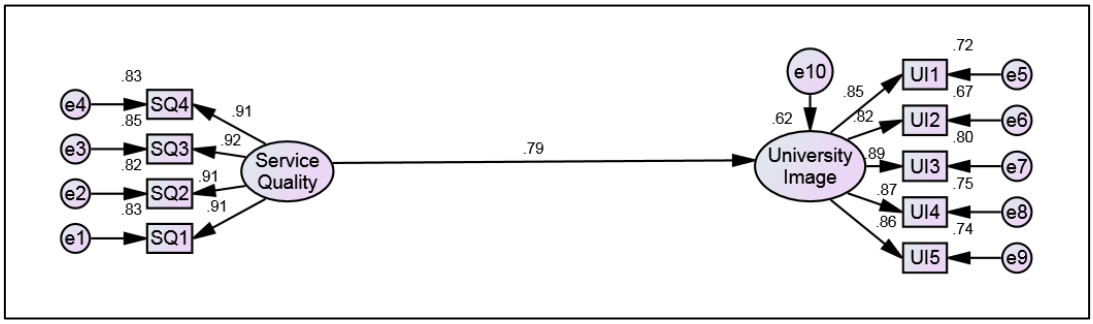


Figure 5-22 The Direct Effect of Service Quality on University Image

Table 5-68 Goodness-of-Fit Results of the Direct Effect of Service Quality on University Image Model

Goodness-of-Fit Indices	Values
Chi-square (χ^2)	55.443
Normed Chi-square (χ^2 / df)	2.132
Goodness-of-Fit Index (GFI)	0.955
Root Mean Residual (RMR)	0.029
Comparative Fit Index (CFI)	0.987
Normed Fit Index (NFI)	0.976
Root Mean Square Error of Approximation (RMSEA)	0.067

The model-fit results for the direct effect of Service Quality on University Image model in Table 5-68 indicated a good model-fit to the sample data. All model fit indices were sufficiently satisfied with their relative recommended thresholds (Byrne, 2010; Hair et al., 2010).

Then, the mediator variable Student Involvement was included in the model. The direct effect between Service Quality and University Image was still statistically significant after Student Involvement entered the model, even though the regression weight was reduced from 0.786 to 0.407. Therefore, Student Involvement is a partial mediator on the relationship between Service Quality and University Image (see Table 5-69 or Figure 5-23). In this case, Service Quality has a significant direct effect on University Image and also a significant indirect effect on University Image through the mediator variable Student Involvement.

Table 5-69 Standardized Mediating Effect of Student Involvement on the Relationship between Service Quality and University Image

Outcome	Determinant	Causal Effects		Result
		Direct Causal Path	Critical Ratio	
Student Involvement	Service Quality	.688	9.284***	Significant
University Image	Service Quality	.407	7.106***	Significant
University Image	Student Involvement	.550	7.861***	Significant

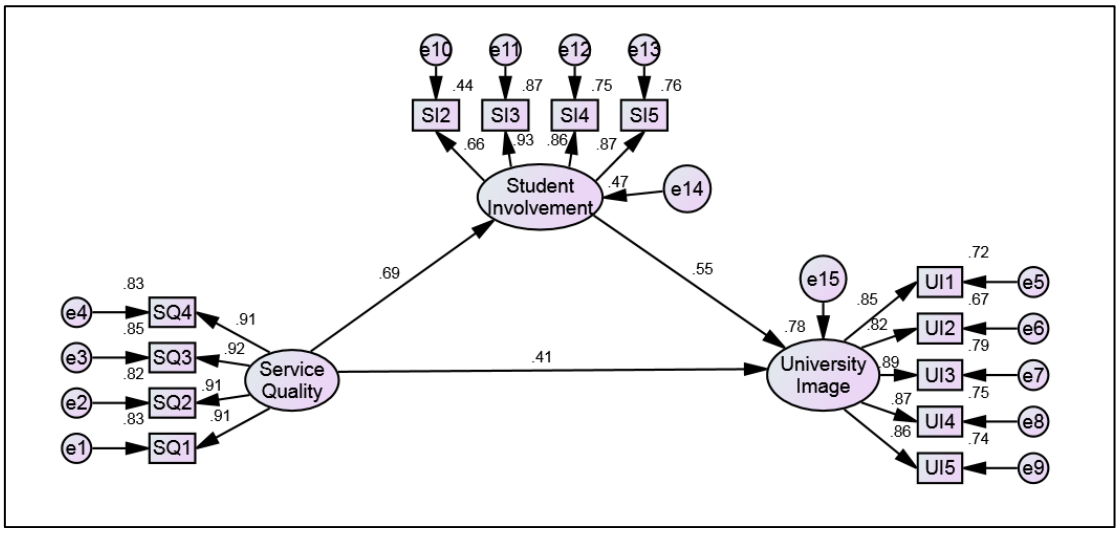


Figure 5-23 The Mediating Effect of Student Involvement on the Relationship between Service Quality and University Image

Table 5-70 Goodness-of-Fit Results of the Mediating Effect of Student Involvement on the Relationship between Service Quality and University Image Model

Goodness-of-Fit Indices	Values
Chi-square (χ^2)	109.760
Normed Chi-square (χ^2 / df)	1.770
Goodness-of-Fit Index (GFI)	0.937
Root Mean Residual (RMR)	0.053
Comparative Fit Index (CFI)	0.985
Normed Fit Index (NFI)	0.966
Root Mean Square Error of Approximation (RMSEA)	0.056

The model-fit results for the mediating effect of Student Involvement on the Relationship between Service Quality and University Image model in Table 5-70 indicated a good model-fit to the sample data. All model fit indices were sufficiently satisfied with their relative recommended thresholds (Byrne, 2010; Hair et al., 2010).

5.11.4.3 The Mediating Effect of Student Involvement on the Relationship between Service Quality and Student Satisfaction

Initially, testing the statistically significant direct effect between the exogenous and endogenous variable found that Service Quality had a significant direct effect on Student Satisfaction as the regression weight value was 0.75, which was statistically significant at the 0.001% level (see Table 5-71 or Figure 5-24).

Table 5-71 Standardized Causal Effect of Direct Effect of Service Quality on Student Satisfaction

Outcome	Determinant	Causal Effects		Result
		Direct Causal Path	Critical Ratio	
Student Satisfaction	Service Quality	.751	11.987***	Significant

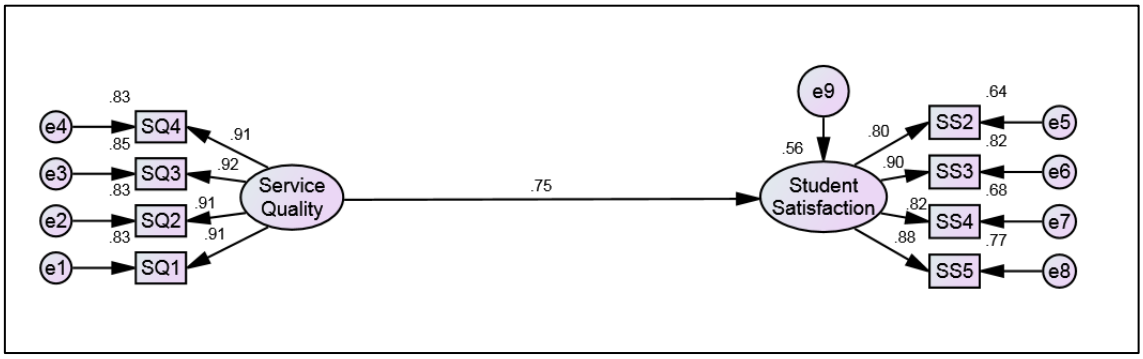


Figure 5-24 The Direct Effect of Service Quality on Student Satisfaction

Table 5-72 Goodness-of-Fit Results of the Direct Effect of Service Quality on Student Satisfaction Model

Goodness-of-Fit Indices	Values
Chi-square (χ^2)	31.486
Normed Chi-square (χ^2 / *df*)	1.657
Goodness-of-Fit Index (GFI)	0.970
Root Mean Residual (RMR)	0.032
Comparative Fit Index (CFI)	0.993
Normed Fit Index (NFI)	0.984
Root Mean Square Error of Approximation (RMSEA)	0.051

The model-fit results for the direct effect of Service Quality on Student Satisfaction model in Table 5-72 indicated a good model-fit to the sample data. All model fit indices were sufficiently satisfied with their relative recommended thresholds (Byrne, 2010; Hair et al., 2010).

Then, the mediator variable Student Involvement was included in the model. The direct effect between Service Quality and Student Satisfaction was still statistically significant after Student Involvement entered the model, even though the regression weight was reduced from 0.751 to 0.504. Therefore, Student Involvement is a partial mediator on the relationship between Service Quality and Student Satisfaction (see Table 5-73 or Figure 5-25). In this case, Service Quality has a significant direct effect on Student Satisfaction and also a significant indirect effect on Student Satisfaction through the mediator variable Student Involvement.

Table 5-73 Standardized Mediating Effect of Student Involvement on the Relationship between Service Quality and Student Satisfaction

Outcome	Determinant	Causal Effects		Result
		Direct Causal Path	Critical Ratio	
Student Involvement	Service Quality	.689	9.243***	Significant
Student Satisfaction	Service Quality	.504	7.135***	Significant
Student Satisfaction	Student Involvement	.358	4.912***	Significant

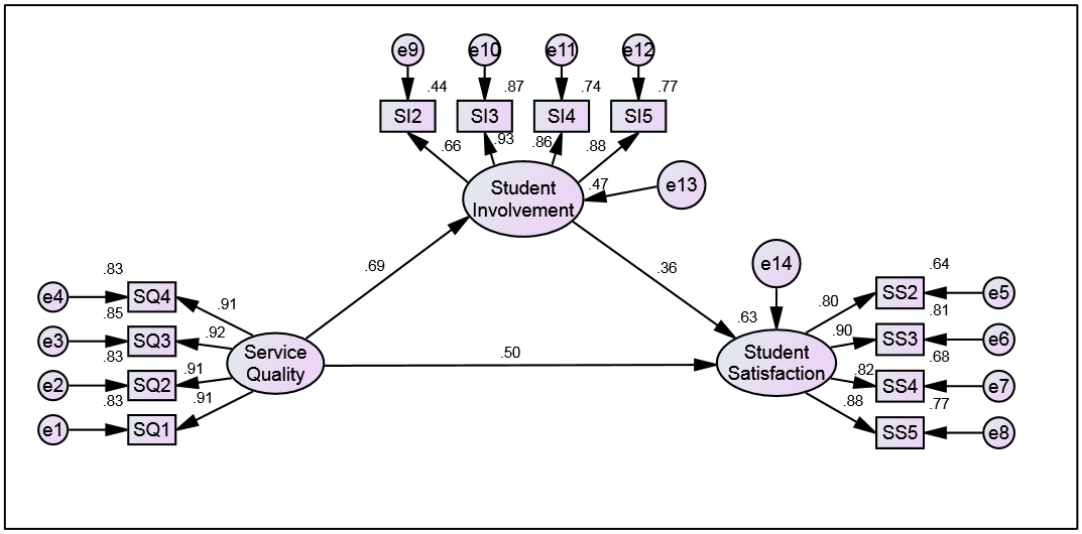


Figure 5-25 The Mediating Effect of Student Involvement on the Relationship between Service Quality and Student Satisfaction

Table 5-74 Goodness-of-Fit Results of the Mediating Effect of Student Involvement on the Relationship between Service Quality and Student Satisfaction Model

Goodness-of-Fit Indices	Values
Chi-square (χ^2)	78.595
Normed Chi-square (χ^2 / df)	1.541
Goodness-of-Fit Index (GFI)	0.950
Root Mean Residual (RMR)	0.056
Comparative Fit Index (CFI)	0.990
Normed Fit Index (NFI)	0.972
Root Mean Square Error of Approximation (RMSEA)	0.047

The model-fit results for the mediating effect of Student Involvement on the relationship between Service Quality and Student Satisfaction model in Table 5-74 indicated a good model-fit to the sample data. All model fit indices were sufficiently satisfied with their relative recommended thresholds (Byrne, 2010; Hair et al., 2010).

5.11.5 Multigroup analysis

In the previous sections on CFA and path analysis, the models were analysed with respect to a single group. This study also extends the analysis to determine if the model was equivalent for, or applicable to two groups. The groups used in the analysis were different genders (Males and Females) and different years-of-study (First and Third Year students).

Tests for measurement invariance were performed to assess if the models demonstrated invariance across the different gender groups and the different years-of-study groups. Tests for the structural invariance were performed to assess if the individual paths in a structural model were equivalent across different gender groups and the different years-of-study groups, or if the path coefficients varied between groups (Meyers et al., 2013). Both of the tests for the measurement invariance and structural invariance were conducted using IBM SPSS AMOS.

5.11.5.1 Testing for measurement invariance across groups

According to Meyers et al. (2013), testing for measurement invariance across groups should be assessed by a Chi-square difference test that compares two different models. The two models are:

The unconstrained model - where the groups yielded different values of the parameters (a Chi-square value was derived by computing model fit for the pooled sample of all groups).

The constrained model - where certain parameters were constrained to be equal between the groups (a Chi-square value was yielded for the constrained model).

A Chi-square difference test was used to determine if there was a significant difference between the fit measures for the two models. If the Chi-square difference test was not statistically significant between the unconstrained and the constrained models, then the model was invariant across groups and showed group equivalence. Therefore, the same model is applicable to both groups (Meyers et al., 2013).

5.11.5.1.1 Testing for measurement invariance across First Year students and Third Year students

This section details the test to determine if the SEM model is applicable across groups (for First Year students as well as Third Year students) and if the factor structure provides group equivalence.

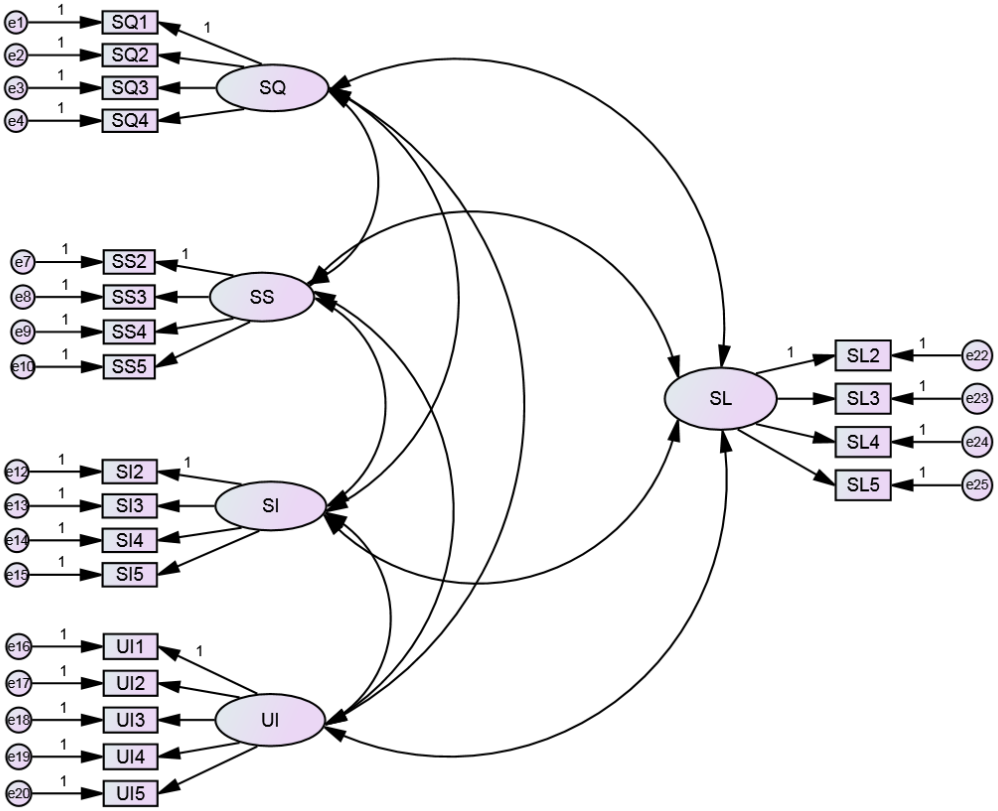


Figure 5-26 The Unconstrained Model for Different Years-of-study Groups

Table 5-75 Goodness-of-Fit Statistics for the Unconstrained Model for Different Years-of-study Groups

Goodness-of Fit Indices	Values
Chi-Square ($\mathcal{X}^2$)	669.430
Degree of Freedom (df)	358
Normed Chi-square ($\mathcal{X}^2$/df)	1.870
Comparative Fit Index (CFI)	0.955
Normed Fit Index (NFI)	0.909
Tucker-Lewis Index (TLI)	0.947
Root Mean Square Error of Approximation (RMSEA)	0.049

Table 5-75 reveals the $\mathcal{X}^2$ value is 669.43 with 358 degrees of freedom. The Normed Chi-square, CFI, NFI, TLI and RMSEA values are: 1.870, 0.955, 0.909, 0.947 and 0.049, respectively. All model fit indices sufficiently satisfy the relative recommended thresholds (Byrne, 2010; Hair et al., 2010). Therefore, the unconstrained model fit is adequate between First and Third Year students.

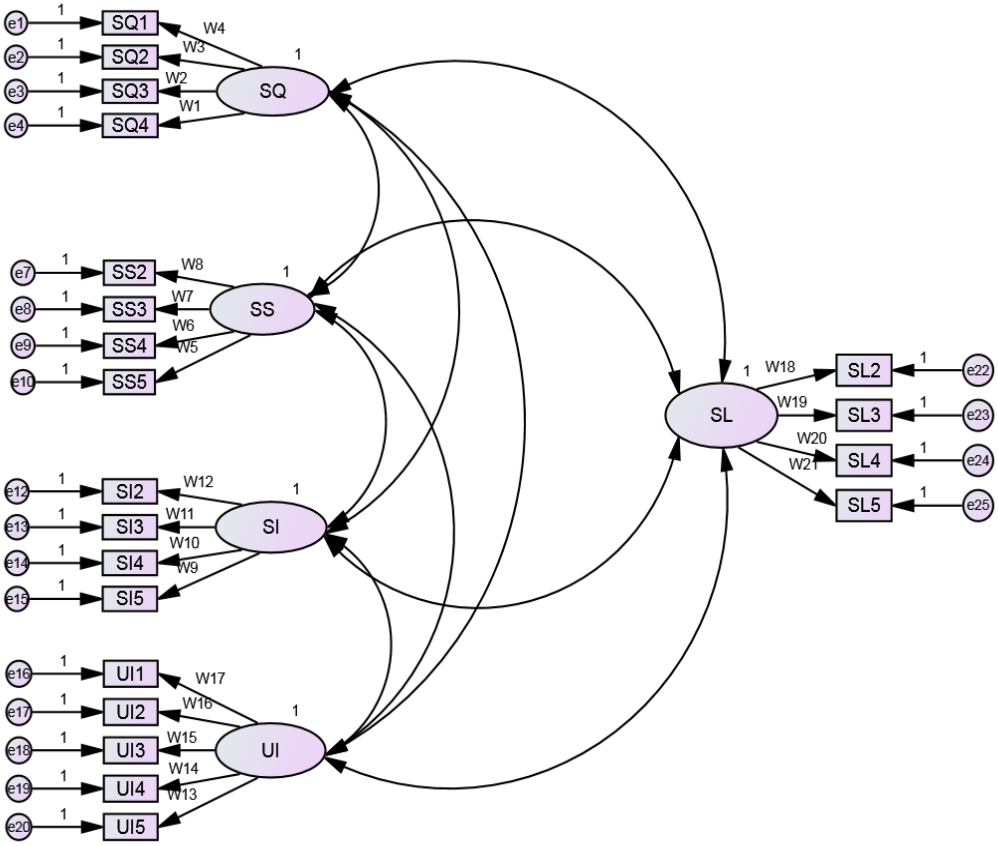


Figure 5-27 The Constrained Model for Different Years-of-study Groups

Table 5-76 Goodness-of-Fit Statistics for the Constrained Model for Different Years-of-study Groups

Goodness-of Fit Indices	Values
Chi-Square ($\mathcal{X}^2$)	700.314
Degree of Freedom (df)	379
Normed Chi-square ($\mathcal{X}^2$/df)	1.848
Comparative Fit Index (CFI)	0.954
Normed Fit Index (NFI)	0.905
Tucker-Lewis Index (TLI)	0.949
Root Mean Square Error of Approximation (RMSEA)	0.048

Table 5-76 reveals the $\mathcal{X}^2$ value is 700.314 with 379 degrees of freedom. The Normed Chi-square, CFI, NFI, TLI and RMSEA values are: 1.848, 0.954, 0.905, 0.949 and 0.048, respectively. All model fit indices sufficiently satisfy the relative recommended thresholds (Byrne, 2010; Hair et al., 2010). Therefore, the constrained model is adequate between First and Third Year students.

Table 5-77 The Chi-square Difference Test Results

	Chi-square	df	P_val
Overall Model			
Unconstrained	669.43	358	
Fully constrained	700.314	379	
Number of groups		2	
Difference	30.884	21	0.076

Since P = 0.076 > 0.05, there is no significant difference between the fit measures for the unconstrained model and the constrained model. Therefore, the model is invariant across the First and Third Year students.

5.11.5.1.2 Testing for measurement invariance across Males and Females

This section details the test to determine if the same SEM model is applicable across groups (for Males as well as Females) and if the factor structure provides group equivalence. The same unconstrained and constrained model (see Figure 5-26 and 5-27) were used to test for measurement invariance across different genders groups.

Table 5-78 Goodness-of-Fit Statistics for the Unconstrained Model for Different Genders Groups

Goodness-of Fit Indices	Values
Chi-Square ($\mathcal{X}^2$)	668.739
Degree of Freedom (df)	358
Normed Chi-square ($\mathcal{X}^2$/df)	1.868
Comparative Fit Index (CFI)	0.955
Normed Fit Index (NFI)	0.909
Tucker-Lewis Index (TLI)	0.947
Root Mean Square Error of Approximation (RMSEA)	0.049

Table 5-78 reveals the $\mathcal{X}^2$ value is 668.739 with 358 degrees of freedom. The Normed Chi-square, CFI, NFI, TLI and RMSEA values are: 1.868, 0.955, 0.909, 0.947 and 0.049, respectively. All model fit indices sufficiently satisfy the relative recommended thresholds (Byrne, 2010; Hair et al., 2010). Therefore, the unconstrained model is adequate between Males and Females.

Table 5-79 Goodness-of-Fit Statistics for the Constrained Model for Different Genders Groups

Goodness-of Fit Indices	Values
Chi-Square ($\mathcal{X}^2$)	687.515
Degree of Freedom (df)	379
Normed Chi-square ($\mathcal{X}^2$/df)	1.814
Comparative Fit Index (CFI)	0.955
Normed Fit Index (NFI)	0.906
Tucker-Lewis Index (TLI)	0.950
Root Mean Square Error of Approximation (RMSEA)	0.047

Table 5-79 reveals the $\mathcal{X}^2$ value is 687.515 with 379 degrees of freedom. The Normed Chi-square, CFI, NFI, TLI and RMSEA values are: 1.814, 0.955, 0.906, 0.950 and 0.047, respectively. All model fit indices sufficiently satisfy the relative recommended thresholds (Byrne, 2010; Hair et al., 2010). Therefore, the constrained model is adequate between Males and Females.

Table 5-80 The Chi-square Difference Test Results

	Chi-square	df	P_val
Overall Model			
Unconstrained	668.739	358	
Fully constrained	687.515	379	
Number of groups		2	
Difference	18.776	21	0.600

Since P = 0.600 > 0.05, there is no significant difference between the fit measures for the unconstrained model and the constrained model. The model is invariant across Males and Females.

5.11.5.2 Testing for structural invariance across groups (Path Analysis)

With measurement invariance established, structural invariance was then tested in order to determine if the causal relationships exist between the groups, or if the path coefficients vary between the groups (Meyers et al., 2013).

IBM SPSS AMOS compares the groups in five different ways in the default setup, including structural weights, structural intercepts, structural means, structural covariances, and structural residuals. This study focused on only one of the comparisons – structural weights, which refer to the path coefficients (Meyers et al., 2013). The analysis was performed to evaluate the difference between the unconstrained model and the constrained model. Model differences were evaluated with a Chi-square test. The two models being compared were:

The unconstrained model – where the groups yielded different values of the parameters;

The constrained model – where the groups yielded equivalent values of the parameters (Meyers et al., 2013). If the Chi-square test was not statistically significant, then there was no significant difference in fit between the unconstrained and the constrained models as measured across the groups.

5.11.5.2.1 Testing for structural invariance across First Year students and Third Year students

This section presents the results of test to determine if the causal relationships are present between the two groups (First and Third Year students), or if the path coefficients vary between the groups.

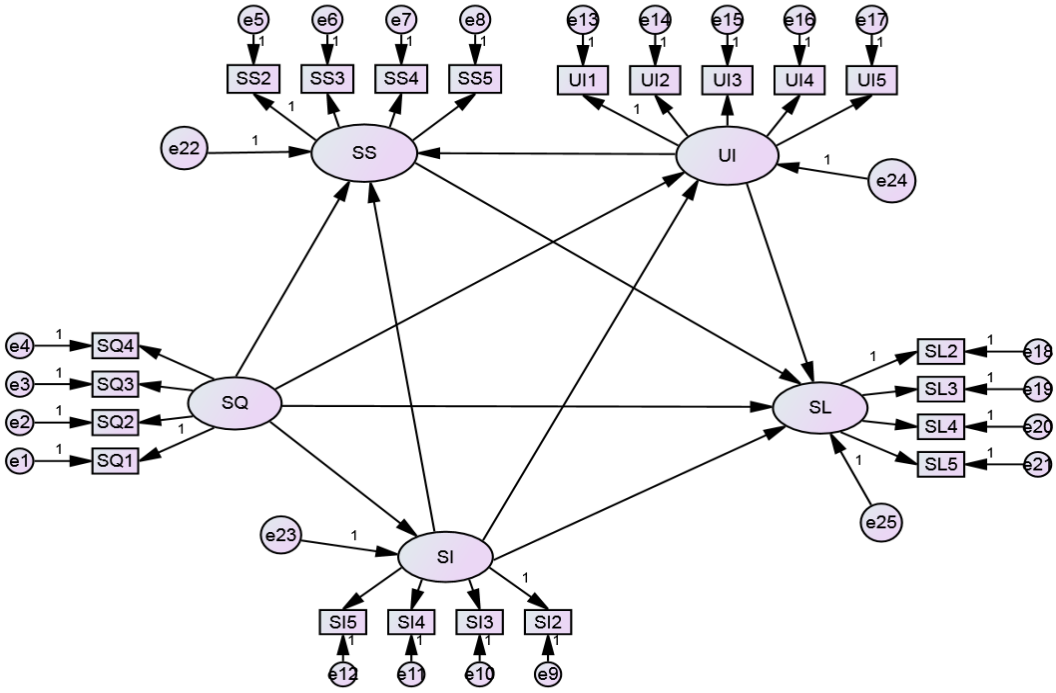


Figure 5-28 The Unconstrained Model for Different Years-of-study Groups

Table 5-81 Goodness-of-Fit Statistics for the Unconstrained Model for Different Years-of-study Groups

Goodness-of Fit Indices	Values
Chi-Square ($\mathcal{X}^2$)	669.430
Degree of Freedom (*df*)	358
Normed Chi-square ($\mathcal{X}^2/df$)	1.870
Comparative Fit Index (CFI)	0.955
Normed Fit Index (NFI)	0.909
Tucker-Lewis Index (TLI)	0.947
Root Mean Square Error of Approximation (RMSEA)	0.049

Table 5-81 reveals the $\mathcal{X}^2$ value is 669.430 with 358 degrees of freedom. The Normed Chi-square, CFI, NFI, TLI and RMSEA values are: 1.870, 0.955, 0.909, 0.947 and 0.049, respectively. All model fit

indices sufficiently satisfy the relative recommended thresholds (Byrne, 2010; Hair et al., 2010). Therefore, the unconstrained model is adequate between First and Third Year students.

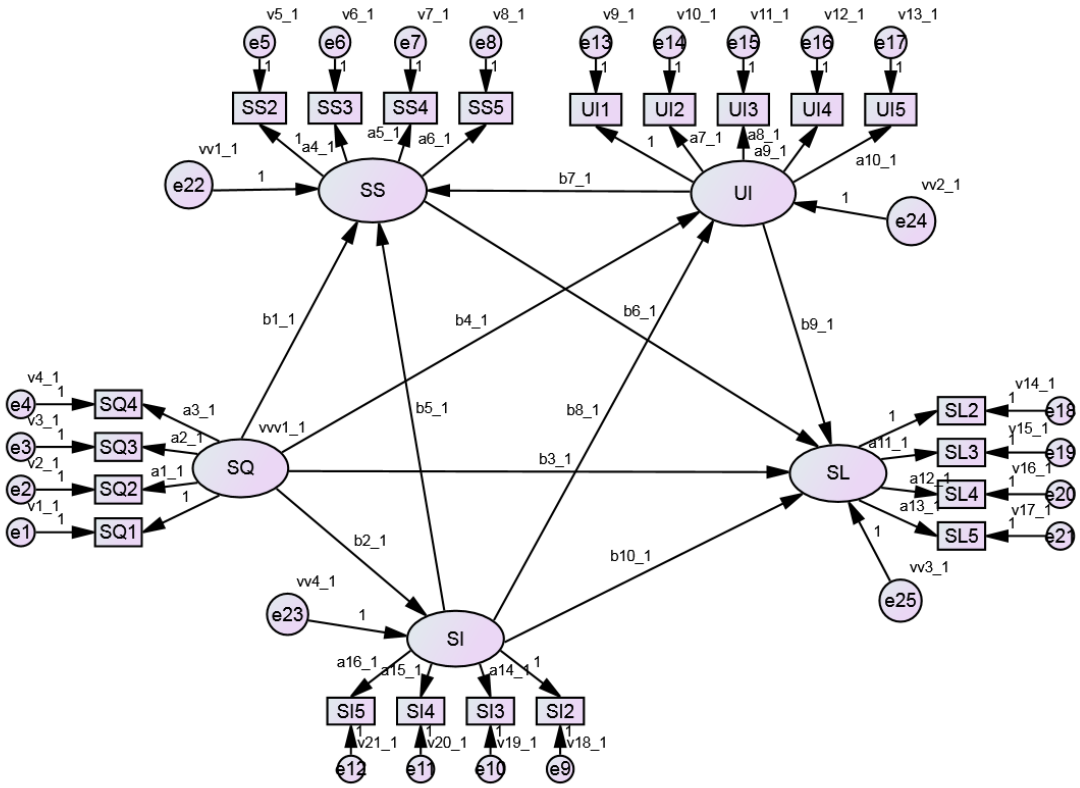


Figure 5-29 The Constrained Model for Different Years-of-study Groups

Table 5-82 Goodness-of-Fit Statistics for the Constrained Model for Different Years-of-study Groups

Goodness-of Fit Indices	Values
Chi-Square ($\mathcal{X}^2$)	677.965
Degree of Freedom (*df*)	368
Normed Chi-square ($\mathcal{X}^2/df$)	1.842
Comparative Fit Index (CFI)	0.955
Normed Fit Index (NFI)	0.908
Tucker-Lewis Index (TLI)	0.949
Root Mean Square Error of Approximation (RMSEA)	0.048

Table 5-82 reveals the $\mathcal{X}^2$ value is 677.965 with 368 degrees of freedom. The Normed Chi-square, CFI, NFI, TLI and RMSEA values are: 1.842, 0.955, 0.909, 0.949 and 0.048, respectively. All model fit indices sufficiently satisfy the relative recommended thresholds (Byrne, 2010; Hair et al., 2010). Therefore, the constrained model is adequate between First and Third Year students.

Model Comparison

For the comparison involving the path coefficients, labelled as Structural weights in Table 5-83, the Chi-square value is 8.535, with 10 degrees of freedom (there are ten paths in the model), the P value is 0.577. Since P = 0.577 > 0.05, there is no significant difference in fit between the unconstrained and the constrained models as measured across First and Third Year students.

Table 5-83 The comparison of the unconstrained and constrained models

Assuming model Unconstrained to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Structural weights	10	8.535	.577	.001	.001	-.002	-.002

Table 5-84 The comparisons of the ten paths in the model

			First Year		Third Year		
			Estimate	P	Estimate	P	z-stat
SI	<---	SQ	0.504	0.000	0.576	0.000	0.636
UI	<---	SQ	0.535	0.000	0.443	0.000	-0.982
UI	**<---**	**SI**	**0.219**	**0.010**	**0.409**	**0.000**	**1.737***
SS	<---	SQ	0.329	0.000	0.196	0.006	-1.148
SS	<---	SI	0.038	0.675	0.071	0.334	0.285
SS	<---	UI	0.611	0.000	0.598	0.000	-0.082
SL	<---	SQ	0.051	0.616	0.100	0.198	0.388
SL	<---	SS	0.278	0.016	0.386	0.000	0.686
SL	<---	UI	0.739	0.000	0.563	0.000	-0.860
SL	<---	SI	-0.029	0.762	-0.159	0.051	-1.029

Notes: *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.10

Table 5-84 shows that in terms of the individual paths, the only group difference is observed for the path from Student Involvement to University Image between First Year students and Third Year students (z = 1.737, p < 0.10). The path coefficients from Student Involvement to University Image are 0.409 and 0.219 for Third Year students and First Year students, respectively. The results illustrate that the Third Year students who perceive a high level of student involvement are more likely to have a good image of the university than the First Year students. No group difference is observed for the other nine paths in the model between First Year students and Third Year students.

5.11.5.2.2 Testing for structural invariance across Males and Females

This section presents the results of test to determine if the causal relationships are present between the two groups (Males and Females), or if the path coefficients vary between the groups. The same

unconstrained and constrained model as Figure 5-28 and 5-29 were used to test for structural invariance across different gender groups.

Table 5-85 Goodness-of-Fit Statistics for the Unconstrained Model for Different Genders Groups

Goodness-of Fit Indices	Values
Chi-Square ($\mathcal{X}^2$)	668.739
Degree of Freedom (*df*)	358
Normed Chi-square ($\mathcal{X}^2/df$)	1.868
Comparative Fit Index (CFI)	0.955
Normed Fit Index (NFI)	0.909
Tucker-Lewis Index (TLI)	0.947
Root Mean Square Error of Approximation (RMSEA)	0.049

Table 5-85 reveals the $\mathcal{X}^2$ value is 668.739 with 358 degrees of freedom. The Normed Chi-square, CFI, NFI, TLI and RMSEA values are: 1.868, 0.955, 0.909, 0.947 and 0.049, respectively. All model fit indices sufficiently satisfy the relative recommended thresholds (Byrne, 2010; Hair et al., 2010). Therefore, the unconstrained model is adequate between Males and Females.

Table 5-86 Goodness-of-Fit Statistics for the Constrained Model for Different Genders Groups

Goodness-of Fit Indices	Values
Chi-Square ($\mathcal{X}^2$)	676.939
Degree of Freedom (*df*)	368
Normed Chi-square ($\mathcal{X}^2/df$)	1.868
Comparative Fit Index (CFI)	0.955
Normed Fit Index (NFI)	0.909
Tucker-Lewis Index (TLI)	0.947
Root Mean Square Error of Approximation (RMSEA)	0.049

Table 5-86 reveals the $\mathcal{X}^2$ value is 676.939 with 368 degrees of freedom. The Normed Chi-square, CFI, NFI, TLI and RMSEA values are: 1.868, 0.955, 0.909, 0.947 and 0.049, respectively. All model fit indices sufficiently satisfy the relative recommended thresholds (Byrne, 2010; Hair et al., 2010). Therefore, the constrained model is adequate between Males and Females.

Model Comparison

For the comparison involving the path coefficients, labelled as Structural weights in Table 5-87, the Chi-square value is 8.200, with 10 degrees of freedom (there are ten paths in the model), the P value is 0.609. Since P = 0.609 > 0.05, there is no significant difference in fit between the unconstrained and the constrained models as measured across Males and Females.

Table 5-87 The comparison of the unconstrained and constrained models

Assuming model Unconstrained to be correct:

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Structural Invariance	10	8.200	.609	.001	.001	-.002	-.002

Table 5-88 The comparisons of the ten paths in the model

			Male		**Female**		
			Estimate	P	Estimate	P	z-stat
SI	<---	SQ	0.511	0.000	0.542	0.000	0.273
UI	<---	SQ	0.513	0.000	0.446	0.000	-0.706
UI	**<---**	**SI**	**0.218**	**0.002**	**0.453**	**0.000**	**2.023****
SS	<---	SQ	0.213	0.005	0.305	0.000	0.818
SS	<---	SI	0.062	0.345	0.058	0.558	-0.030
SS	<---	UI	0.598	0.000	0.610	0.000	0.075
SL	<---	SQ	0.182	0.070	0.054	0.493	-1.000
SL	<---	SS	0.313	0.045	0.333	0.000	0.110
SL	<---	UI	0.577	0.000	0.607	0.000	0.144
SL	<---	SI	-0.113	0.188	-0.060	0.512	0.423

Notes: *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.10

Table 5-88 shows that in terms of the individual paths, the only group difference is observed for the path from Student Involvement to University image between Males and Females ($z = 2.023$, $p < 0.05$). The path coefficients from Student Involvement to University Image are 0.453 and 0.218 for Females and Males, respectively. The results illustrate that Females who perceive a high level of student involvement are more likely to have a good image of the university than Males. No group difference is present for the other nine paths in the model between Males and Females.

Table 5-89 Summary of Hypotheses Testing

Hypotheses	Result
H1: There is a significant positive relationship between the Interaction Quality primary dimension and students' overall service quality perceptions.	**Supported,** Interaction Quality has a significant impact on overall service quality perceptions.
H2: There is a significant positive relationship between the Physical Environment Quality primary dimension and students' overall service quality perceptions.	**Supported,** Physical Environment Quality has a significant impact on overall service quality perceptions.
H3: There is a significant positive relationship between the Outcome Quality primary dimension and students' overall service quality perceptions.	**Supported,** Outcome Quality has a significant impact on overall service quality perceptions.
H4: There is a significant positive relationship between the Social Factors Quality primary dimension and students' overall service quality perceptions.	**Supported,** Social Factors Quality has a significant impact on overall service quality perceptions.
H5: Students will vary in their perceptions of the importance of each of the primary dimensions.	**Supported,** Outcome Quality is the most importance of the primary dimensions follows by Social Factors Quality, Interaction Quality, and Physical Environment Quality.
H6: Higher perceptions of Service Quality positively affect Student Satisfaction.	**Supported,** Service Quality has a significant and direct impact on Student Satisfaction.
H7: Higher perceptions of Service Quality positively affect University Image.	**Supported,** Service Quality has a significant and direct impact on University Image.
H8: Higher perceptions of Service Quality positively affect Student Involvement.	**Supported,** Service Quality has a significant and direct impact on Student Involvement.
H9: Higher perceptions of Service Quality positively affect Student Loyalty.	**Not Supported,** Service Quality does not have a significant and direct impact on Student Loyalty, but it has indirect effect through Student Satisfaction.
H10: Student Satisfaction mediates the relationship between Service Quality and Student Loyalty.	**Supported,** Student Satisfaction partial mediates the relationship between Service Quality and Student Loyalty.
H11: Higher University Image positively affects Student Satisfaction.	**Supported,** University Image has a significant and direct impact on Student Satisfaction.
H12: Higher University Image positively affects Student Loyalty.	**Supported,** University Image has a significant and direct impact on Student Loyalty.
H13: Higher Student Involvement positively affects Student Satisfaction.	**Not Supported,** Student Involvement does not have a significant and direct impact on Student Satisfaction.
H14: Higher Student Involvement positively affects University Image.	**Supported,** Student Involvement has a significant and direct impact on University Image.

H15: Higher Student Involvement positively affects Student Loyalty.	**Not Supported,** Student Involvement does not have a significant and direct impact on Student Loyalty.
H16: Student Involvement mediates the relationship between Service Quality and Student Satisfaction.	**Supported,** Student Involvement partial mediates the relationship between Service Quality and Student Satisfaction.
H17: Student Involvement mediates the relationship between Service Quality and University Image.	**Supported,** Student Involvement partial mediates the relationship between Service Quality and University Image.
H18: Higher Student Satisfaction positively affects Student Loyalty.	**Supported,** Student Satisfaction has a significant and direct impact on Student Loyalty.
H19: Student perceptions relating to interrelationships among Service Quality, Student Satisfaction, Student Involvement, University Image, and Student Loyalty will differ between the First Year and Third Year students.	**Partial Supported,** the only group difference is observed for the path from Student Involvement to University Image between First and Third Year students.
H20: Student perceptions relating to interrelationships among Service Quality, Student Satisfaction, Student Involvement, University Image, and Student Loyalty will differ between Males and Females.	**Partial Supported,** the only group difference is observed for the path from Student Involvement to University Image between Males and Females.

Chapter 6

Discussion and Conclusion

The content of this chapter discusses the results of the research and draws conclusions based on the empirical analysis presented in Chapter 5. The theoretical and managerial implications of the research findings, the limitations of this study, and the directions for future research are also discussed in this chapter.

A comprehensive hierarchical modelling framework is used to analyse the interrelationships between the primary dimensions of higher education service quality and overall higher education service quality and the interrelationships among the higher order constructs: Service Quality, Student Satisfaction, Student Involvement, University Image, and Student Loyalty. The possible impacts of the mediating variables are also tested. Moreover, a multi-group analysis is conducted in order to investigate perceptual differences of the interrelationships among the higher order constructs between different genders and different years-of-study. Further, China's HEIs are representative of a long-duration and high customer involvement service, normally students are involved in the service process for four years. Several of these interrelationships have not been modelled in previous research and these interrelationships may vary in services of different time durations and with different levels of customer involvement.

The results of the testing each hypothesis are presented in the following seven sections: The results pertaining to Research Objective 1 are discussed in Section 6.1. The results pertaining to Research Objective 2 are discussed in Section 6.2. The results pertaining to Research Objective 3 are discussed in Section 6.3. The results pertaining to Research Objective 4 are discussed in Section 6.4.

Further, the theoretical and managerial implications are discussed in Section 6.5 and 6.6. The limitations of this current study are discussed in Section 6.7. Finally, the directions for future research are discussed in Section 6.8.

6.1 The Conceptualisation of Service Quality for China's HEIs (Research Objective 1)

Service quality is conceptualised by several scholars as a hierarchical construct consisting of primary dimensions and sub-dimensions (Akter et al., 2013; Brady & Cronin, 2001; Clemes et al., 2014; Clemes et al., 2013; Clemes, Gan, et al., 2011; Clemes et al., 2008; Dagger et al., 2007; Hossain et al., 2014; Pollack, 2009; Wu & Cheng, 2013). However, the exact dimensional set representing service

quality needs to be confirmed for each industry setting, as the dimensions may differ in kind and in number. (Clemes, Gan, et al., 2011; Cronin & Taylor, 1994).

In an early study, Clemes et al. (2001) empirically identified two primary dimensions and seven pertaining sub-dimensions for university education in New Zealand, and in a further study ten sub-dimensions and three primary dimensions were identified in an extension of the original study (Clemes et al., 2008). Clemes et al. (2013) empirical identified thirteen sub-dimensions and three primary dimensions in a study on higher education in China. Teeroovengadum, Kamalanabhan, and Seebaluck (2016) identified nine sub-dimensions and five primary dimensions for higher education in Mauritius using EFA. However, the dimensional set was not subjected to multiple regression analysis or confirmed using CFA. The sets of sub-dimensions were relatively stable across Clemes et al.'s (2008) and Clemes et al.'s (2013) studies. As the main focus of this current research is on the Student Loyalty and its interrelationships with the other higher order constructs (including Student Involvement), a precise sets of sub-dimensions were not factored in this study.

Four primary dimensions of higher education service quality were investigated and confirmed in this current study. Three were based on the extant literature (Interaction Quality, Physical Environment Quality, and Outcome Quality) and one (Social Factors Quality) derived from the focus group discussions, discussions with academics, and discussed in the literature on higher education (Austin, 1984; Austin, 1999; Huang & Chang, 2004; Joseph, Yakhou, & Stone, 2005; Moore et al., 1998; Yin & Lei, 2007).

Interaction Quality focuses on how well the higher education service is delivered to the students by the lecturers. As teaching is suggested as a service encounter (Chung & McLarny, 2000), the service encounter in an educational context is defined as the dynamic interaction between students and lecturers (Schlesinger et al., 2015). The quality of the student-lecturer interface taking place during service delivery is critical to the HEI's performance, as the perceptions of higher education service quality are significantly influenced by the service delivery processes of HEIs.

Physical Environment Quality focuses on the quality of the physical features surrounding the service production process (Clemes et al., 2013; Elliott, Hall, & Stiles, 1993). Students assess higher education service quality based on their perceptions of the physical facilities and the personnel appearance. The physical environment of HEIs in which the service takes place has a significant impact on students' perceptions of overall higher education service quality.

Outcome Quality focuses on what customers gain from the service process and whether the customers' needs were fulfilled (Rust & Oliver, 1994). Students measure outcome quality based on whether the HEIs provide a good personal development and academic development for students.

Social Factors Quality focuses on students' social experiences in HEIs based on the extra-curricular activities, social activities and social practice activities offered by the HEIs. Participating in these out-of-class activities plays an important role in students' university experiences, as taking part in these activities helps encourage the social interactions of students and builds more positive relationships between students and the HEIs (Yin & Lei, 2007). The social factors of the HEIs has a significant impact on students' perceptions of overall higher education service quality.

The results of the statistical analysis show significant and positive relationships between the four primary dimensions and students' overall perceptions of higher education service quality (supporting Hypotheses 1 to 4). The results also confirm that the higher education service quality measurement model for China's HEIs consists of four first-order primary dimensions and one second-order overall higher education service quality construct.

The results in this current study show that university students evaluate higher education service quality offered by the HEIs represented in the sample through four primary dimensions (at a primary-dimensional level), and then their perceptions of all four primary dimensions are combined together to reflect students' overall higher education service quality perceptions.

The four primary dimensions (Interaction Quality, Physical Environment Quality, Outcome Quality, and Social Factors Quality) that were confirmed in this study to conceptualise higher education service quality. This result is consistent with previous studies that have confirmed at least three primary dimensions in kind for higher education in China (Clemes et al., 2013) and higher education in New Zealand (Clemes et al., 2008). However, the number of primary dimensions differ from those in the Clemes et al.'s (2008) and Clemes et al.'s (2013) research as social factors has been included as a fourth dimension in this current study.

In addition, the confirmation of the three primary dimensions in kind and number is consistent with numerous studies conducted on other industries and in different cultural settings that have also confirmed the three primary dimensions: mobile communications in China (Clemes, Shu, et al., 2014); the gaming industry in Macau (Wu & Hsu, 2012); professional sport in New Zealand (Clemes, Brush, et al., 2011); ski resorts in northern Greece (Kyle, Theodorakis, Karageorgiou, & Lafazani, 2010); agribusiness in the US (Gunderson, Gray, & Akridge, 2009); phone and hairdresser services in U.S. (Pollack, 2009); travel agencies in Spain (Martínez Caro & Martínez García, 2008); full-service restaurants in China (Chow et al., 2007); fast food, photograph developing, amusement parks and dry cleaning services in U.S. (Brady & Cronin, 2001).

Moreover, the number of primary dimensions confirmed in this study is consistent with Wu and Cheng's (2013) findings on the airline industry, Dagger et al.'s (2007) findings on health care, and Ko and Pastore's (2005) findings on the recreational sport industry.

Wu and Cheng (2013) confirmed four primary dimensions (Interaction Quality, Physical Environment Quality, Outcome Quality, and Access Quality) that customers perceived important in their assessment of airline industry service quality. Wu and Cheng (2013) suggest that customers may perceive the ease and speed with their reaching of desired locations (Access Quality) as one of the important attributes of airline industry service quality. Dagger et al. (2007) confirmed four primary dimensions (Interpersonal Quality, Technical Quality, Environment Quality, and Administrative Quality) that drive customers' perceptions of health care service quality. Dagger et al. (2007) suggest that customers may perceive the administration of complex and divergent health care services (Administrative Quality) as one of the important attributes of health care service quality. Ko and Pastore (2005) confirmed four primary dimensions (Program Quality, Interaction Quality, Outcome Quality, Physical Environment Quality) that customers perceived important in their evaluations of recreational sport service quality. Ko and Pastore (2005) suggest that customers may perceive the excellence of the program (Program Quality) as one of the important attributes of recreational sport service quality.

In a similar vein, students may perceive their social experiences that are based on extra-curricular activities, social activities and social practice activities offered by the HEIs (Social Factors Quality) as one of the important attributes of higher education service quality. Therefore, Social Factors Quality is identified as the fourth primary dimension of higher education service quality in this study.

6.2 The relative Importance of the Primary Dimensions of Service Quality for China's HEIs (Research Objective 2)

Identifying the most to least important service quality dimensions provides valuable information to managers of service organizations in various industries as they can use the information in their strategic planning process. Knowing the relative importance of the primary dimensions also aids management in allocating resources. Management can proportionally allocate resources to the most important dimension and may allocate fewer resources to the dimensions that are not as important to customers. Correctly allocating resources to the primary dimensions is particularly important as most organisations have resource constraints on their time and money (Clemes et al., 2014). Hence, Research Objective 2 is satisfied by testing Hypothesis 5 that identifies the relative importance of the primary dimensions of higher education service quality as perceived by university students in China.

The empirical results in this current study indicate that Outcome Quality is the most important indicator for measuring students' overall perceptions of higher education service quality, for a long duration and high customer involvement service typified by a HEI, followed by Social Factors Quality, Interaction Quality, and Physical Environment Quality (supporting Hypothesis 5).

Clemes et al.'s (2013) study on university education supports the finding in this current study that the Outcome Quality primary dimension is the most important indicator of higher education service quality when compared to Interaction Quality and Physical Environment Quality. Studies on services in other industries, such as the accommodation (Clemes, Gan, et al., 2011; Clemes et al., 2009), travel agencies (Martínez Caro & Martínez García, 2008), professional sports (Clemes, Brush, et al., 2011), electronic services (Fassnacht & Koese, 2006), urgent transport (Martínez Caro & Martínez García, 2007), agribusiness (Gunderson et al., 2009), airline industry (Wu & Cheng, 2013), also support the Outcome Quality primary dimension as the strongest indicator for measuring customers' overall perceptions of service quality when compared to other primary dimensions. Moreover, the findings of this current study is supported by the contention that the Outcome Quality primary dimension is an essential predictor of service quality (Brady & Cronin, 2001; Pollack, 2009; Powpaka, 1996).

Researchers suggest that the relative importance of the primary dimensions of service quality needs to be assessed in different cultural and industry settings due to the possible variation of the importance of the primary dimensions (Akter et al., 2013; Clemes, Brush, et al., 2011; Gunderson et al., 2009; Martínez Caro & Martínez García, 2007; Pollack, 2009). Indeed, several scholars using empirical methods report that the importance of primary dimensions of service quality do vary across different cultures and industry settings. Clemes et al.'s (2014) study on mobile communication and Clemes et al.'s (2008) study on university education in New Zealand show that Interaction Quality has a stronger influence on service quality than Physical Environment Quality and Outcome Quality. Hossian et al.'s (2015) research on retail banking services indicates that the Interaction Quality primary dimension has the greatest impact on the service quality when compared to Station Quality and Outcome Quality. Akter et al.'s (2013) study on mHealth services indicate that Interaction Quality is the most important indicator of mHealth service quality when compared to System Quality and Information Quality.

6.3 The Interrelationships between Service Quality, Student Satisfaction, Student Involvement, University Image and Student Loyalty (Research Objective 3)

The third objective of this research is to examine the interrelationships between the higher order constructs (Service Quality, Student Satisfaction, Student Involvement, University Image and Student

Loyalty) using a comprehensive hierarchical modelling framework. This current research empirically investigates the complex interrelationships between these five higher order marketing constructs in order to obtain a valuable insight into student loyalty for China's HEIs. Hypotheses 6 to 18 were formulated and tested using SEM to satisfy Research Objective 3. Hypotheses 6 to 9 were tested to determine the impact of Service Quality on Student Satisfaction, University Image, Student Involvement and Student Loyalty. Hypotheses 11 and 12 were tested to determine the impact of University Image on Student Satisfaction and Student Loyalty. Hypotheses 13 to 15 were tested to determine the impact of Student Involvement on Student Satisfaction, University Image and Student Loyalty. Hypothesis 18 was tested to determine the impact of Student Satisfaction on Student Loyalty. Hypothesis 10 was tested to determine the mediating impact of Student Satisfaction on the relationship between Service Quality and Student Loyalty. Hypotheses 16 and 17 were tested to determine the mediating impact of Student Involvement on the relationship between Service Quality, Student Satisfaction, and University Image. The following sections provide the results for each of the five higher order constructs.

6.3.1 Student Loyalty

The results pertaining to H9, H12, H15, and H18 indicate that 77% of the Student Loyalty construct variance is explained by Service Quality, Student Involvement, University Image, and Student Satisfaction. However, only the causal paths from University Image and Student Satisfaction show a significant and positive direct impact on Student Loyalty. Student Satisfaction and University Image are two significant determinants of Student Loyalty. University image has the most significant impact on Student Loyalty.

University Image is a significant and positive predictor of Student Loyalty. The standardized coefficient path between University Image and Student Loyalty ($\beta = 0.449$) indicates a significant and positive impact of University Image on Student Loyalty (supporting Hypothesis H12). The empirical finding supports the notion that students' favourable university image towards their institutions can result in student loyalty. This significant and positive impact of University Image on Student Loyalty is supported by the findings of earlier studies on higher education (Alves & Raposo, 2010; Alves & Raposo, 2007; Dehghan et al., 2014; Hashim, Abdullateef, & Sarkindaji, 2015; Helgesen & Nesset, 2007a; Kheiry, Rad, & Asgari, 2012; Schesinger et al., 2015), and on other service industries (Hart & Rosenberger, 2004; Hu et al., 2009; kandampully & Hu, 2007; Johnson, Gustafsson, Andreassen, Lervik, & Cha, 2001; Kandampully et al., 2011; Kandampully & Suhartanto, 2003; Kristensen, Martensen, & Grønholt, 1999; Lai et al., 2009; Ostrowski, O'Brien, & Gordon, 1993; Türkyilmaz & Özkan, 2007). The findings of the studies on the other industries also suggest a significant and positive impact of corporate image on customer loyalty.

However, Suhartanto et al.'s (2013) study on the hotel industry reveals an insignificant path between brand image and attitudinal loyalty, which demonstrates that brand image has no significant direct effect on attitudinal loyalty. The results of Suhartanto et al. (2013) show the indirect effect of brand image on attitudinal loyalty is substantial, hence, brand image plays an important role as a strengthening factor of loyalty building blocks rather than directly influencing brand loyalty in the study.

Student Satisfaction is also a significant and positive predictor of Student Loyalty. The result indicates the significant and positive impact of Student Satisfaction on Student Loyalty with the standardized coefficient path of $\beta = 0.401$ (supporting Hypothesis H18). The empirical finding of this current study supports the notion that satisfied students exhibit a loyal behaviours towards their institutions. The positive causal relationship between Student Satisfaction and Student Loyalty is supported in the studies on the higher education (Alves & Raposo, 2010; Alves & Raposo, 2007; Dehghan et al., 2014; Fernandes, Ross, & Meraj, 2012; Kheiry et al., 2012; Helgesen & Nesset, 2007a; Marzo-Navarro et al., 2005; Schertzer & Schertzer, 2004; Schesinger et al., 2015), and on other service industries (Cassel & Eklöf, 2001; Chen et al., 2011; Clemes et al., 2009; Dagger et al., 2007; Howat & Assaker, 2013; Hu et al., 2009; Kandampully & Hu, 2007; Kristensen et al., 1999; Lai et al., 2009; Osman & Sentosa, 2013). In addition, Clemes et al.'s (2013) study in China and Clemes et al.'s (2008) study in New Zealand on the higher education support the positive relationship between satisfaction and future attendance, and the positive relationship between satisfaction and recommend service (loyalty as behavioural). The finding of this current study demonstrates that students who are satisfied with their overall university experiences are more likely to be loyal to the university. When students are in the university, their satisfaction toward the university will affect their loyalty. This loyalty might be manifested in behaviours such as making positive WOM (recommend the institution to others), students' willingness to continue studying at the institution, sponsoring the institution, promoting the institution to the market, and preference in hiring graduates from the institution.

The standardized coefficient path between Service Quality and Student Loyalty is $\beta = 0.211$, indicating that Service Quality has an insignificant impact on Student Loyalty (no support for Hypothesis 9). The insignificant impact of Service Quality on Student Loyalty is supported in Perin et al.'s (2012) study in Brazilian higher educational context, and in the studies on other service industries (Hu et al., 2009; Osman & Sentosa, 2013). However, the insignificant path is inconsistent with the results of Annamdevula and Bellamkonda's (2016) study in Indian higher educational context that find out a significant path between students' perceived service quality and students' loyalty, and on other service industries (Aydin & Özer, 2005; Kuo et al., 2009).

Student Involvement has no significant direct impact on Student Loyalty. The standardized coefficient path between Student Involvement and Student Loyalty is β = - 0.136 (no support for Hypothesis H15). Therefore, regardless if a student is highly involved or not, the overall level of loyalty of this student will not be adversely affected. To date, the Student Involvement construct (as conceptualised in this current study) and its interrelationship with Student Loyalty has not been empirical examined in other published studies.

6.3.2 The Mediating Role of Student Satisfaction

The results of testing the mediating impact of Student Satisfaction on the relationship between Service Quality and Student Loyalty may explain the insignificant path between Service Quality and Student Loyalty in the model. The results demonstrate that Student Satisfaction has a partial mediating effect on the relationship between Service Quality and Student Loyalty (supporting Hypothesis 10), since the insertion of the Student Satisfaction construct between the Service Quality and Student Loyalty path results in a decrease in the path coefficient between Service Quality and Student Loyalty.

The finding of this current study suggests that Student Satisfaction has some influence on the relationship between Service Quality and Student Loyalty. Therefore, within a higher educational context, when a university student experiences a high level of perceived service quality and it is the only construct used to measure the impact on student loyalty, service quality effects student loyalty up to a certain level. Further, loyal students should offer positive word-of-month recommendations and re-enrol in the university for future study. However, when students also consider Student Satisfaction as the antecedent of Student Loyalty, then it reduces the direct effect of Service Quality on Student Loyalty. In this case, the finding enforces the importance of Service Quality as a direct driver of Student Loyalty. Moreover, Service Quality has a significant indirect effect on Student Loyalty through the mediator variable Student Satisfaction.

Bloemer and De Ruyter (1998) and Caruana (2002) support the partial mediation role of satisfaction between service quality and loyalty in the service marketing literature. The findings of these two studies have demonstrated that service quality directly affects loyalty and indirectly affects loyalty through satisfaction. Annamdevula and Bellamkonda (2016) support both the partial and complete mediation role of students' satisfaction between perceived service quality of students and their loyalty in Indian higher educational context.

The results of previous studies on other industries demonstrate that customer satisfaction has a full mediating effect on the relationship between service quality and customer loyalty, for example, banking (Caruana, 2002); hospitality (Ekinci, Dawes, & Massey, 2008); outdoor aquatic centres

(Howat & Assaker, 2013); travel agency (Kuo, Chang, Cheng, & Lai, 2013); and rural tourism (Osman & Sentosa, 2013). In these studies, customers who experienced a superior level of service quality during the service delivering process were highly satisfied. The high level of satisfaction resulted in a high level customer loyalty.

6.3.3 Student Satisfaction

The results pertaining to H6, H11, and H13 indicate that 69% of the Student Satisfaction construct variance is explained by University Image, Service Quality, and Student Involvement. However, only the causal paths from University Image and Service Quality show a significant and positive direct impact on Student Satisfaction. Therefore, University Image and Service Quality are two significant determinants of Student Satisfaction for the HEIs in China. However, the degree of importance between University Image, Service Quality, and Student Satisfaction varies. University Image has the most significant impact on Student Satisfaction, followed by Service Quality.

The standardized coefficient path between University Image and Student Satisfaction is $\beta = 0.526$, indicating that University Image has a significant and positive impact on Student Satisfaction (supporting Hypothesis 11). This result indicates that favourable University Image is a significant determinant of Student Satisfaction in a higher educational context. The significant and positive impact of University Image on Student Satisfaction is supported by several studies on higher education (Alves & Raposo, 2010; Alves & Raposo, 2007; Clemes et al., 2013; Clemes et al., 2008; Kheiry et al., 2012; Wang, Chen, & Chen, 2012), and in studies conducted on other service industries: hotels (Back, 2005; Clemes et al., 2009; Faullant, Matzler, & Füller, 2008), mobile communication (Clemes et al., 2014; Lai et al., 2009), department stores (Hart & Rosenberger, 2004), and restaurants (Ryu et al., 2008). The finding of this study suggests that a favourable University Image is an antecedent of Student Satisfaction in the HEIs in China. Overall, the finding shows that Student Satisfaction increases when University Image increases.

However, the finding of this current study is inconsistent with Helgesen & Nesset (2007) and Schlesinger et al.'s (2015) results. Helgesen & Nesset's study (2007) in Norway confirm a positive impact of student satisfaction on student perceptions of university image and reputation, and Schlesinger et al. (2015) show a positive impact of graduate satisfaction on student perceptions of university image in the Spain's higher education sector. These two studies believe that students have experiences related to the university college, and the university experiences accumulated during their studies (Satisfaction) influence the formation of students' perceived image of the university (Helgesen & Nesset, 2007; Schlesinger et al., 2015).

The majority of studies provide strong empirical support for the relationship (Image has a significant and positive impact on Satisfaction) identified in this current study.

The standardized coefficient path between Service Quality and Student Satisfaction is β = 0.292, indicating that Service Quality has a significant and positive impact on Student Satisfaction (supporting Hypothesis 6). The significant and positive impact of Service Quality on Student Satisfaction was expected as this relationship is empirically confirmed and supported in studies conducted on various service industries For example, Clemes et al.'s (2013) study on higher education; hotels (Clemes, Gan, et al., 2011; Clemes et al., 2009; Hu et al., 2009; Suhartanto et al., 2013); mHealth platforms (Akter et al., 2013), Kinmen National park (Chen et al., 2011), mobile communication (Clemes et al., 2014), health care (Dagger et al., 2007), public aquatic centres (Howat & Assaker, 2013), and ski resorts (Kyle et al., 2010). The finding of this current study confirms the dominant role of Service Quality as an important predictor of Student Satisfaction.

The Standardized coefficient path between Student Involvement and Student Satisfaction is β = 0.067, indicating that Student Involvement has an insignificant impact on Student Satisfaction (no support for Hypothesis 13). Therefore, regardless if a student is highly involved or not, the overall level of satisfaction of this student will not be adversely affected. To date, the Student Involvement construct (as conceptualised in this current study) and its interrelationship with Student Satisfaction has not been empirical examined in other published studies.

6.3.4 University Image

The results pertaining to Hypotheses 7 and 14 indicate a significant and positive direct impact of Service Quality and Student Involvement on University Image. The results of this study indicate that 78% of the University Image construct's variance was explained by Service Quality and Student Involvement. Therefore, Service Quality and Student Involvement are two significant determinants of University Image. However, the degree of importance between Service Quality, Student Involvement, and University Image varies. Student Involvement has a greater impact on University Image than Service Quality.

The standardized coefficient path between Student Involvement and University Image is β = 0.550, indicating that Student Involvement has a significant and positive impact on University Image (supporting Hypothesis 14). The significant and positive impact of customer engagement on corporate image is also supported by research on other service industries. Li, Berens, and de Maertelaere (2013) note the significant and positive impact of user engagement on corporate reputation when customers use a corporate twitter channel.

However, to date, the Student Involvement construct (as conceptualised in this current study) and its interrelationship with University Image has not been empirical examined in other published studies.

The results of this current study illustrate that Student Involvement is an antecedent of University Image. This result strengthens the argument that there are two components of university image: a functional component and an emotional component (Kennedy, 1977; Martinez, Perez, & del Bosque, 2014; Nguyen & Leclerc, 2011). The functional component builds a university image based on what students feel about the higher education's service quality. Therefore, if a student has a high level of involvement, it is likely that the student perceives a high level of the functional components of image, which leads to a more positive perception of the university's image. Moreover, student involvement also contributes to the emotional component of image. Since a student who is involved with the university, may have an emotional bonding with the university which creates a positive image of the university in the student's mind.

The standardized coefficient path between Service Quality and University Image is $\beta = 0.407$, indicating that Service Quality has a significant and positive impact on University Image (supporting Hypothesis 7). This significant and positive impact of Service Quality on University Image is supported by Clemes et al.'s (2013) study on higher education, and by the studies conducted on other service industries: hotels (Clemes et al., 2009; Hu et al., 2009; Kandampully et al., 2011; Kandampully & Hu, 2007), mobile communication (Aydin & Özer, 2005; Clemes et al., 2014; Lai et al., 2009), and airlines (Haspsari, Clemes, & Dean, 2014; Park, Robertson, & Wu, 2006).

Service Quality, has been assessed as a potential antecedent of University Image, and is differentiated into four primary dimensions (Interaction Quality, Physical Environment Quality, Outcome Quality, and Social Factors Quality) in this current study. All four primary dimensions are important factors that university students consider when judging perceived higher education service quality.

Importantly, the four primary dimensions contribute indirectly through service quality to the establishment of favourable student perceptions of University Image, since brand image can be considered as a consequence of customers' perception of service quality (Grönroos, 1984; Park, Robertson, & Wu, 2004). This results of this current study illustrate that Service Quality is an antecedent of University Image. When students enrol in a particular HEI, and form positive perceptions of the Interaction Quality, Physical Environment Quality, Outcome Quality, and Social Factors Quality of the HEIs during their four years of undergraduate study, then the level of the university's image will also be positively affected. In summary, when students perceive better higher education service quality, then they will perceive a more positive university image.

6.3.5 Student Involvement

The result pertaining to H8 demonstrates a significant and positive direct impact of Service Quality on Student Involvement. 47% of the Student Involvement construct variance is explained by Service Quality. The standardized coefficient path between Service Quality and Student Involvement is β = 0.689, indicating that Service Quality has a significant and positive impact on Student Involvement (supporting Hypothesis 8). This result implies that perceived Service Quality is the significant determinant of Student Involvement in the HEIs participating in the research. Students who believed they received superior service during service delivery are more likely to have a high involvement.

Service Quality, has been assessed as an antecedent of Student Involvement, and is differentiated into four primary dimensions (Interaction Quality, Physical Environment Quality, Outcome Quality, and Social Factors Quality). All four primary dimensions are important factors that university students consider when judging perceived higher education service quality. When students enrol in a particular HEI, and form positive perceptions of the Interaction Quality, Physical Environment Quality, Outcome Quality, and Social Factors Quality of the HEIs during their four years of undergraduate study, then the level of the students' involvement will also be positively affected. In summary, when students perceive better higher education service quality, then they will be more likely to get involved in the educational process.

To date, the Student Involvement construct (as conceptualised in this current study) and its interrelationship with Service Quality, Student Satisfaction, University Image, and Student Loyalty has not been empirical examined in other published studies.

6.3.6 The Mediating Role of Student Involvement

The mediating impact of Student Involvement on the relationship between Service Quality and Student Satisfaction is tested in this current study. The results demonstrate that Student Involvement has a partial mediating effect on the relationship between Service Quality and Student Satisfaction (supporting Hypothesis 16). The insertion of the Student Involvement construct between the direct path between Service Quality and Student Satisfaction reduces the magnitude of the significant path between Service Quality and Student Satisfaction.

Within a higher educational context, when a university student experiences a high level of perceived service quality and it is the sole construct used to measure its impact on student satisfaction, service quality has a positive direct effect on student satisfaction. However, the decrease in the path coefficient between Service Quality and Student Satisfaction indicates that Student Involvement has an influence on the direct relationship between Service Quality and Student Satisfaction when it is included in the model.

Moreover, the mediating impact of Student Involvement on the relationship between Service Quality and University Image is also tested in this current study. The results demonstrate that Student Involvement has a partial mediating effect on the relationship between Service Quality and University Image (supporting Hypothesis 17). The insertion of the Student Involvement construct between the direct path between Service Quality and University Image reduces the magnitude of the significant path between Service Quality and University Image.

When a university student experiences a high level of perceived service quality and it is the sole construct used to measure its impact on university image, service quality has a positive direct effect on university image. However, the decrease in the path coefficient between Service Quality and University Image indicates that Student Involvement has an influence on the direct relationship between Service Quality and University Image when it is included in the model.

The results of this current study suggest that when a student has a positive level of involvement with a particular HEI, the student is more likely to be satisfied with the HEI. Hence, when Student Involvement is selected as an antecedent of Student Satisfaction, then Student Involvement reduces the direct effect of Service Quality on Student Satisfaction. In this case, this finding reinforces the importance of Service Quality as a direct driver of Student Satisfaction. Moreover, Service Quality has a significant indirect effect on Student Satisfaction through the mediator variable Student Involvement.

Further, when a student has a certain level of involvement with a particular HEI, the student will be more likely to have a good image of the HEI. However, when Student Involvement is also considered as the antecedent of University Image, then it reduces the direct effect of Service Quality on University Image. In this case, the finding enforces the importance of Service Quality as a direct driver of University Image. Moreover, Service Quality has a significant indirect effect on University Image through the mediator variable Student Involvement.

To date, the Student Involvement construct (as conceptualised in this current study) and its mediating role on the relationship between Service Quality and University Image, between Service Quality and Student Satisfaction has not been empirical examined in other published studies.

6.3.7 Summary Findings of the Causal Model

The results of the causal model indicate that Student Satisfaction and University Image are two constructs that directly influence Student Loyalty, whereas, University Image has a stronger influence on Student Loyalty than Student Satisfaction. Among the antecedent factors of Student Satisfaction, University Image has a stronger influence on Student Satisfaction than Service Quality. Students who have a more favourable university image are more likely to be satisfied with the HEIs and in turn become loyal students. Importantly, this study also identifies the significant impact of Service Quality on Student Involvement, Student Satisfaction, and University Image. This finding implies that students who believe they receive superior service quality are more likely to get involved, will be more satisfied with the HEIs, and will form favourable images of the HEIs.

Although Service Quality has no direct impact on Student Loyalty in this study, Service Quality does impact on Student Loyalty via Student Satisfaction. Since Student Satisfaction has a partial medicating effect on the relationship between Service Quality and Student Loyalty. The analysis also indicates the direct impact of University Image on Student Loyalty and Student Satisfaction. Students who have a favourable impression of their universities are more satisfied and tend to be loyal to the HEIs.

In addition, the results of this current study indicate that Student Involvement has a significant impact on University Image. Therefore, the finding implies that students with higher level of involvement are more likely to form favourable images of the HEIs. The mediating analysis of Student Involvement demonstrates that Student Involvement has a partial mediating effect on the relationship between Service Quality and University Image, and on the relationship between Service Quality and Student Satisfaction. The findings confirm that Service Quality not only has a significant and direct impact on Student Satisfaction and University Image, but also a significant and indirect impact on Student Satisfaction and University Image through the mediator Student Involvement.

6.4 Multi-group Analysis (Research Objective 4)

The fourth objective of this study is to examine if any group difference exists in the interrelationships among the five higher order constructs in the model across the Gender Groups and the Years-of-study Groups. A multi-group analysis was conducted in order to determine if the causal relationships exist between the groups, or if the path coefficients vary between the groups (verifying any moderation effects of gender and years-of-study). Arbuckle (1997) noted that when compared to a separate analysis of distinct groups, multi-group analysis can estimate path coefficients more efficiently. In this study, the groups used in the analysis were different gender (students were

categorized into two groups - Males and Females) and different years-of-study (students were categorized into two groups - First and Third Year Students).

Empirically investigating the multi-group analysis provides a valuable insight into students' perceptions relating to the interrelationships among Service Quality, Student Satisfaction, Student Involvement, University Image, and Student Loyalty across different groups within the higher educational context. Hypotheses 19 and 20 were formulated and tested using multi-group analysis to satisfy Research Objective 4. Hypothesis 19 was tested to investigate whether students' perceptions of the interrelationships among the five higher order constructs differ across the First and Third Year Students. Hypothesis 20 was tested to investigate whether students' perceptions of the interrelationships among the five higher order constructs differ across Males and Females.

Gender is recognized as a moderating variable in the global services sector (Han & Ryu, 2007; Mattila, 2000; Mittal & Kamakura, 2001; Walsh, Evanschitzky, & Wunderlich, 2008). Gender differences have been discussed and studied in various studies, for example, in psychology and sociology literature (Ridgeway & Correll, 2004; Stewart & McDermott, 2004; Van der Graaff, Branje, De Wied, Hawk, Van Lier, & Meeus, 2014); in the travel literature (Kwun, 2011; Mattila, 2000; Meng & Uysal, 2008; Oh, Parks, & Demicco, 2002); in the area of entrepreneurship (Humbert & Drew, 2010; Thébaud, 2010); in the area of leadership (Burke & Collins, 2001); in marketing literature (Assael, Pope, Brenna, & Voges 2007; Han & Ryu, 2007; Mattila, 2000). The summation that gain be drawn from these various studies is that gender is an important demographic variable that is likely to moderate the interrelationships among the constructs. In addition, the focus groups used in this study recommend that the Years-of-study can be another important demographic variable that may moderate the interrelationships among the higher order constructs in the higher educational context. However, to date, the moderating effect of the Years-of-study has not been empirical examined in other published studies on higher education.

Moreover, published studies on the gender difference and Years-of-study difference in the higher education industry are sparse. This current study tests the differences across the Gender groups and the Years-of-study groups to obtain a more thorough understanding about students' perceptions relating interrelationships among the higher order constructs in the model.

The first step of the process of multi-group analysis is to test for measurement invariance across groups. This step details the test to determine if the SEM model is applicable across groups and if the factor structure provides group equivalence. Therefore, a Chi-square difference test was used to examine whether there was a significant difference between the fit measures for the unconstrained model (where the groups yielded different values of the parameters) and the constrained model (where certain parameters were constrained to be equal between the groups) (Meyers et al., 2013).

The results of testing for measurement invariance across First and Third Year Students in this study show that there is no significant difference between the fit measures for the unconstrained model and the constrained model (P = 0.076 > 0.05). The results of testing for measurement invariance across Males and Females in this study also show that there is no significant difference between the fit measures for the unconstrained model and the constrained model (P = 0.600 > 0. 05). Hence, the model is invariant across the Gender groups and the Years-of-study groups (Meyers et al., 2013).

Since the measurement invariance between the Gender groups and the Years-of-study groups were confirmed, the second step of multi-group analysis (testing for structural invariance) was conducted. This step details the test to determine if the causal relationships are present between the groups, or if the path coefficients vary between the groups. Therefore, a Chi-square test was used to evaluate the difference between the unconstrained model and the constrained model.

The results of testing for structural invariance across First and Third Year Students in this study show that there is no significant difference in fit between the unconstrained and the constrained models as measured across First and Third Year Students (P = 0.577 > 0.05). The results of testing for structural invariance across Males and Females in this study show that there is no significant difference in fit between the unconstrained and the constrained models as measured across Males and Females (P = 0.609 > 0.05). Therefore, the findings of this study show that the structural model does not vary across the Gender groups and the Years-of-study groups.

In addition, to test the moderation effect of Gender and Years-of-study, the ten individual paths in the model were compared to investigate difference across the Gender groups and the Years-of-study groups. For both the Gender groups and the Years-of-study groups, Service Quality has significant influence on Student Involvement, University Image, and Student Satisfaction. University Image has significant influence on Student Satisfaction and Student Loyalty. Student Satisfaction has significant influence on Student Loyalty. Though the path coefficients of these paths for the Males and Females, and for the First and Third Year Students are different, the differences are not statistically significant. Student Involvement has significant influence on University Image, and the only difference across the Gender groups and Years-of-study groups is observed for this path from Student Involvement to University Image.

The results show, the Third Year Students who perceive a high level of student involvement hold a more positive image of the university than the First Year Students and the difference is significant (z = 1.737, p-value < 0.10) (partial supporting Hypothesis 19). For the Third Year Students, they start to take their specialized courses which are much more complex than the basic courses they have in their first year in the university. Therefore, Third Year Students are more likely to have a high level of student involvement since they spend more time studying, completing their assignments,

participating in the lectures, and using different university facilities regularly. With their increasing level of student involvement, Third Year Students are more likely to form a positive image of the university.

Female students who perceive a high level of student involvement hold a more positive image of the university than Male students and the difference is significant ($z = 2.023$, p-value < 0.05) (partial supporting Hypothesis 20). Females are more attuned to the emotional level of feelings in decision-making than males (Kwun, 2011), hence, when female students are highly involved, they are more likely to be emotional bonded with the university. This high level of involvement is a plausible reason for an increase in university image from a female perspective.

The previous sections have discussed how university students conceptualise Service Quality, the interrelationships between the five higher order marketing constructs, and if students' perceptions relating interrelationships among the five higher order marketing constructs differ across the Gender groups and the Years-of-study groups. The theoretical and practical implications derived from the results of the empirical analysis are discussed in the following sections.

6.5 Theoretical Contributions

A Comprehensive hierarchical model for China's HEIs was tested in this current study to assess its suitability for a long duration and high customer involvement service such as higher education. Comprehensive hierarchical modelling enables researchers to not only to identify and confirm a set of primary dimensions underlying students' perceptions of higher education service quality, but also to assess the interrelationships among the five higher order marketing constructs featured in this study within a single model. This research makes four major theoretical contributions to the extant literature on services marketing, in particular, the literature on China's higher education industry.

First, a more comprehensive and complex model of student loyalty and its antecedents is developed and tested using SEM for China's Higher Education Sector, based on the perceptions of students in a non-western country. The empirical results presented in this study support the use of comprehensive hierarchical modelling to explain the interrelationships among the five important service marketing constructs (Service Quality, Student Satisfaction, Student Involvement, University Image, and Student Loyalty) in a single framework. Empirically examining the direct relationships, and the indirect relationships among these important marketing constructs is essential for the enrichment of the body of knowledge that is available for the higher education industry. Previous studies on the higher education sector have empirically examined the relationships among some of the higher order constructs using a series of multiple regression equations in multi-level models (Clemes et al., 2013;

Clemes et al., 2008). However, SEM provides a more robust analysis and reliability and validity can both be tested in the modelling framework (Hair et al., 2010).

The second contribution is to date, no published research has empirically tested the mediating role of Student Satisfaction on the relationship between Service Quality and Student Loyalty, the mediating role of Student Involvement on the relationship between Service Quality and Student Satisfaction, and the mediating role of Student Involvement on the relationship between Service Quality and University Image in the global higher education sector. The results of this current study illustrate that, in addition to the direct relationships, Service Quality also has an indirect effect on Student Loyalty through the mediating variable – Student Satisfaction, and an indirect effect on Student Satisfaction and University Image through the mediating variable – Student Involvement. This study demonstrates that Student Satisfaction has a partial mediating effect on the relationship between Service Quality and Student Loyalty. Moreover, Student Involvement has a partial mediating effect on the relationship between Service Quality and Student Satisfaction, and on the relationship between Service Quality and University Image. The mediating effects analysed in this study have not been fully explored in previous studies. Hence, the findings of this current study provide new insights into the interrelationships among these constructs in an educational setting.

The third contribution is that the empirical results of this current study confirm that in China's HEIs, perceived higher education service quality consists of four primary dimensions, as social factors is included in the analysis as a primary dimension. University students form their overall higher education service quality perceptions based on the aggregate perceptions of four primary dimensions (Interaction Quality, Physical Environment Quality, Outcome Quality, and Social Factors Quality). The empirical results of this current study also confirm the validation of using four primary dimensions to conceptualise higher education service quality. In addition, this study identifies the relative importance of primary dimensions of higher education service quality construct for the HEIs. Outcome Quality is the most important primary dimension of overall higher education service quality construct as assess by the students followed by Social Factors Quality, Interaction Quality, and Physical Environment Quality. The findings of this study provide empirical evidence for the inclusion of Social Factors Quality as a primary dimension of the overall higher education service quality. Moreover, identifying and confirming the importance of social factors as a fourth primary dimension of the overall higher education service quality provides a framework for further studies on educational service quality.

The fourth contribution is that a multi-group analysis was conducted in order to investigate the perceptual differences of the interrelationships among the higher order constructs (Service Quality, Student Satisfaction, Student Involvement, University Image, and Student Loyalty) across the Gender

Groups and the Years-of-study Groups (First Year and Third Year students). To date, no published research has examined the impact of gender and years-of-study on the perceptions of students regarding the interrelationships among the higher order constructs in a global educational context or for China's Higher Education Sector. This study explores the role of gender and years-of-study in moderating the interrelationships among the higher order constructs in the higher educational context. The results of this current study show the role of gender in moderating the effect of Student Involvement on University Image and the role of years-of-study in moderating the effect of Student Involvement on University Image. In addition, this current study contributes to the service marketing literature by examining the measurement invariance and structural invariance of a comprehensive hierarchical path model within a higher education contextual framework.

6.6 Practical Implications

Establishing and implementing effective marketing strategies that drive student loyalty is critical for the HEIs management as the HEIs represented in the sample of this study are operating in an intensively competitive environment. The comprehensive hierarchical modelling framework used in this current research provides a modelling and measurement framework that will enable HEI practitioners to establish effective marketing strategies and tactics to ensure the sustainability of their organisation.

In particular, understanding the complex nature of the interrelationships between the five service marketing constructs (Service Quality, Student Satisfaction, Student Involvement, University Image, and Student Loyalty) in a higher educational context (See the discussion of the interrelationships among the higher order constructs in Section 6.3) provides valuable information for management. A thorough understanding of the interrelationships among the higher order constructs is crucial for HEI management to maintain and/or enhance their organization's perceptual position in HEI market. For example, Allen and Robbins (2008) note that students' satisfaction with their academic environment is critical for the sake of academic integration and students' continuing commitment to the university. Higher education marketers who intend to increase the level of student satisfaction, need to focus on how to establish and maintain a positive university image and how to deliver a superior level of higher education service quality. Moreover, higher education marketers need to actively take actions to establish and maintain a good university image and ensure positive student satisfaction levels to build student loyalty to the HEIs. Loyal students manifest a willingness to deliver positive word-of-mouth, return to study for higher degrees, promote the HEIs in the market, and may recruit graduates from their HEI when they have established themselves in various industry settings.

Second, the comprehensive hierarchical modelling used in this study defines the benefit bundle for the management of the HEIs. The findings in this current study provide a robust and valid measurement instrument that can be used by higher education marketers as a tool to identify and assess the primary dimensions driving students' perceptions of higher education service quality. The empirical results of this current study provide the HEI practitioners with insights into how university students conceptualise higher education service quality. The in-depth information can be used to formulate higher education service quality improvement programs that will encourage student involvement with the HEI. Delivering superior service quality is particularly critical in a long-duration and high customer involvement service (as represented by HEIs), since students are involved in the service process for an extended period and experience numerous service products during their study period in the HEIs.

Third, there are several resource implications associated with identifying and understanding which primary dimensions drive higher education service quality and their relative level of importance. The modelling framework in this current study allows the higher education service quality construct to be assessed systematically. Therefore, HEI management are able to measure the students' perceptions of higher education at a global level, at the primary dimensional level, or at both of the two levels according to their strategic requirements. For example, if problems occur that effect the overall level of higher education service quality, higher education marketers can pin point the problems by measuring their performance on the four primary dimensions of higher education service quality confirmed in this study. Then, higher education marketers can narrow the problem area and facilitate solutions.

In addition, the modelling framework identifies the least to most important primary dimensions impacting on students' perceptions of higher education service quality to aid resource allocation. The comparative importance of the dimensions provides valuable information for developing and implementing marketing strategies and tactics for HEI management. Knowing the relative importance of the primary dimensions enables higher education marketers to allocate resources to the important dimensions and resource those less important dimensions appropriately. This ability enables the HEIs to strategic manage the drivers of higher education service quality in a cost effective manner. For example, the current results illustrate that Outcome Quality and Social Factors Quality are the main contributors to overall higher education service quality. Therefore, higher education marketers of the HEIs in the sample may need to highlight and allocate more effort and resources to Outcome Quality and Social Factors Quality since these two primary dimensions are more important to their students.

6.7 Limitations

This current research has some limitations that should be considered when interpreting the results presented in the study. First, the results of this study are based on a nonprobability sample (convenience sampling) that was drawn from two middle-tier universities in one city (Shanghai) in China. However, considering of the large number of enrolled university students in China's numerous and diverse higher education sector, the sample does not represent all of the university students in China. Therefore, the research results must be generalized with caution as students enrolled in the HEIs in other cities in China (for example, students in the HEIs in the northern cities) may have different perceptions of their educational experiences. For example, there may be regional cultural differences in the perceptions of students in the northern cities compared to those in the southern cities in China. Moreover, the research results must be generalized with caution to university students enrolled in other level-of-tier universities (for example, high-tier universities in China). The perceptions of students of higher education service quality may not be the same in different level-of-tier universities.

The data was collected for this study only from the undergraduate students who are studying in the universities sampled, however, postgraduate students who are studying their PhDs or Masters in the universities were not included in this research. Therefore, the generalization of the research results to the postgraduate students should be done with caution, as the perceptions of postgraduate students on higher education service quality and the interrelationships among the five higher order constructs may be different from the perceptions of undergraduate students.

The third limitation relates to the marketing constructs contained within the research model in this current study. This study focused on Student Loyalty, of which University Image and Student Satisfaction are important antecedents. Identification of other variables, besides University Image and Students Satisfaction, may also contribute to the understanding of student loyalty. The research model, for example, did not include student perceived value and trust which may have direct impact on student loyalty. These constructs may also have a mediating effect between service quality and student loyalty, and also student satisfaction and student loyalty.

The fourth limitation relates to the controlling of common method variance in this current study. Since only the procedural remedies were used to eliminate or minimize the common issues through the design of the study, for instance the improvement of scale items. The statistical remedy was not applied to diagnose common method variance (Krishnaveni and Deepa, 2013).

6.8 Directions for Future Research

As Student Loyalty of researched two universities in this current study to a large extent is driven by University Image, these two universities can be said to be image-driven. Other HEIs, however, may be satisfaction-driven. Hence, future studies may compare satisfaction-driven HEIs with image-driven HEIs in order to explore whether any differences may exist between these two kinds of HEIs. In addition, the comparison of satisfaction-driven HEIs and image-driven HEIs may provide useful information for higher education marketers to make strategic decisions about reasonable allocation of limited resources to different activities.

Other service marketing constructs such as student perceived value and trust can be taken into consideration in the future studies as these constructs may possibly have a direct impact on student loyalty. Therefore, the comprehensive hierarchical model can be developed by adding these additional service marketing constructs and analysing the interrelationships among these constructs. In addition, the moderating and mediating effect of these variables (student perceived value and trust) on the relationship between service quality and student loyalty, and on student satisfaction and student loyalty may be tested in the future studies.

Future studies may extend the multi-group analysis to test students' perceptual differences relating interrelationships among the higher order constructs as well as students' perceptual differences of higher education service quality across the postgraduate students and the undergraduate students. Moreover, because of the regional cultural differences in China, future studies may extend to test measurement invariance and structural invariance of the comprehensive hierarchical model (including primary dimensions of higher education service quality) across the HEIs in the northern cities and the HEIs in the southern cities.

Future studies may apply the conceptual research model used in this current study as a framework to conceptualise and measure higher education service quality, as well as to predict student loyalty in other countries and in different cultural settings. A replication of the framework used in this current study in other settings will enhance the understanding of the dimensions of higher education service quality and the antecedents of student loyalty. However, researchers need to verify whether the four primary dimensions structure identified in this current study for China is suitable for the HEIs in other cultural settings as the service quality dimensions may vary. Moreover, researchers need to investigate the impact of culture on the interrelationships among the five higher order constructs identified in this study.

Appendix 1

Questionnaire

Commerce Division
P O Box 84
Lincoln University
Canterbury 8150
NEW ZEALAND
Telephone 64 03 325 2811
Fax 64 03 325 3630
www. Lincoln.ac.nz

Dear Student
I am a Doctor of Philosophy student at Lincoln University in Christchurch, New Zealand. My research project involves asking students about their perceptions of their experiences with the higher education sector in China.

You are invited to participate in this research as you are one of university students studying at _____University. Attached is a brief questionnaire, which should only take about 5 to 8 minutes to complete. Your answers will be **completely anonymous**. There are no questions that identify you as an individual and all responses will be used for aggregate data analysis only. However, in order to qualify for this research, you must be a university student and be at least eighteen years old. This research is for my postgraduate research only. It does not relate to _____ University's subject or lecturer evaluations. This research is completely voluntary in nature and you are free to decide not to participate at any time during the process of completing the questionnaire. **However, if you choose to complete the survey, it will be understood that you have consented to participate in the research project and to publication of the results of the research project.** This research has been reviewed and approved by the Lincoln University Human Ethics Committee.

Please return the completed questionnaire to me and you will receive a gift (ballpoint pen) as appreciation for providing assistance with this research. I will be pleased to discuss any concerns you have on the research. I can be contacted by telephoning (0086)13501983443, or by emailing Jiani.Yan@lincolnuni.ac.nz. You can also contact my supervisors Mr. Michael D. Clemes: Mike.Clemes@lincoln.ac.nz and /or Dr. Baiding Hu: Baiding.Hu@lincoln.ac.nz.

Thank you for your time and cooperation; I greatly appreciate your help in furthering this research endeavour.

Yours sincerely,

Jiani Yan
PhD Candidate
Lincoln University

A Survey of Higher Education students in Shanghai, China

QUESTIONNAIRE

FOR POSTGRADUATE RESEARCH

This questionnaire is designed for the researcher's postgraduate research only. It does not relate to _____ University's subject or lecturer evaluations. This questionnaire consists of 6 sections (A-F). Please answer all the questions in each section. Below are a series of statements that relate to your overall experiences as a university student in the higher education sector in China. Please indicate how strongly you agree or disagree with each of the following statements. On a scale of 1 to 7, 1= you strongly disagree and 7= you strongly agree. Please circle your answers.

Section A Interaction Quality

	Strongly Disagree						Strongly Agree
1. Lecturers have good communication skills.	1	2	3	4	5	6	7
2. Classes are well prepared and organized.	1	2	3	4	5	6	7
3. Lecturers are friendly and helpful.	1	2	3	4	5	6	7
4. My lecturers are available during their office hours.	1	2	3	4	5	6	7
5. My lecturers deal with my problems in a concerned fashion.	1	2	3	4	5	6	7
6. My lecturers encourage students to participate in class discussions.	1	2	3	4	5	6	7
7. Faculty administrators perform their duties properly.	1	2	3	4	5	6	7
8. Overall, the quality of my interaction with the university staff is excellent.	1	2	3	4	5	6	7
9. I rate the quality of my interactions with the University.	1	2	3	4	5	6	7

Section B Physical Environment Quality

	Strongly Disagree						Strongly Agree
1. The classrooms provide a pleasant learning environment.	1	2	3	4	5	6	7
2. The campus has excellent supporting facilities (e.g. accommodation, canteen, and supermarket).	1	2	3	4	5	6	7
3. There are enough self-study rooms during the examination period.	1	2	3	4	5	6	7
4. The recreational facilities meet students' fitness needs.	1	2	3	4	5	6	7
5. The computers are accessible for students.	1	2	3	4	5	6	7
6. The library is a good place to study.	1	2	3	4	5	6	7
7. The university provides a safe living environment on campus.	1	2	3	4	5	6	7

8. Overall, the physical environment provided by the university is excellent.	1	2	3	4	5	6	7
9. I rate the university's physical environment highly.	1	2	3	4	5	6	7

Section C Outcome Quality							
	Strongly Disagree						**Strongly Agree**
1. I have gained a background and specialization for further education in a professional discipline.	1	2	3	4	5	6	7
2. I have developed the ability to apply theory to practice.	1	2	3	4	5	6	7
3. I have gained the ability to work in a team.	1	2	3	4	5	6	7
4. I have developed communication skills (e.g. oral presentation, report writing).	1	2	3	4	5	6	7
5. I have developed personal skills (e.g. problem solving, time management)	1	2	3	4	5	6	7
6. Overall, the quality of my learning experience at the university is excellent.	1	2	3	4	5	6	7
7. I evaluate my learning outcomes at the university highly.	1	2	3	4	5	6	7

Section D Social Factors Quality							
	Strongly Disagree						**Strongly Agree**
1. I am offered an opportunity to participate in a variety of extra-curricular activities to share my own interests with others.	1	2	3	4	5	6	7
2. I enjoy interacting with other students at on-campus social activities.	1	2	3	4	5	6	7
3. If my friends attend on-campus social activities, it also encourage me to participate.	1	2	3	4	5	6	7
4. The extra-curricular activities offered by the university make me feel good about my university experience.	1	2	3	4	5	6	7
5. Attending social practice activities enhances my interaction with other people.	1	2	3	4	5	6	7
6. Overall, the quality of my social experience at the university is excellent.	1	2	3	4	5	6	7
7. I evaluate my social experience at the university highly.	1	2	3	4	5	6	7

Section E Higher - Order Constructs							
	Strongly Disagree						**Strongly Agree**
Service quality							
1. The university delivers superior services in every way.	1	2	3	4	5	6	7
2. The services offered by the university always meet my expectations.	1	2	3	4	5	6	7
3. The university consistently provides high quality services.	1	2	3	4	5	6	7
4. I think that the service quality offered by the university is excellent.	1	2	3	4	5	6	7
5. Overall, I am satisfied with the university's service quality.	1	2	3	4	5	6	7
Student satisfaction							
1. My choice to be a _____university student is a wise one.	1	2	3	4	5	6	7
2. I have had a satisfying experience at the university.	1	2	3	4	5	6	7
3. The university provides a satisfying learning experience.	1	2	3	4	5	6	7
4. The university provides a satisfying social life experience.	1	2	3	4	5	6	7
5. I am satisfied with my overall university experience.	1	2	3	4	5	6	7
Student involvement							
1. I cut class quite often due to many reasons (e.g. oversleep, other commitments).	1	2	3	4	5	6	7
2. I participate actively in class discussions.	1	2	3	4	5	6	7
3. I spend enough time on study every day (e.g. preview, review, reading academic resources).	1	2	3	4	5	6	7
4. I always complete my assignments on time and independently.	1	2	3	4	5	6	7
5. I use different facilities at the university regularly (e.g. library, computer lab, self-study rooms).	1	2	3	4	5	6	7
University image							
1. I have always had a good impression of the university.	1	2	3	4	5	6	7
2. In my opinion, the university has a good image in the minds of students.	1	2	3	4	5	6	7
3. The university has a good reputation.	1	2	3	4	5	6	7
4. Generally, the university always fulfils its promises.	1	2	3	4	5	6	7
5. I rate the image of this university highly.	1	2	3	4	5	6	7

Student loyalty

1. I intend to complete my bachelor degree at this university.	1	2	3	4	5	6	7
2. This university will be my first choice for my further study.	1	2	3	4	5	6	7
3. I will recommend the university to others.	1	2	3	4	5	6	7
4. I say positive things about the university to others.	1	2	3	4	5	6	7
5. I will encourage friends and relatives to go to the university.	1	2	3	4	5	6	7

Section F Demographic Characteristics

Please tick the appropriate answer to each question

1 What is your gender? ☐ Male ☐ Female

2 What is your age? ☐ 18-22 ☐ 23-27 ☐ 27+

3 What is your year of study? ☐ 1st Year ☐ 3rd Year

4 What is your major? _____

5 What is your average GPA? ☐ 3.5-4.0

☐ 3.0-3.4

☐ 2.5-2.9

☐ 2.0-2.4

☐ 1.5-1.9

☐ 1.0-1.4

☐ Below 1.0

Thank you very much for your time!

Appendix 2

Normality Test

Table A2- 1 Skewness and Kurtosis Table (N=370)

Descriptive Statistics

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
IQ1	370	-.510	.127	-.114	.253
IQ2	370	-.810	.127	.307	.253
IQ3	370	-.844	.127	.322	.253
IQ4	370	-.363	.127	-.466	.253
IQ5	370	-.376	.127	-.666	.253
IQ6	370	-.572	.127	-.408	.253
IQ7	370	-.585	.127	-.247	.253
IQ8	370	-.523	.127	-.358	.253
IQ9	370	-.538	.127	-.191	.253
PEQ1	370	-.821	.127	.211	.253
PEQ2	370	-.609	.127	-.006	.253
PEQ3	370	-.658	.127	-.620	.253
PEQ4	370	-.431	.127	-.753	.253
PEQ5	370	-.826	.127	.175	.253
PEQ6	370	-1.130	.127	.882	.253
PEQ7	370	-.845	.127	.302	.253
PEQ8	370	-.951	.127	.869	.253
PEQ9	370	-.678	.127	.216	.253
OQ1	370	-.206	.127	-.309	.253
OQ2	370	-.160	.127	-.421	.253
OQ3	370	-.552	.127	-.026	.253
OQ4	370	-.324	.127	-.182	.253
OQ5	370	-.441	.127	-.118	.253
OQ6	370	-.517	.127	-.045	.253
OQ7	370	-.528	.127	-.036	.253
SFQ1	370	-.661	.127	-.017	.253
SFQ2	370	-.678	.127	.021	.253
SFQ3	370	-.802	.127	.309	.253
SFQ4	370	-.628	.127	.113	.253
SFQ5	370	-.892	.127	.478	.253
SFQ6	370	-.833	.127	.691	.253
SFQ7	370	-.565	.127	.041	.253
SQ1	370	-.173	.127	-.076	.253
SQ2	370	.026	.127	-.017	.253
SQ3	370	-.033	.127	-.193	.253
SQ4	370	-.020	.127	-.261	.253

SQ5	370	-.107	.127	.126	.253
SS1	370	-.132	.127	-.152	.253
SS2	370	-.225	.127	-.294	.253
SS3	370	-.069	.127	-.424	.253
SS4	370	-.107	.127	-.388	.253
SS5	370	-.164	.127	-.226	.253
SI1	370	.975	.127	-.134	.253
SI2	370	.052	.127	-.404	.253
SI3	370	.180	.127	.022	.253
SI4	370	-.144	.127	-.413	.253
SI5	370	-.125	.127	-.270	.253
UI1	370	-.054	.127	-.289	.253
UI2	370	.088	.127	-.315	.253
UI3	370	.105	.127	-.137	.253
UI4	370	-.092	.127	-.260	.253
UI5	370	-.089	.127	-.188	.253
SL1	370	-.850	.127	.155	.253
SL2	370	.097	.127	-.823	.253
SL3	370	-.141	.127	-.071	.253
SL4	370	-.144	.127	-.473	.253
SL5	370	-.081	.127	-.296	.253
Valid N (listwise)	370				

Appendix 3

Table A3- 1 Correlation Matrix (Interaction Quality)

Correlation Matrix								
		IQ1	IQ2	IQ3	IQ4	IQ5	IQ6	IQ7
Correlation	IQ1	1.000	.676	.632	.477	.608	.574	.528
	IQ2	.676	1.000	.681	.474	.626	.521	.545
	IQ3	.632	.681	1.000	.546	.665	.499	.512
	IQ4	.477	.474	.546	1.000	.691	.505	.521
	IQ5	.608	.626	.665	.691	1.000	.634	.614
	IQ6	.574	.521	.499	.505	.634	1.000	.590
	IQ7	.528	.545	.512	.521	.614	.590	1.000

Table A3- 2 The Anti-Image Correlation Matrix (Interaction Quality)

Anti-image Matrices								
		IQ1	IQ2	IQ3	IQ4	IQ5	IQ6	IQ7
Anti-image Covariance	IQ1	.436	-.138	-.086	-.005	-.028	-.098	-.032
	IQ2	-.138	.408	-.134	.017	-.048	-.014	-.063
	IQ3	-.086	-.134	.415	-.057	-.084	.011	-.011
	IQ4	-.005	.017	-.057	.496	-.164	-.029	-.063
	IQ5	-.028	-.048	-.084	-.164	.324	-.096	-.065
	IQ6	-.098	-.014	.011	-.029	-.096	.499	-.131
	IQ7	-.032	-.063	-.011	-.063	-.065	-.131	.519
Anti-image Correlation	IQ1	.910[a]	-.327	-.203	-.012	-.075	-.211	-.068
	IQ2	-.327	.893[a]	-.326	.037	-.132	-.032	-.137
	IQ3	-.203	-.326	.907[a]	-.126	-.230	.024	-.023
	IQ4	-.012	.037	-.126	.896[a]	-.409	-.059	-.124
	IQ5	-.075	-.132	-.230	-.409	.883[a]	-.239	-.159
	IQ6	-.211	-.032	.024	-.059	-.239	.915[a]	-.257
	IQ7	-.068	-.137	-.023	-.124	-.159	-.257	.934[a]
a. Measures of Sampling Adequacy(MSA)								

Table A3- 3 Percentage of Variance Criterion (Interaction Quality)

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.471	63.878	63.878	4.471	63.878	63.878
2	.657	9.391	73.269			
3	.561	8.020	81.289			
4	.424	6.062	87.351			
5	.338	4.824	92.175			
6	.296	4.223	96.398			
7	.252	3.602	100.000			

Extraction Method: Principal Component Analysis.

Appendix 4

Table A4- 1 Correlation Matrix (Physical Environment Quality)

Correlation Matrix								
		PEQ1	PEQ2	PEQ3	PEQ4	PEQ5	PEQ6	PEQ7
Correlation	PEQ1	1.000	.642	.469	.606	.604	.498	.456
	PEQ2	.642	1.000	.585	.614	.545	.560	.492
	PEQ3	.469	.585	1.000	.606	.403	.417	.504
	PEQ4	.606	.614	.606	1.000	.582	.491	.451
	PEQ5	.604	.545	.403	.582	1.000	.540	.424
	PEQ6	.498	.560	.417	.491	.540	1.000	.509
	PEQ7	.456	.492	.504	.451	.424	.509	1.000

Table A4- 2 The Anti-Image Correlation Matrix (Physical Environment Quality)

Anti-image Matrices

		PEQ1	PEQ2	PEQ3	PEQ4	PEQ5	PEQ6	PEQ7
Anti-image Covariance	PEQ1	.461	-.132	.000	-.093	-.131	-.024	-.047
	PEQ2	-.132	.424	-.120	-.063	-.037	-.102	-.036
	PEQ3	.000	-.120	.524	-.161	.029	.003	-.139
	PEQ4	-.093	-.063	-.161	.440	-.113	-.031	-.006
	PEQ5	-.131	-.037	.029	-.113	.512	-.122	-.031
	PEQ6	-.024	-.102	.003	-.031	-.122	.559	-.145
	PEQ7	-.047	-.036	-.139	-.006	-.031	-.145	.614
Anti-image Correlation	PEQ1	.895[a]	-.299	.001	-.205	-.270	-.048	-.089
	PEQ2	-.299	.896[a]	-.254	-.146	-.080	-.209	-.070
	PEQ3	.001	-.254	.864[a]	-.336	.055	.005	-.245
	PEQ4	-.205	-.146	-.336	.889[a]	-.239	-.062	-.011
	PEQ5	-.270	-.080	.055	-.239	.893[a]	-.229	-.056
	PEQ6	-.048	-.209	.005	-.062	-.229	.903[a]	-.248
	PEQ7	-.089	-.070	-.245	-.011	-.056	-.248	.907[a]

a. Measures of Sampling Adequacy(MSA)

Table A4- 3 Percentage of Variance Criterion (Physical Environment Quality)

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.153	59.335	59.335	4.153	59.335	59.335
2	.687	9.812	69.147			
3	.638	9.119	78.266			
4	.455	6.496	84.762			
5	.428	6.112	90.874			
6	.335	4.790	95.664			
7	.304	4.336	100.000			

Extraction Method: Principal Component Analysis.

Appendix 5

Table A5- 1 Correlation Matrix (Outcome Quality)

Correlation Matrix

		OQ1	OQ2	OQ3	OQ4	OQ5
Correlation	OQ1	1.000	.841	.667	.702	.668
	OQ2	.841	1.000	.736	.759	.725
	OQ3	.667	.736	1.000	.781	.745
	OQ4	.702	.759	.781	1.000	.833
	OQ5	.668	.725	.745	.833	1.000

Table A5- 2 The Anti-Image Correlation Matrix (Outcome Quality)

Anti-image Matrices

		OQ1	OQ2	OQ3	OQ4	OQ5
Anti-image Covariance	OQ1	.281	-.155	-.011	-.023	-.013
	OQ2	-.155	.220	-.057	-.035	-.028
	OQ3	-.011	-.057	.327	-.085	-.060
	OQ4	-.023	-.035	-.085	.228	-.128
	OQ5	-.013	-.028	-.060	-.128	.274
Anti-image Correlation	OQ1	.839[a]	-.624	-.037	-.092	-.045
	OQ2	-.624	.833[a]	-.213	-.155	-.113
	OQ3	-.037	-.213	.921[a]	-.312	-.200
	OQ4	-.092	-.155	-.312	.858[a]	-.514
	OQ5	-.045	-.113	-.200	-.514	.874[a]

a. Measures of Sampling Adequacy(MSA)

Table A5- 3 Percentage of Variance Criterion (Outcome Quality)

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.985	79.698	79.698	3.985	79.698	79.698
2	.440	8.804	88.502			
3	.264	5.284	93.787			
4	.162	3.231	97.018			
5	.149	2.982	100.000			

Extraction Method: Principal Component Analysis.

Appendix 6

Table A6- 1 Correlation Matrix (Social Factors Quality)

Correlation Matrix

		SFQ1	SFQ2	SFQ3	SFQ4	SFQ5
Correlation	SFQ1	1.000	.757	.603	.662	.651
	SFQ2	.757	1.000	.725	.709	.716
	SFQ3	.603	.725	1.000	.694	.733
	SFQ4	.662	.709	.694	1.000	.756
	SFQ5	.651	.716	.733	.756	1.000

Table A6- 2 The Anti-Image Correlation Matrix (Social Factors Quality)

Anti-image Matrices

		SFQ1	SFQ2	SFQ3	SFQ4	SFQ5
Anti-image Covariance	SFQ1	.389	-.157	.007	-.066	-.043
	SFQ2	-.157	.291	-.103	-.048	-.045
	SFQ3	.007	-.103	.366	-.067	-.110
	SFQ4	-.066	-.048	-.067	.345	-.126
	SFQ5	-.043	-.045	-.110	-.126	.321
Anti-image Correlation	SFQ1	.872[a]	-.466	.019	-.181	-.123
	SFQ2	-.466	.854[a]	-.316	-.153	-.148
	SFQ3	.019	-.316	.888[a]	-.189	-.322
	SFQ4	-.181	-.153	-.189	.895[a]	-.377
	SFQ5	-.123	-.148	-.322	-.377	.879[a]

a. Measures of Sampling Adequacy(MSA)

Table A6- 3 Percentage of Variance Criterion (Social Factors Quality)

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.805	76.100	76.100	3.805	76.100	76.100
2	.433	8.663	84.763			
3	.317	6.345	91.107			
4	.237	4.736	95.843			
5	.208	4.157	100.000			

Extraction Method: Principal Component Analysis.

Appendix 7

Table A7- 1 EFA results for Primary Dimensions using VARIMAX Rotation

Rotated Component Matrix[a]

	Component				
	1	2	3	4	5
IQ1			.748		
IQ2			.736		
IQ3			.694		
IQ4		.511			
IQ5			.615		
IQ6			.753		
IQ7			.528		
PEQ1		.759			
PEQ2		.590			
PEQ3		.688			
PEQ4		.708			
PEQ5		.691			
PEQ6					.582
PEQ7					.798
OQ1	.785				
OQ2	.864				
OQ3	.745				
OQ4	.804				
OQ5	.808				
SFQ1				.717	
SFQ2				.756	
SFQ3				.816	
SFQ4				.645	
SFQ5				.767	

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

Table A7- 2 Adjusted EFA results for Primary Dimensions using VARIMAX Rotation

Rotated Component Matrix[a]

	Component			
	1	2	3	4
IQ1				.803
IQ2				.761
IQ3				.695
IQ5				.571
IQ6				.763
IQ7				.519
PEQ1		.800		
PEQ2		.661		
PEQ3		.705		
PEQ4		.742		
PEQ5		.679		
OQ1	.795			
OQ2	.858			
OQ3	.751			
OQ4	.805			
OQ5	.793			
SFQ1			.721	
SFQ2			.758	
SFQ3			.823	
SFQ4			.626	
SFQ5			.796	

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Table A7- 3 Percentage of Variance Criterion (Primary Dimensions)

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.479	45.139	45.139	9.479	45.139	45.139	4.101	19.528	19.528
2	2.363	11.252	56.391	2.363	11.252	56.391	3.509	16.712	36.239
3	1.531	7.288	63.679	1.531	7.288	63.679	3.509	16.710	52.950
4	1.250	5.952	69.631	1.250	5.952	69.631	3.503	16.681	69.631
5	.903	4.302	73.933						
6	.679	3.233	77.166						
7	.610	2.905	80.071						
8	.554	2.636	82.707						
9	.513	2.444	85.150						
10	.457	2.176	87.326						
11	.413	1.965	89.291						
12	.366	1.743	91.034						
13	.333	1.588	92.622						
14	.320	1.522	94.144						
15	.281	1.337	95.481						
16	.230	1.096	96.577						
17	.186	.886	97.463						
18	.164	.781	98.244						
19	.141	.672	98.916						
20	.122	.580	99.496						
21	.106	.504	100.000						

Extraction Method: Principal Component Analysis.

References

Aaker, D. A., Kumar, V., Day, G. S., & Lawley, M. (2005). *Marketing research* (The Pacific Rim ed.): John Wiley & Sons Australia.

Abili, K., Thani, F. N., Mokhtarian, F., & Rashidi, M. M. (2011). Assessing quality gap of university services. Asian Journal on Quality, 12(2), 167-175.

Abdullah, F. (2006a). Measuring service quality in higher education: HEdPERF versus SERVPERF. *Marketing Intelligence and Planning, 24(1),* 31-47.

Abdullah, F. (2006b). Measuring service quality in higher education: three instruments compared. *International Journal of Research and Method in Education, 29(1),* 71-89.

Aga, M., & Safakli, O. V. (2007). An empirical investigation of service quality and customer satisfaction in professional accounting firms: Evidence from North Cyprus. *Problems and Perspectives in Management, 5(3),* 84-98.

Ainley, M. D. (1993). Styles of engagement with learning: Multidimensional assessment of their relationship with strategy use and school achievement. *Journal of Educational Psychology, 85(3),* 395-405.

Akter, A., D'Ambra, J., Ray, P., & Hani, U. (2013). Modelling the impact of mHealth service quality on satisfaction, continuance and quality of life. *Behaviour & Information Technology, 32(12),* 1225-1241.

Al-Alak, B. A. M. (2006). The impact of marketing actions on relationship quality in the higher education sector in Jordan. *Journal of Marketing for Higher Education, 16(2),* 1–23.

Al-Alak, B. A., & Alnaser, A. S. M. (2012). Assessing the relationship between higher education service quality dimensions and student satisfaction. *Australian Journal of Basic and Applied Sciences, 6(1),* 156-164.

Alexandris, K., Zahariadis, P., Tsorbatzoudis, C., & Grouios, G. (2004). An empirical investigation of the relationships among service quality, customer satisfaction and psychological commitment in a health club context. *European Journal of Sport Management, 4(1),* 36-52.

Ali, F., Zhou, Y., Hussain, K., Nair, P. K., & Ragavan, N. A. (2016). Does higher education service quality effect student satisfaction, image and loyalty? A study of international students in Malaysian public universities. *Quality Assurance in Education, 24(1),* 70 – 94.

Allen, J., & Robbins, S. B. (2008). Prediction of college major persistence based on vocational interests, academic preparation, and first-year academic performance. *Research in Higher Education, 49,* 62–79.

Alves, H., & Raposo, M. (2007). Conceptual Model of Student Satisfaction in Higher Education. *Total Quality Management, 18(5),* 571-588.

Alves, H. & Raposo, M. (2009). The measurement of the construct satisfaction in higher education. *The Service Industries Journal, 29(2),* 203-218.

Alves, H., & Raposo, M. (2010). The influence of university image on student behaviour. *International Journal of Educational Management, 24*(1), 73-85.

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: a review and recommended two-step approach. *Psychological bulletin, 103(3),* 411-423.

Anderson, J. C. & Gerbing, D. W. (1991). Predicting the performance of measures in a confirmatory factor analysis with a pretest assessment of their substantive validities. *Journal of Applied Psychology, 76(5),* 732.

Anderson, D. R., Sweeney, D. J. & Williams, T. A. (2009). *Statistics for business and economics (10th ed.).* OH: Thomson South-Western.

Andreassen, T., & Lindestad, B. (1998). The impact of corporate image in the formation of customer loyalty. *Journal of Service Research, 1(1),* 82-92.

Andrews, F. M. (1984). Construct validity and error components of survey measures: A structural modeling approach. *Public Opinion Quarterly, 48,* 409-448.

Angell, R. J., Heffernan, T. W., & Megicks, P. (2008). Service quality in postgraduate education. *Quality Assurance in Education, 16(3),* 236-254.

Annamdevula, S., & Bellamkonda, R. S. (2016). Effect of student perceived service quality on student satisfaction, loyalty and motivation in Indian universities: Development of HiEduQual. Journal of Modelling in Management, 11(2), 488 – 517.

Arambewela, R., & Hall, J. (2009). An empirical model of international student satisfaction. *Asia Pacific Journal of Marketing and Logistics, 21(4),* 555-569.

Arbuckle, J.K. (1997). *Amos Users' Guide Version 3.6,* Chicago, IL: SmallWaters.

Armstrong, J., & Overton, T. (1977). Estimating nonresponse bias in mail surveys. *Journal of Marketing Research, 14,* 396-402.

Arnett, D., German, S., & Hunt. S. (2003). The Identity Salience Model of Relationship Marketing Success: The Case of Nonprofit Marketing. *Journal of Marketing, 67(4),* 89-105.

Arpan, L., Raney, A., & Zivnuska, S. (2003). A cognitive approach to understanding university image. *Corporate Communications, 8(2),* 97-113.

Assael, Pope, Brenna, & Voges. (2007). *Consumer Behaviour* (First Asia-Pacific Edition ed.). Queensland: John Wiley & Sons Australia. Ltd.

Astin, A. W. (1984). Student involvement: A developmental theory for higher education. *Journal of College Student Personnel, 25,* 297-308.

Astin, A. (1985). *Achieving educational excellence: A critical assessment of priorities and practices in higher education.* San Francisco: Jossey-Bass.

Astin, A. (1993). *What matters in college? Four critical years revisited.* San Francisco: Jossey-Bass.

Astin, A. W. (1999). Student involvement: A developmental theory for higher education. *Journal of College Student Development, 40(5),* 518-531.

Athiyaman, A. (1997). Linking student satisfaction and service quality perceptions: the case of university education. *European Journal of Marketing, 31(7),* 528-540.

Awang, Z. (2012). *Structural equation modeling using AMOS* (Vol.8). Kelantan: Center of Graduate Studies University Teknologi Mara Kelantan.

Aydin, S., & Özer, G. (2005). The analysis of antecedents of customer loyalty in the Turkish mobile telecommunication market. *European Journal of Marketing, 39 (7/8),* 910-925.

Azman, I., Muhammad Madi, A., & Balakrishnan, P. (2009). Effect of service quality and perceive value on customer satisfaction. *International Journal of Management Perspective, 3(1),* 29 - 44.

Babakus, E., & Boller, G. W. (1992). An empirical assessment of the SERVQUAL scale. *Journal of Business Research, 24(3),* 253-268.

Babin, B. J., & Griffin, M. (1998). The nature of satisfaction: an updated examination and analysis. *Journal of Business Research, 41,* 127–136.

Back, K. –J. (2005). The effects of image congruence on customers' brand loyalty in the upper middle-class hotel industry. *Journal of Hospitality & Tourism Research, 29(4),* 448-467.

Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Academy of Marketing Science, 16(1),* 21.

Baird, L. L. (1990). The undergraduate experience: Commonalities and differences. *Research in Higher Education, 37(3),* 271-278.

Barbour, R. S., & Kitzinger, J. (1999). *Developing focus group research : politics, theory and practice.* London : SAGE

Barich, H., & Kolter, P. (1991). A Framework for Marketing Image Management. *Sloan Management Review, 32(2),* 94-103.

Baron, R. M., & Kenny, D. A. (1986). The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations *Journal of Personality and Social Psychology, 51(6),* 1173-1182.

Beard, L.A. & Harper, C. (2002). Student perceptions of Online versus On Campus Instruction. *Education, 122,* 658-663.

Berger, J., & Milem, J. (1999). The role of student involvement and perceptions of integration in a causal model of student persistence. *Research in Higher Education, 40(6),* 641–664.

Berkman, H. W., Lindquist, J. D., & Sirgy, M. J. (1997). *Consumer Behaviour.* NTC Publishing Group, Lincolnwood, IL.

Bernard, H. R. (2000). *Social research methods: Qualitative and quantitative approaches.* Thousand Oaks: CA: The United States: Sage Publications.

Bitner, M. J. (1990). Evaluating service encounters: the effects of physical surroundings and employee responses. *Journal of Marketing, 54(2),* 69-82.

Bitner, M. J. (1992). Servicescapes: The impact of physical surroundings on customers and employees. *Journal of Marketing*, *56(2),* 57.

Bloemer, J., & De Ruyter, K. (1998). On the relationship between store image, store satisfaction and store loyalty. *European Journal of Marketing, 32(5-6),* 499-513.

Bloemer, J., De Ruyter, K., & Peeters, P. (1998). Investigating drivers of bank loyalty: The complex relationship between image, service quality and satisfaction. International *Journal of Bank Marketing, 16(7),* 276–286.

Blunch, N. (2008). Introduction to structural equation *modelling using SPSS and AMOS.* Thousand Oaks, CA: Sage Publications Ltd.

Bollen, K. A. (2014). *Wiley Series in Probability and Statistics. (Vol. 210): Structural Equations with Latent Variables.* Somerset, NJ, USA.

Bolton, R. N., & Drew, J. H. (1991). A longitudinal analysis of the impact of service changes on customer attitudes. *Journal of Marketing, 55(1),* 1-9.

Bolton, R. N., & Lemon, K. N. (1999). A dynamic model of customers' usage of services: usage as an antecedent and consequence of satisfaction. *Journal of Marketing Research, 36(2),* 171-186.

Boomsma, A. (1983). *On the robustness of LISREL (maximum likelihood estimation) against small sample size and nonnormality.* University of Groningen, The Netherlands.

Borden, V. M. (1995). Segmenting student markets with a student satisfaction and priorities survey. *Research in Higher Education, 36(1),* 73–88.

Boulding, W., Kalra, A., Staelin, R., & Zeithaml, V. A. (1993). A dynamic process model of service quality: from expectations to behavioral intentions. *Journal of marketing research, 30(1),* 7-27.

Bowden, J. L-H., & D'Alessandro, S. (2011). Co-creating Value in Higher Education: The Role of Interactive Classroom Response Technologies. *Asian Social Science, 7(11),* 35-49.

Brady, M. K., & Cronin, J. J. (2001). Some new thoughts on conceptualizing perceived service quality: a hierarchical approach. *The Journal of Marketing, 65(3),* 34-49.

Brady, M. K., Cronin, J. J. & Brand, R. R. (2002). Performance-only measurement of service quality: A replication and extension. *Journal of Business Research, 55,* 17.

Brace, N., Kemp, R. & Snelgar, R. (2006). *SPSS for psychologists: A guide to data analysis using SPSS for Windows* (3rd). London: Lawrence Erlbaum Associates.

Brandenburg, U., & Zhu, J. (2007). *Higher education in China in the light of massification and demographic change: lessons to be learned for Germany.* Working paper, Centre for Higher Education Development, Gütersloh.

Brochado, A. (2009). Comparing alternative instruments to measure service quality in higher education. *Quality Assurance in Education, 17(2),* 174-190.

Brown, T. A. (2015). *Confirmatory Factor Analysis for Applied Research.* (2nd ed.). The Guilford Press, New York, United States.

Brown, R., & Mazzarol, T. (2009). The importance of institutional image to student satisfaction and loyalty within higher education. *Higher Education, 58(1),* 81-95.

Brown, T. J., Churchill, G. A., & Peter, J. P. (1993). Improving the Measurement of Service Quality. *Journal of Retailing, 69 (1),* 127-139.

Browne, B., Kaldenberg, D., Browne, W., & Brown, D. (1998). Student as customers: factors affecting satisfaction and assessments of institutional quality. *Journal of Marketing for Higher Education, 8(3),* 1-14.

Bryman, A. & Cramer, D. (2005). *Quantitative Data Analysis with SPSS 12 and 13: A Guide for Social Scientists.* NY: Routledge.

Bulger, M. E., Mayer, R. E., Almeroth, K. C., & Blau, S. D. (2008). Measuring learner engagement in computer-equipped college classrooms. *Journal of Educational Multimedia and Hypermedia, 17(2),* 129-143.

Burke, S., & Collins, K.M. (2001). Gender differences in leadership styles and management skills. *Women in Management Review, 16(5),* 244-257.

Bush, V., Ferrell, O. C., & Thomas Jr., J. L. (1998). Marketing the business school: An exploratory investigation. *Journal of Marketing Education, 20(1),* 16-23.

Butt, B. Z., & Rehman, K. U. (2010). A study examining the students satisfaction in higher education. *Procedia - Social and Behavioral Sciences, 2(2),* 5446-5450.

Buttle, F. (1996). SERVQUAL: Review, critique, research agenda. *European Journal of Marketing, 30(1),* 8-35.

Byrne, B. M. (1994). *Structural equation modeling with EQS and EQA/Windows- basic concepts, applications and programming.* Thousand Oaks, CA: Sage.

Byrne, B. M. (1998). *Structural equation modeling with LISREL, PRELIS, and SIMPLIS.* New Jersey: Lawrence Erlbaum Associates, Publishers.

Byrne, B. M. (2010). *Structural equation modeling with Amos: Basic concepts, applications and programming* (Vol. 2). New York: NY: Routledge: Taylor & Francis Group.

Campus Activities and Events. (2006). Retrieved from http://www.umain.edu/campusevents/

Cao, Q., Griffing, T. E., & Bai, X. (2009). The Importance of Synchronous Interaction for Student Satisfaction with Course Web Sites. *Journal of Information Systems Education, 20(3),* 331-338.

Cardona, M., & Bravo, J. (2012). Service quality perceptions in higher education institutions: the case of a Colombian university. *Estudios Gerenciales, 28(125),* 23-29.

Carman, J. M. (1990). Consumer perceptions of service quality: An assessment of the SERVQUAL dimensions. *Journal of Retailing, 66(1),* 33-55.

Carmines, E. G. & Zeiler, R. A. (1979). *Reliability and validity assessment.* Beverly Hills, CA: Sage.

Caruana, A. (2002). Service loyalty: the effects of service quality and the mediating role of customer satisfaction. *European Journal of Marketing, 36(7-8),* 811-828.

Caruana, A. (2004). The impact of switching costs on customer loyalty: A study among corporate customers of mobile telephony. *Journal of Targeting, Measurement and Analysis for Marketing, 12(3),* 256-268.

Caruana, A., Money, A. H., & Berthon, P. R. (2000). Service quality and satisfaction: The moderating role of value. European Journal of Marketing, 34(11/12), 1338-1353.

Carvalho, S.W., & de Oliveira Mota, M. (2010). The role of trust in creating value and student loyalty in relational exchanges between higher education institutions and their students. *Journal of Marketing for Higher Education, 20(1),* 145-165

Cassel, C., & Eklöf, J. A. (2001). Modelling customer satisfaction and loyalty on aggregate levels: Experience from the ECSI pilot study. *Total Quality Management, 12(7-8),* 834-841.

Chan, L. K., Hui, Y. V., Lo, H. P., Tse, S. K., Tso, G. K. F., & Wu, M. L. (2003). Consumer satisfaction index: new practice and findings. *European Journal of Marketing, 37(5/6),* 872-909.

Chapman, E. (2003). Alternative approaches to assessing student engagement rates. Practical Assessment, *Research & Evaluation, 8(13),* Retrieved April 23, 2014, from http://pareonline.net/getvn.asp?v=8&n=13

Chen, C. F., & Chen, F. S. (2010). Experience quality, perceived value, satisfaction and behavioural intentions for heritage tourists. *Tourism Management, 31(1),* 29-35.

Chen, C. M., Lee, H. T., Chen, S. H., Huang, T. H. (2011). Tourist behavioural intentions in relation to service quality and customer satisfaction in Kinmen National Park, Taiwan. *International Journal of Tourism Research, 13(5),* 416-432.

Chen, C. N., & Ting, S. C. (2002). A study using the grey system theory to evaluate the importance of various service quality factors. *International Journal of Quality & Reliability Management, 19(7),* 838-861.

Cheng, K. –W. (2014). A study on applying focus group interview on education. *Reading Improvement, 51(4),* 381.

Cheng, T. C. E., Lai, L. C. F. & Yeung, A. C. L. (2008). The driving forces of customer loyalty: A study of Internet service providers in Hong Kong. *International Journal of E-Business Research, 4(4),* 26.

Cheung, M. W. –L. (2013). Implementing restricted maximum likelihood estimation in structural equation models. *Structural Equation Modeling, 20(1),* 157-167.

Chinna, K. (2009). *Structural equation modeling using AMOS.* Presented at AMOS workshop, University Technology MARA, ShahAlam, Malaysia.

Chow, H. S. I., Lau, V. P., Thamis, W. C. L., Sha, Z., & Yun, H. (2007). Service quality in restaurant operations in China: Decision-and experiential-oriented perspectives. *International Journal of Hospitality Management, 26(3),* 698-710.

Chun, R. (2005). Corporate reputation: Meaning and measurement. *International Journal of Management Reviews, 7(2),* 91-109.

Chung, E., & McLarney, C. (2000). The classroom as a service encounter: Suggestions for value creation. *Journal of Marketing Education, 24(4),* 484–500.

Churchill, G. A. J. (1979). A paradigm for developing better measures of marketing construsts. *Journal of Marketing Research, 16(1),* 64-73.

Churchill, G. A., & Surprenant, C. (1982). An investigation into the determinants of customer satisfaction. *Journal of Marketing Research (pre-1986), 19(000004),* 491-504.

Clemes, M. D., Brush, J. G., & Collins, J. M. (2011). Analysing the professional sport experience: a hierarchical approach. *Sport Management Review, 94,* 1-19.

Clemes, M. D., Cohen, D. A., & Wang, Y. (2013). Understanding Chinese university students' experiences: an empirical analysis. *Asia Pacific Journal of Marketing and Logistics, 25(3),* 391-427.

Clemes, M. D., Gan, C. E. C., & Kao, T-H. (2008). University Student Satisfaction: An Empirical Analysis. *Journal of Marketing for Higher Education, 17(2),* 292-325.

Clemes, M. D., Gan, C., & Ren, M. (2011). Synthesizing the effects of service quality, value, and customer satisfaction on behavioural intentions in the motel industry an empirical analysis. *Journal of Hospitality & Tourism Research, 35(4),* 530-568.

Clemes, M. D., Gan, C., & Zhang, J. L. (2014). An empirical analysis of online shopping adoption in Beijing, China. *Journal of Retailing and Consumer Services, 21(3),* 364-375.

Clemes, M. D., Ozanne, L. K., & Tram, L. (2001). An examination of students' perceptions of service quality in higher education. *Journal of Marketing for Higher Education, 10(3),* 1-19.

Clemes, M.D., Shu, X., & Gan, C. (2014). Mobile communications: a comprehensive hierarchical modelling approach. *Asia Pacific Journal of Marketing and Logistics, 26(1),* 114-146.

Clemes, M. D., Wu, J. H. C., Hu, B. D., & Gan, C. (2009). An empirical study of behavioural intentions in the Taiwan hotel industry. *Innovative Marketing, 5(3),* 30-50.

Clow, K. E., & Vorhies, D. E. (1993). Building a competitive advantage for service firms. *Journal of Services Marketing, 7(1),* 22-23.

Clubs and Organizations. (2006). Retrieved from http://www/aug.edu/student_activities/clubs_and_organizations.htm

Cronin, J. J., Brady, M., & Hult, G. T. (2000). Assessing the effects of quality, value and customer satisfaction on consumer behavioral intentions in service environments. *Journal of Retailing, 76(2),* 193-218.

Cronin, J. J., & Taylor, S. A. (1992). Measuring service quality: A reexamination and extension. *Journal of Marketing, 56*(3), 55-68.

Cronin, J. J., & Taylor, S. A. (1994). SERVPERF versus SERVQUAL: reconciling performance-based and perceptions-minus-expectations measurement of service quality. *The Journal of Marketing, 58(1),* 125-131.

Constantin, A., & Voicu, M. (2015). Attitudes towards gender roles in cross-cultural surveys: Content Validity and cross-cultural measurement invariance. *Social Indicators Research, 123(3),* 733-751.

Cooper, D. R. & Schindler, P. S. (2003). *Business research methods* (8th Ed). New York: McGraw-Hill.

Cynthia, W. (1997). Effects of researcher presence and appeal on response quality in hand-delivered, self-administered surveys. *Journal of Business Research, 38(2),* 105-114.

Dabholkar, P. A., Shepherd, C. D. & Thorpe, D.I . (2000). A comprehensive framework for service quality: an investigation of critical conceptual and measurement issues through a longitudinal study. *Journal of Retailing, 76 (2),* 131-139.

Dabholkar, P. A., Thorpe, D. I., & Rentz, J. O. (1996). A measure of service quality for retail stores: Scale development and validation. *Journal of the Academy of Marketing Science, 24*(1), 3-16.

Dado, J., Petrovicova, J. T., Cuzovic, S., & Rajic, T. (2012). An empirical examination of the relationships between service quality, satisfaction and behavioural intentions in higher education setting. *Serbian Journal of Management, 7(2),* 203 – 218.

Dagger, T. S., Sweeney, J. C., & Johnson, L. W. (2007). A hierarchical model of health service quality: Scale development and investigation of an integrated model. *Journal of Service Research*, *10*(2), 123-142.

Dehghan, A., Dugger, J., Dobrzykowski, D., & Balazs, A. (2014). The antecedents of student loyalty in online programs. *International Journal of Educational Management, 28(1),* 15-35.

De Jager, J., & Gbadamosi, G. (2013). Predicting students' satisfaction through service quality in higher education. *International Journal of Management Education, 11(3),* 107-118.

De Ruyter, K., Wetzels, M. & Bloemer, J. (1998). On the Relationship between Service Quality, Service Loyalty and Switching Cost. *International Journal of Service Industry Management, 9(5),* 436-453.

DeVellis, R.F. (2012). *Scale development: Theory and applications* (3rd ed.). Thousand Oaks, CA: Sage.

Diamantopoulos, A. & Siguaw, J. A. (2000). *Introducing LISREL*. London: Sage.

Díaz-Méndez, M., & Gummesson, E. (2012). Value co-creation and university teaching quality. *Journal of Service Management, 23(4),* 571–592.

Dick, A. S., & Basu, K. (1994). Customer loyalty: toward an integrated conceptual framework. *Journal of the Academy of Marketing Science, 22(2),* 99-113.

Dillman, D. A. (2000). *Mail and internet surveys: The tailored design method*. New York: John Wiley & Sons, Inc.

Di Pietro, L., Guglielmetti Mugion, R., Musella, F., Renzi, M. F., & Vicard, P. (2015). Reconciling internal and external performance in a holistic approach: A Bayesian network model in higher education. *Expert Systems with Applications, 42,* 2691–2702.

Douglas, J., McClelland, R., & Davies, J. (2008). The development of a conceptual model of student satisfaction with their experience in higher education. *Quality Assurance in Education, 16(1),* 19-35.

Drăgan, M., Ivana, D., & Arba, R. (2014). Business Process Modeling in Higher Education Institutions. Developing a Framework for Total Quality Management at Institutional Level. *Procedia Economics and Finance, 16,* 95-103.

Duan, X. (2003). Chinese higher education enters a new era. *Academic, 89(6),* 22-27.

Duncan, E., & Elliot, G. (2002). Customer service quality and financial performance among Australian retail financial institutions. *Journal of Financial Services Marketing, 7(1),* 25-41.

Dunleavy, J., & Milton, P. (2009). *What did you do in school today? Exploring the concept of student engagement and its implications for teaching and learning in Canada.* Toronto: Canadian Education Association.

Easterby-Smith, M., Thorpe, R. & Lowe, A. (2008). *Management research: an introduction* (3rd ed.). London:Sage.

Edmunds, H. (1999). *The focus group research handbook.* Lincolnwood, Ill.: NTC Business Books.

Ehigie, B. O. (2006). Correlates of customer loyalty to their bank: a case study in Nigeria. *International Journal of Bank Marketing, 24(7),* 494-508.

Ehigie, B. Q., & Taylor, M. (2009). Managing students' loyalty to school after graduation through relationship marketing. *The TQM Journal, 21(5),* 502-516.

Ehrenberg, A. S. C. (1988). *Repeat buying: Facts, theory and applications*. Oxford University Press, Oxford.

Einasto, O. (2014). E-service Quality Criteria in University Library: A Foucus Group Study. *Procedia - Social and Behavioral Sciences, 147,* 561-566.

Ekinci, Y., Dawes, P. L., & Massey, G. R. (2008). An extended model of the antecedents and consequences of consumer satisfaction for hospitality services. *European Journal of Marketing, 42(1-2),* 35-68.

Elliott, K. M., Hall, M. C., & Stiles, G. W. (1993). Service quality in the health care industry: How are hospitals evaluated by the general public? *Journal of Hospital Marketing, 7(1),* 113-124.

Elliott, K. M., & Shin, D. (2002). Student Satisfaction: An alternative approach to assessing this important concept. *Journal of Higher Education Policy and Management, 24(2),* 197-209.

Endres, M., Chowdhury, S., Frye, C., & Hurtubs, C. (2009). The multifaceted nature of omline MBA student satisfaction and impacts on behavioral intentions. *Journal of Education for Business, 84(5),* 304-312.

Eurico, S. T., Da Silva, J. A. M., & Do Valle, P. O. (2015). A model of graduates' satisfaction and loyalty in tourism higher education: The role of employability. *Journal of Hospitality, Leisure, Sport & Tourism Education, 16,* 30-42.

Euromonitor International. (2015, Jan). *Shanghai City Review.* Retrieved May 26, 2015 from http://www.euromonitor.com/shanghai-city-review/report

Fassnacht, M., & Koese, L. (2006). Quality of electronic services: Conceptialising and testing a hierarchical model. *Journal of Service Research, 9(1),* 19-37.

Faullant, R., Matzler, K., & Füller, J. (2008). The impact of satisfaction and image on loyalty: the case of Alpine ski resorts. *Managing Service Quality, 18(2),* 163-178.

Fernandes, C., Ross, K., & Meraj, M. (2013). Understanding student satisfaction and loyalty in the UAE HE sector. *International Journal of Educational Management, 27(6),* 613-630.

Field, A. (2009). *Discovering statistics using SPSS*: Sage publications.

Fink, A. & Kosecoff, J. (1998). *How to conduct surveys: A step-by-step guide* (2nd ed.). Thousand Oaks, CA: Sage.

Finn, J. D., & Rock, D. A. (1997). Academic success among students at risk for school failure. *Journal of Applied Psychology, 82(2),* 221-234.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research.* Reading, MA: Addison-Wesley.

Flowers, L. A. (2004). Examining the Effects of Student Involvement on African American College Student Development*. Journal of College Student Development, 45(6),* 633- 654.

Ford, J. B., Joseph, M., & Joseph, B. (1999). Importance-performance analysis as a strategic tool for service marketers: the case of service quality perceptions of business students in New Zealand and the USA. *The Journal of Services Marketing, 13(2),* 171.

Fornell, C. (1992). A national customer satisfaction barometer: The Swedish experience. *Journal of Marketing, 56(1),* 6–21.

Fornell, C., Johnson, M. D., Anderson, E. W., Cha, J. & Bryant, B. E. (1996). The American customer satisfaction index: nature, purpose, and findings. *Journal of Marketing, 60(4),* 7-18.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error*. Journal of Marketing Research, 18(1),* 39-50.

Fornell, C., Mithas, S., Morgenson, F. V. III & Krishon, M. S. (2006). Customer satisfaction and stock prices: high return, low risk. *Journal of Marketing, 70(1),* 3-14.

Fournier, S. & Yao, J. L. (1997). Reviving brand loyalty: A conceptualization within the framework of consumer-brand relationship. *International Journal of Research in Marketing*, *14(5),* 451-472.

Fraser, B. J. (1994). *Research on classroom and school climate,* in: D. GABEL (Ed.) Handbook of Research on Science Teaching and Learning, 493–541.

Frazier, P. A., Tix, A. P., & Barron, K. E. (2004). Testing Moderator and Mediator Effects in Counseling Psychology Research. *Journal of Counseling Psychology, 51(1),* 115-134.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: potential of the concept, state of the evidence. *Review of educational research, 74(1),* 59-109.

Gallarza, M. G., & Gil-Saura, I. (2006). Value dimensions, perceived value, satisfaction and loyalty: an investigation of university students' travel behaviour. *Tourism Management, 27(3),* 437-452.

Gao, Y., & Wei, W. (2007). Measuring service quality and satisfaction of student in Chinese business education. In Alfred University Press 9Eds). *Management challenges in global world: Proceedings of the Sixth Wuhan International Conference on E-Business, Wuhan, 26-27,* 2329-2336.

García-Aracil, A. (2009). European graduates' level of satisfaction with higher education. *Higher Education, 57(1),* 1-21.

González, M. E. A., Comesaña, L. R., & Brea, J. A. F. (2007). Assessing tourist behavioural intentions through perceived service quality and customer satisfaction. *Journal of Business Research, 60(2),* 153-160.

Gremler, D. D. & Brown, S. W. (1996). Service Quality: Its Nature, Importance, and Implications. *Advancing Service Quality - A Global Perspective,* New York: ISQA, 171-180.

Grönroos, C. (1982). An applied service marketing theory. *European Journal of Marketing, 16(7),* 30.

Grönroos, C. (1984). A Service Quality Model and its Marketing Implications. *European Journal of Marketing, 18(4),* 36 – 44.

Grönroos, C. (2001). The perceived service quality concept – a mistake? *Managing Service Quality, 11(3),* 150-152.

Gunderson, M. A., Gray, A. W., & Akridge, J. T. (2009). Service Quality in Agronomic Inputs: Does the Hierarchical Model Apply? *Agribusiness, 25 (4),* 500–519.

Han, H., & Ryu, K. (2007). Moderating role of personal characteristics in forming restaurant customers' behavioral intentions: an upscale restaurant setting. *Journal of Hospitality & Leisure Marketing, 15(4),* 25-54.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R.E., & Tatham, R. L. (2010). *Multivariate Data Analysis a Global Perspective* (sixth ed.). New Jersey: Pearson Prentice Hall.

Hair, J. F. J., Bush, R. P. & Ortinau, D. J. (2000). *Marketing Research: A practical approach for the new millennium.* Singapore: McGraw-Hill.

Hapsari, R., Clemes, M. D., & Dean, D. L. (2014). *The Role of Customer Engagement in Enhancing Passenger Loyalty in the Indonesia Airline Industry.* Creating Innovation in Business Transformation - APMBA Conference Proceedings (P. 134-142). Malang, Indonesia.

Hardesty, D. M., & Bearden, W. O. (2004). The use of expert judges in scale development: Implications for improving face validity of measures of unobservable constructs. *Journal of Business Research, 57(2),* 98-107.

Hardy, M. & Bryman, A. (2004). *Handbook of data analysis.* London: Sage Publications.

Harrison-Walker, L. J. (2000). Service quality in the hair salon industry. *Journal of Business Discipline, 1,* 37 - 52.

Hart, A. E., & Rosenberger, P. J. (2004). The effect of corporate image in the formation of customer loyalty: An Australian replication. *Australasian Marketing Journal, 12(3),* 88-96.

Hartline, M. D. & Ferrell, O. C. (1996). The management of customer contact service employees: An empirical investigation. *Journal of Marketing, 69(10),* 52.

Harvey, L. & Green, D. (1993). Defining quality. *Assessment and Evaluation in Higher Education, 18(1),* 9-34.

Hashim, N. A. B., Abdullateef, A. O., & Sarkindaji, B. D. (2015). The Moderating Influence of Trust on the Relationship between Institutional Image/Reputation, Perceived Value on Student Loyalty in Higher Education Institution. *International Review of Management and Marketing, 5(3),* 122-128.

Hausman, A., 2003. Professional service relationships: a multi-context study of factors impacting satisfaction, re- patronization, and recommendations. *The Journal of Service Marketing 17 (2/3),* 226–242.

Helgesen, Ø. (2006). Are Loyal Customers Profitable? Customer Satisfaction, Customer (Action) Loyalty and Customer Profitability at the Individual Level. *Journal of Marketing Management, 22,* 245–266.

Helgesen, Ø. (2008). Marketing for Higher Education: A Relationship Marketing Approach. *Journal of Marketing for Higher Education, 18(1),* 50-78.

Helgesen, Ø., & Nesset, E. (2007a). Images, Satisfaction and Antecedents: Drivers of Student Loyalty? A Case Study of a Norwegian University College. *Corporate Reputation Review, 10,* 38 – 59.

Helgesen, Ø., & Nesset, E. (2007b). What accounts for students' loyalty? Some field study evidence. *International Journal of Educational Management, 21(2),* 126–143.

Hennig-Thurau, T., Langer, M.F., & Hansen, U. (2001). Modeling and managing student loyalty: An approach based on the concepts of relationship quality. *Journal of Service Research, 3(4),* 331–344.

Hernandez, K., Hogan, S., Hathaway, C., & Lovell, C. D. (1999). Analysis of the literature on the impact of student involvement on student development and learning: More questions than answers? *NASPA Journal, 36,* 184-197.

Hill, F. (1995). Managing service quality in higher education: The role of the student as –primary consumer. *Quality Assurance in Education, 3(3),* 1-21.

Hinton, P., Brownlow, C., & McMurray, I. (2004). *SPSS explained.* East Sussex: Routledge.

Ho, L. -A., Kuo, T., -H., & Lin, B. (2012). The mediating effect of website quality on Internet searching behaviour. *Computers in Human Behavior, 28(3),* 840–848.

Ho, S. K., & Wearn, K. (1995). A TQM model for higher education and training. *Training for Quality, 3(2),* 25-33.

Hossain, M. A., Dwivedi, Y. K., & Naseem, S. B. (2015). Developing and validating a hierarchical model of service quality of retail banks. *Total Quality Management & Business Excellence, 26(5-6),* 534-549.

Howat, G., & Assaker, G. (2013). The hierarchical effects of perceived quality on perceived value, satisfaction, and loyalty: Empirical results from public, outdoor aquatic centres in Australia. *Sport Management Review, 16(3),* 268-284.

Hu, Y. L., Ching, G. S., & Chao, P. C. (2012). Taiwan student engagement model: Conceptual framework and overview of psychometric properties. *International Journal of Research Studies in Education, 1(1),* 69-90.

Hu, H. –H., Kandampully, J., & Juwaheer, T. D. (2009). Relationships and impacts of service quality, perceived value, customer satisfaction, and image: an empirical study. *The Service Industries Journal, 29(2),* 111-125,

Huang, Y. R., & Chang, S. M. (2004). Academic and Cocurricular Involvement: Their Relationship and the Best Combinations for Student Growth False. *Journal of College Student Development, 45(4),* 391-406.

Huddleston, T. Jr., & Karr, M. (1982). Assessing college image. *College and University, 57(4),* 364-370.

Humbert, A. L., & Drew, E. (2010). Gender, entrepreneurship and motivational factors in an Irish context. *International Journal of Gender and Entrepreneurship, 2(2),* 173-196.

Huang, Y. -R., & Chang, S. -M. (2004). Academic and Cocurricular Involvement: Their Relationship and the Best Combinations for Student. *Journal of College Student Development, 45(4),* 391.

Hunt, K. H. (1977). *CS/D – Overview and Future Directions.* In Hunt, K. H. (Ed.), *Conceptualization and Measurement of Consumer Satisfaction and Dissatisfaction.* Cambridge, MA: Marketing Science Institute.

Ibrahima, M. Z., Rahmanb, M. N. A., & Yasinc, R. M. (2012). Assessing Students Perceptions of Service Quality in Technical Educational and Vocational Training (TEVT) Institution in Malaysia. *Procedia - Social and Behavioral Sciences, 56*, 272 – 283.

Ivy, J. (2001).Higher education institution image: A correspondence analysis approach. *The International Journal of Educational Management, 15(6/7),* 276-282.

Jain, S. K., & Gupta, G. (2004). Measuring service quality: SERVQUAL vs. SERVPERF scales. *The Journal fro Decision Makers, 29(2),* 25-37.

Jain, G., Sinha, G., & De, S. K. (2010). Service quality in higher education: an exploratory study. *Asia Journal of Marketing, 4(3),* 144-154.

Jain, R., Sinha, G., & Sahney, S. (2011). Conceptualizing service quality in higher education. *Asian Journal on Quality, 12(3),* 296-314.

Janssens, W., De Pelsmacker, P., Wijnen, K., & Van Kenhove, P. (2008). *Marketing research with SPSS.* New York: Pearson Education.

Jiewanto, A., Caroline, L., & Liza, N. (2012). Influence of Service Quality, University Image, and Student Satisfaction toward WOM Intention: A Case Study on Universitas Pelita Harapan Surabaya. *Procedia – Social and Behavioral Sciences, 40,* 16-23.

Johnes, J. (2006). Measuring teaching efficiency in higher education: An application of data envelopment analysis to economics graduates from UK Universities1993. *European Journal of Operational Research, 174,* 443- 456.

Johnson, M. D. & Fornell, C. (1991). A framework for comparing customer satisfaction across individuals and product categories. *Journal of Economic Psychology, 12(2),* 267.

Johnson, M. D., Gustafsson, A., Andreassen, T. W., Lervik, L., & Cha, J. (2001). The evolution and future of national customer satisfaction index models. *Journal of economic Psychology, 22(2),* 217-245.

Jöreskog, K. G. & Sörbom, D. (1993). *LISREL 8: Structural equation modeling with the SIMPLIS command language.* Lawrence Erlbaum Associates, Hillsdale, NJ.

Joseph, M., Yakhou, M., & Stone, G. (2005). An educational institution's quest for service quality: customers' perspective. *Quality Assurance in Education, 13(1),* 66-82.

Kaiser, H. F., & Rice, J. (1974). *Educational and psychological measurement* (Vol. 34). Little Jiffy: Mark IV.

Kandampully, J., & Hu, H. (2007). Do hoteliers need to manage image to retain loyal customers? *International Journal of Contemporary Hospitality Management, 19(6),* 435-443.

Kandampully, J., Juwaheer, T. D., & Hu, H. –H. (2011). The influence of a hotel firm's quality of service and image and its effect on tourism customer loyalty. International *Journal of Hospitality & Tourism Administration, 12(1),* 21-42.

Kandampully, J. A., Mok, C., & Sparks, B. (2001). *Servcie quality management in hospitality, tourism and leisure.* New York: Haworth Hospitality Press.

Kandampully, J., & Suhartanto, D. (2003). The role of customer satisfaction and image in gaining customer loyalty in the hotel industry. Journal of Hospitality & Leisure Marketing, 10(1-2), 3-25.

Kang, G. D. (2006). The hierarchical structure of service quality: Integration of technical and functional quality. *Managing Service Quality*, *16(1),* 37.

Kang, G., & James, J. (2004). Service quality dimensions: An examination of Gronroos's service quality model. *Managing Service Quality*, *14(4),* 266-277.

Kassim, N. M., & Souiden, N. (2007). Customer retention measurement in the UAE banking sector. *Journal of Financial Services Marketing, 11(3),* 217-228.

Kazoleas, D., Kim, Y., & Moffit, M. (2001). Institutional image: a case study. *Corporate Communications, 6(4),* 205-216.

Keedy, J. L., & Drmacich, D. (1991). *Giving voice and empowerment to student engagement: A school-based interactive curriculum.* Retrieved April 23, 2014, from http://www.eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=ED356516

Kelloway, E. K. (1998). *Using LISREL for structural equation modeling: A researcher's guide.* Thousand Oaks: Sage.

Kennedy, S. (1977). Nurturing corporate images. *European Journal of Marketing, 11(3),* 120-164.

Kennedy, S.H. (1997). Nurturing institutional image. *European Journal of Marketing, 11(3),* 120-164.

Kettinger, W. J., & Lee, C. C. (1994). Perceived service quality and user satisfaction with the information services function. *Decision Sciences, 25(5),* 737 - 766.

Kheiry, B., Rad, B. M., & Asgari, O. (2012). University intellectual image impact on satisfaction and loyalty of students (Tehran selected universities). *African Journal of Business Management, 6 (37),* 10205-10211.

Kim, H., & Kim, W. (2005). The relationship between brand equity and firms' performance in luxury hotels and chain restaurants. *Tourism Management, 26(4),* 569-588.

Kim, M. K., Park, M. C., & Jeong, D. H. (2004). The effects of customer satisfaction and switching barrier on customer loyalty in Korean mobile telecommunication services. *Telecommunication Policy*, *28(2),* 145-159.

Kim, J., Suh, E., & Hwang, H. (2003). A model of evaluating the effectiveness of CRM using the balanced scorecard. *Journal of Interactive Marketing, 17(2),* 5-19.

Kline, R. B. (2005). Principles *and practice of structural equation modeling* (2nd edition ed.): Guilford press.

Kline, R. B. (2011). *Principles and practice of structural equation modeling*: Guilford press.

Koni, A., Zainal, K., & Ibrahim, M., (2013). An assessment of the services quality of Palestine higher education. *International Education Studies, 6(2),* 33-48.

Kotler, P., & Fox, K. (1995). *Strategic Marketing for Educational Institutions,* 2nd ed, Prentice-Hall, Englewood Cliffs, NJ.

Ko, Y. J., & Pastore, D. L. (2005). A Hierarchial Model of Service Quality for the Recreational Sport Industry. *Sport Marketing Quarterly, 14(2),* 84-97.

Krause, K. L., & Coates, H. (2008). Students' engagement in first year university. *Assessment & Evaluation in Higher Education, 33(5),* 493-505.

Krishnaveni, R. & Deepa, R. (2013). Controlling Common Method Variance while Measuring the Impact of Emotional Intelligence on Well-being. *Vikalpa, 38(1),* 41 – 48.

Kristensen, K., Martensen, A., & Grønholt, L. (1999). Measuring the impact of buying behaviour on customer satisfaction. *Total Quality Management, 10(4-5),* 602- 614.

Krueger, R. A., & Casey, M. A. (2000). *Focus Group: A Practical Guide for Applied Research.* Thousand Oaks, CA: Sage.

Kuh, G. D. (2001). *The national survey of student engagement: Conceptual framework and overview of psychometric properties.* Bloomington, IN: Indiana University Center for Postsecondary Research and Planning.

Kuh, G. D. (2009). The national survey of student engagement: Conceptual and empirical foundations. *New Directions for Institutional Research, 141,* 5-21.

Kuh, G. D., Cruce, T., Shoup, R., Kinzie, J., & Gonyea, R. (2008). Unmasking the effects of student engagement on first-year college grades and persistence. *The Journal of Higher Education, 79(5),* 540–563.

Kuh, G. D., Pace, C. R., & Vesper, N. (1997). The development of process indicators to estimate student gains associated with good practices in undergraduate education. *Research in Higher Education, 38(4),* 435-454.

Kumar, V., Aaker, D. A., & Day, G. S. (1999). *Essentials of marketing research.* New York: John Wiley & Sons, Inc.

Kuo, N. –T., Chang, K. –C., Cheng, Y. –S., & Lai, C. –H. (2013). How service quality affects customer loyalty in the travel agency: The effects of customer satisfaction, service recovery, and perceived value. *Asia Pacific Journal of Tourism Research, 18(7),* 803-822.

Kuo, Y-K., & Ye, K-D. (2009). The causal relationship between service quality, corporate image and adults'learning satisfaction and loyalty: A study of professional training programmes in a Taiwanese vocational institute. *Total Quality Management & Business Excellence, 20*(7), 749-762.

Kwan, P. Y. K., & Ng, P. W. K. (1999). Quality indicators in higher education – comparing Hong Kong and China's students. *Managerial Auditing Journal, 14(1/2),* 20-27.

Kwun, D. J. –W. (2011). Effects of campus foodservice attributes on perceived value, satisfaction, and consumer attitude: A gender-difference approach. International *Journal of Hospitality Management, 30(2),* 252-261.

Kyle, G. T., Theodorakis, N. D., Karageorgiou, A., & Lafazani, M. (2010). The effect of service quality on customer loyalty within the context of ski resorts. *Journal of Park & Recreation Administration, 28(1),* 1-15.

Ladhari, R. (2008) Alternative measures of service quality: a review. *Managing Service Quality, 18(1),* 65-86.

Lai, F., Griffin, M., & Babin, B. J. (2009). How quality, value, image, and satisfaction create loyalty at a Chinese telecom. *Journal of Business Research, 62(10),* 980-986.

Lai, H-H., & Huang, T-M. (2009) Characteristics of the Higher Education in Mainland China and Taiwan. *The International Journal of Organizational Innovation, 2(2),* 307-320.

Lam, S. Y., Shankar, V., Erramilli, M. K., & Murthy, B. (2004). Customer value, satisfaction, loyalty, and switching costs: an illustration from a business-to-business service context. *Journal of the Academy of Marketing Science, 32(3),* 293-311.

Lagrosen, S., Seyyed-Hashemi, R., & Leitner, M. (2004). Examination of the dimensions of quality in higher education. *Quality Assurance in Education, 12(2),* 61-69.

Lam, S. K. (1997). SERVQUAL: A tool for measuring patients' opinions of hospital service quality in Hong Kong. *Total Quality Management, 8(4),* 145 - 152.

Larose, D. T. (2006). *Data mining methods and models.* New Jersey, NJ: John Wiley & Sons.

Lawrence, S. M., Gamst, G., & Guarino, A. J. (2013). *Applied Multivariate Research Design and Interpretation* (Vol. 2). California: SAGE Publications, Inc.

LeBlanc, G., & Nguyen, N. (1997). Searching for excellence in business education: An exploratory study of customer impressions of service quality. *International Journal of Educational Management, 11(2),* 72-79.

Leary, M. R. (2004). *Introduction to behavioral research methods* (4th ed.). Boston: Pearson.

Lee, H., Lee, Y., & Yoo, D. (2000). The determinants of perceived service quality and its relationship with satisfaction. *Journal of Services Marketing, 14(3),* 217-231.

Lee, K. E., Shanklin, C. W., & Dallas, E. J. (2003). Development of service quality measurement for foodservice in continuing care retirement communities. Foodservice Research International, 14(1), 1-21.

Letcher, D. W., & Neves, J. S. (2010). Determinants of undergraduate business student satisfaction. *Research in Higher Education Journal, 6(1),* 1-26.

Li, T., Berens, G., & de Maertelaere, M. (2013). Corporate Twitter Channels: The Impact of Engagement and Informedness on Corporate Reputation. *International Journal of Electronic Commerce, 18(2),* 97-126.

Li, S., Whalley, J., & Xing, C. B. (2014). China's higher education expansion and unemployment of college graduates. China Economic Review, 30, 567-582.

Li, Y. A., Whalley, J., Zhang, S. M., & Zhao, X. L. (2011). The higher educational transformation of China and its global implications. *The World Economy, 34(4),* 516-545.

Lin, C-P., & Tsai, Y.H. (2006). Modeling educational quality and student loyalty: A quantitative approach based on the theory of information cascades*. Quality and Quantity, 42,* 397–415.

Lin, H. H., & Wang, Y. S. (2006). An examination of the determints of customer loyalty in mobile commerce contexts. *Information and Management, 43,* 271-282.

Ling, K. C., Chai, L. T., & Piew, T. H. (2010). The 'inside-out' and 'outside-in' approach on students' perceived service quality: an empirical evaluation. *Management Science and Engineering, 4(2),* 1-26.

Linder, R. L., Murphy, T. H., & Briers, G. E. (2001). *The handling nonresponse in agricultural education.* Papers presented at the 28th Annual National Agricultural Education Research Conference (p. 233 – 245).

Litwin, M. S. (1995). *The Survey Kit*: *How to measure survey reliability and validity.* Thousand Oaks: CA: SAGE Publications, Inc.

Lovelock, C. H. (1981). *Why marketing management needs to be different for services.* In J.H. Donnelly & W. R. George (Eds.), Marketing of Services. Chicago, IL: American Marketing Association.

Lu, Y., Zhang, L., & Wang, B. (2009). A multidimensional and hierarchical model for mobile service quality. *Electronic Commerce Research and Applications, 8(5),* 228-240.

Lupo, T. (2013). A fuzzy ServQual based method for reliable measurements of education quality in Italian higher education area. *Expert Systems with Applications, 40,* 7096–7110.

MacKinnon, D. P., & Fairchild, A. J. (2009). Current directions in mediation analysis. *Current Directions in Psychology,* 18, 16−20.

MacMillan, K., Money, K., Downing, S., & Hillenbrand, C. (2005). Reputation in relationships: measuring experiences, emotions and behaviors. *Corporate Reputation Review, 8(2),* 214-232.

Mai, L. (2005). A comparative study between UK and US: the student satisfaction in higher education and its influential factors. *Journal of Marketing Management, 21(7),* 859-878.

Mangold, W. G., & Babakus, E. (1991). Service quality: The front-stage vs. the back-stage perspective. *Journal of Services Marketing, 5(4),* 59-70.

Mansor, A. A., Hasanordin, R., Rashid, M. H. A., & Rashid, W. E. W. (2012). Hierarchical Service Quality Model towards Student Satisfaction. *International Journal of Innovation, Management and Technology, 3(6),* 803-807.

Martin, A. J., & Dowson, M. (2009). Interpersonal relationships, motivation, engagement, and achievement: Yields for theory, current issues, and educational practice. *Review of Educational Research, 79(1),* 327-365.

Martínez Caro, L., & Martínez García, J. A. (2007). Measuring perceived service quality in urgent transport service. *Journal of Retailing and Consumer Services, 14(1),* 60-72.

Martínez Caro, L., & Martínez García, J. A. (2008). Developing a multidimensional and hierarchical service quality model for the travel agency industry. *Tourism Management, 29(4),* 706-720.

Martínez, P., Pérez, A., & del Bosque, I. R. (2014). CSR influence on hotel brand image and loyalty. *Academia, 27(2),* 267-283.

Marzo-Navarro, M., Pedraja-Iglesias, M., & Rivera-Torres, M. P. (2005). Measuring customer satisfaction in summer courses. *Quality Assurance in Education, 13(1),*53-65.

Mattila, A. S. (2000). The impact of culture and gender on customer evaluations of service encounters. *Journal of Hospitality & Tourism Research, 24(2),* 263-273.

Mavondo, F. Y., Tsarenko, Y., & Gabbott, M. (2004). International and Local Student Satisfaction: Resources and Capabilities. *Journal of Marketing for Higher Education, 14(1),* 41-60.

Mazursky, D., & Jacoby, J. (1986). Exploring the development of store image. *Journal of Retailing, 62(2),* 145-165.

McAlexander, J.H., Kaldenberg, D.O., & Koenig, H.F. (1994). Service quality measurement. *Journal of Health care Marketing, 14(3),* 34-40.

McDaniel, C. D. & Gates, R. H. (1998). *Marketing research essentials.* Ohio: South-Western College Publishing.

McDougall, G. H. G. & Levesque, T. J. (1994). A revised view of service quality dimensions: An empirical investigation. *Journal of Professional Service Marketing*, *11(1),* 189.

Meng, F., & Uysal, M. (2008). Effects of Gender Differences on Perceptions of Destination Attributes, Motivations and travel Values: An Examination Of a Nature-based Resort Destination. *Journal of Sustainable Tourism, 16(4),* 445-466.

Meyers, L. S., Gamst, G., & Guarino, A. J. (2013). *Applied Multivariate Research* (2nd edition ed.). United Sates of America: SAGE Publication, Inc.

Minami, C., Dawson, J. (2008). The CRM process in retail and service sector firms in Japan: Loyalty development and financial return. *Journal of Retailing and Consumer Services, 15,* 375-385.

Ministry of Education of the People's Republic of China (1985). *Decision of the central committee of Chinese communist party on reform of the education system.* Available at: www.moe.edu.cn/publicfiles/business/htmlfiles/moe/moe_177/200407/2482.html (in Chinese).

Ministry of Education of the People's Republic of China (1993). *The outline for educational reform and development in China.* Available at: www.moe.edu.cn/publicfiles/business/htmlfiles/moe/moe_177/200407/2484.html (in Chinese).

Ministry of Education of the People's Republic of China (2009). *Higher education law of the People's Republic of China.* Available at: www.moe.gov.cn/publicfiles/business/htmlfiles/moe/moe_2803/200905/48454.html (in Chinese).

Ministry of Education of the People's Republic of China (2014). *Total number of student enrolments in higher education institutions in China from year 2000 to 2013.*Available at: www.moe.edu.cn (in Chinese)

Ministry of Education of the People's Republic of China (2014). *Number of higher education Institutions, Gross enrolment rate, Total number of students enrolments in regular college and university, Number of graduate students, Average number of full-time students in four-year universities and colleges, Number of teachers and administrative staff in regular colleges and universities, Total floor space of buildings in regular colleges and universities, Value of equipment and apparatus for teaching and research.* Available at: www.moe.edu.cn (in Chinese)

Mittal, S., Gera, R., & Singhvi, S. R. (2013). Developing and testing a hierarchical model of customer perceived service quality for life insurance services. *Asia-Pacific Journal of Management Research and Innovation, 9(1),* 63-76.

Mittal, V., & Kamakura, W. A. (2001). Satisfaction, repurchase intent, and repurchase behavior: investigating the moderating effect of customer characteristics. *Journal of Marketing Research, 38(1),* 131-142.

Mok, K. H. (2000). Marketizing higher education in post-Mao China. *International Journal of Educational Development, 20(2),* 109-126.

Mohamad Yusof, A. R., Hassan, Z., Abdul Rah man, S., & Ghouri, A. M. (2012). Educational service quality at public higher educational institutions: A proposed framework and importance of the sub – dimensions. *International Journal of Economics Business and Management Studies, 1(2),* 36-49.

Moore, J., Lovell, C. D., McGann, T., & Wyrick, J. (1998). Why involvement matters: A review of research on student involvement in the collegiate setting. *College Student Affairs Journal, 17(2),* 4-17.

Moore, J.C. (2009). A Synthesis of Sloan-C Effective Practices: December 2009. *Journal of Asynchronous Learning Networks, 13(4),* 73-97.

Morgan, G. A. & Griego, O. V. (1998). *Easy use and interpretation of SPSS for Windows: Answering research questions with statistics.* New Jersey, NJ: Lawrence Erlbaum Associates.

Mosadeghrad, A. M. (2014). Factors Influencing Healthcare Service Quality. International *Journal of Health Policy and Management, 3(2),* 77-89.

Mostafa, M. M. (2007). A Comparison of SERVQUAL and I-P Analysis: Measuring and Improving Service Quality in Egyptian Private Universities. *Journal of Marketing for Higher Education, 16,* 83–104.

Mueller, R. O. (1996). *Basic principles of structural equation modeling: An introduction to LISREL and EQS.* New York: Springer.

Nesset, E., & Helgesen, Ø. (2009). Modelling and managing student loyalty: a study of a Norwegian university college. *Scandinavian Journal of Educational Research, 53(4),* 327-345.

Nguyen, N., & LeBlanc, G. (1998). The mediating role of corporate image on customers' retention decisions: an investigation in financial services. *The International Journal of Bank Marketing, 16(2),* 52-65.

Nguyen, N., & LeBlanc, G. (2001). Image and reputation of higher education institutions in students' retention decisions*. International Journal of Educational Management, 15(6),* 303–311.

Nguyen, N., & Leclerc, A. (2011). The effect of service employees' competence on financial institutions' image: benevolence as a moderator variable. *Journal of Service Marketing, 25(5),* 349-360.

Nokelainen, P. (2009). *Structural equation modeling with Amos.* Retrieved from http://www.uta.fi/aktkk/lectures/sem_en/pdf/2009_nokelainen_sem_exercise.pdf

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill.

Nunnally, J. C., & Bernstein, I. (1994). *Psychometric Theory*. New York: NY: McGraw-Hill.

Odin, Y., Odin, N. & Valette-Florence, P. (2001). Conceptual and operational aspects of brand loyalty: An empirical investigation. *Journal of Business Research, 53(2),* 75-84.

Oh, H. C. (1998). An empirical study of the relationship between restaurant images and patronage behavior toward alternative restaurant chains. *Asia Pacific Journal of Tourism Research, 2(2),* 15-28.

Oh, H., Parks, S. C., & Demicco, F. J. (2002). Age- and gender-based market segmentation: A structural understanding. *International Journal of Hospitality & Tourism Administration, 3(1),* 1-20.

Oliver, R. L. (1980). A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of Marketing Research, 17,* 460-469.

Oliver, R. L. (1993). A conceptual model of service quality and service satisfaction: Compatible goals, different concepts. In T. A., Swartz, D. E., Bowen, & S. W. Brown (Eds.), *Advances in services marketing and management: Research and practice* (pp. 65-85). Greenwich, CT: JAI Press.

Oliver, R. L. (1997). *Satisfaction: A behavioural perspective on the consumer.* New York: Irwin/McGraw-Hill.

Oliver, R. L. (1999). Whence Consumer Loyalty? *Journal of Marketing, 63(4),* 33-44.

Oliver, R.L. (2010). *Satisfaction: a behavioural perspective on the consumer*, 2nd ed. M.E. Sharpe, Inc., New York.

Oliver, R. L., & DeSarbo, W. S. (1989). Processing of the satisfaction response in consumption: a suggested framework and research proposition. *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior, 2,* 1–16.

Oliver, R. L. & Linda, G. (1981). Effects on satisfaction and its antecedents on consumer preferences and intention. *Advances in Consumer Research, 8,* 88.

Oliveira, O., & Ferreira, E. (2009). Adaptation and application of the SERVQUAL scale in higher education. *Paper presented at the 20th Annual Conference of the Production and Operations Management Society (POM), Orlando, Florida.* Available at: https://www.pomsmeetings.org

Olorunniwo, F., Hsu, M. K., & Udo, G. J. (2006). Service quality, customer satisfaction, and behavioral intentions in the service factory. *Journal of Services Marketing, 20(1),* 59-72.

Osborne, J. W. & Costello, A. B. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research & Evaluation, 10(7),* 1.

Osman, Z., & Sentosa, I. (2013). Mediating Effect of Customer Satisfaction on Service Quality and Customer Loyalty Relationship in Malaysian Rural Tourism. International *Journal of Economics Business and Management Studies, 2(1),* 25-37.

Ostrowski, P. L., O'Brien, T. V., & Gordon, G. L. (1993). Service quality and customer loyalty in the commercial airline industry. *Journal of Travel Research, 32(2),* 16-24.

Outcalt, C. L., & Skewes - Cox, T. E. (2002). Involvement, interaction, and satisfaction: The human environment at HBCUs. *The Review of Higher Education, 25,* 331-347.

Palacio, A., Meneses, G., & Pérez, P. (2002). The configuration of the university image and its relationship with the satisfaction of students. *Journal of Educational Administration, 40(5),* 486-505.

Pallant, J. (2010). *SPSS survival manual: A step by step guide to data analysis using SPSS*: Open University Press.

Pampaloni, A. M. (2010). The influence of organizational image on college selection: what students seek in institutions of higher education. *Journal of Marketing for HigherEducation, 20(1),* 19-48.

Parasuraman, A., Zeithaml, V. A. & Berry, L. L. (1985). A conceptual model of service quality and its implications for future research. *Journal of Marketing, 49(4),*41.

Parasuraman, A., Zeithaml, V. A. & Berry, L, L. (1988). SERVQUAL: A multiple151 item scale for measuring consumer perceptions of service quality. *Journal of Marketing, 64(1),*12.

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1991). Refinement and reassessment of the SERVQUAL scale. Journal of Retailing, 67(4), 420-450.

Parasuraman, A., Zeithaml, V. A. & Berry, L. L. (1994). Reassessment of expectations as a comparison standard in measuring service quality: implications for further research. *Journal of Marketing, 58(1),* 111.

Parayitam, S., Desai, K., & Phelps, L. D. (2007). The Effect of Teacher Communication and Course Content on Student Satisfaction and Effectiveness. *Academy of Educational Leadership Journal, 11(3),* 91-105.

Park, J. W., Robertson, R., & Wu, C. L. (2004). The effect of airline service quality on passengers' behavioural intentions: a Korean case study. *Journal of Air Transport Management, 10(6),* 435-439.

Park, J. W., Robertson, R., & Wu, C. L. (2006). Modelling the impact of airline service quality and marketing variables on passengers' future behavioural intentions. *Transportation Planning and Technology, 29(5),* 359-381.

Pascarella, E. T., & Terenzini, P. T.(1991). *How college affects students: Findings and insights from twenty years of research.* San Francisco: Jossey – Bass.

Palacio, A. B., Meneses, G. D., & Perez, P. J. P. (2002). The configuration of the university image and its relationship with the satisfaction of students. *Journal of Educational Administration, 40(4/5),* 486-505.

Patterson, P. G., Johnson, L. W., & Spreng, R. A. (1997). Modeling the determinants of customer satisfaction for business-to-business professional services*. Journal of Academy of the Marketing Science, Winter,* 4–17.

Payne, A., & Rickard, J. (1997). *Relationship marketing, customer retention and firm profitability.* Working paper, Cranfield School of Management, Bedford.

Peng, C. (2008). Chinese adolescent student service quality and experience in an international tertiary education system. *Adolescence, 43(171),* 661-680.

Peng, X. S. & Lai, F. J. (2012). Using partial least squares in operations management research: A practical guideline and summary of past research. *Journal of Operations Management,* 30, 467–480.

Perin, M. G., Sampaio, C. H., Simões, C., & De Pólvora, R. P. (2012). Modeling antecedents of student loyalty in higher education. *Journal of Marketing for Higher Education, 22(1),* 101-116.

Pitt, L. F., Watson, R. T., & Kavan, C. B. (1995). Service quality: a measure of information systems effectiveness. *MIS Quarterly, 19(2),* 173 - 188.

Pollack, B. L. (2009). Linking the hierarchical service quality model to customer satisfaction and loyalty. *Journal of Service Marketing, 23(1),* 42-50.

Powpaka, S. (1996). The role of outcome quality as a determinant of overall service quality in different categories of services industries: and empirical investigation. *Journal of Services Marketing, 10(2),* 5-25.

Qin, H., & Prybutok, V. R. (2008). Determinants of customer perceived service quality in fast food restaurants and their relationship to customer satisfaction and behavioural intentions. *Quality Management Journal, 15(2),* 35-50.

Rahman, S., Haque, A., & Ahmad, M. I. S. (2010). Exploring influencing factors for the selection of mobile phone service providers: A structural equational modeling (SEM) approach on Malaysian consumers. *African Journal of Business Management, 4(13),* 2885-2898.

Rajab, A., Panatik, S. A., Rahman, A., Rahman, H. A., Shaari, R. & Saat, M. (2011). Service Quality in a Research University: A Post-Graduate Perspective. *Procedia - Social and Behavioral Sciences, 29,* 1830 – 1838.

Ram, S., & Jung, H. S. (1991). How product usage influences customer satisfaction. *Marketing Letters, 2(4),* 403-411.

Ravindran, S. D., & Kalpana, M. (2012). Student's Expectation, Perception and Satisfaction towards the Management Educational Institutions. *Procedia Economics and Finance, 2,* 401-410.

Ravichandran, K., Tamil Mani, B., Arun Kumar, S., & Prabhakaran, S. (2010). Influence of service quality on customer satisfaction: application of SERVQUAL model. *International Journal of Business and Management, 5(4),* 117 - 124.

Reynolds, N. L., Simintiras, A. C., & Diamantopoulos, A. (2003). Theoretical justification of sampling choices in international marketing research: Key issues and guidelines for researchers. *Journal of International Business Studies, 34(1),* 80-89.

Richard, M. D., & Allaway, A. W. (1993). Service quality attributes and choice behaviour. *Journal of Services Marketing, 7(1),* 59-68.

Ridgeway, C. L., & Correll, S. J. (2004). Unpacking the gender system a theoretical perspective on gender beliefs and social relations. *Gender & Society, 18(4),* 510-531.

Riley, M., Wood, R., Clark, M., Wilkie, E., & Szivas, E. (2000). *Researching and writing dissertations in business and management.* London: Thomson Learning.

Rindova, V. P., & Fombrun, C. J. (1999). Constructing competitive advantage: the role of firm-constituent interactions. *Strategic Management Journal, 20,* 691-710.

Rodie, A.R. and Kleine, S.S. (2000). Customer participation in services production and delivery. In Swartz, T.A. and Iacobucci, D. (Eds), *Handbook of Service Marketing and Management, Sage, Thousand Oaks, CA*, 111-25.

Rojas-Méndez, J., Vasquez-Parraga, A. Z., Kara, A., & Cerda-Urrutia, A. (2009). Determinants of Student Loyalty in Higher Education: A Tested Relationship Approach in Latin America. *Latin American Business Review, 10(1),* 21-39.

Rust, R. T., & Oliver, R. L. (1994). *Service quality: New directions in theory and practice.* Sage Publications California.

Russell, M. (2005). Marketing education: A review of service quality perceptions among international students. *International Journal of Contemporary Hospitality Management, 17(1),* 65-77.

Ryu, K., & Han, H. (2010). Influence of the quality of food, service, and physical environment on customer satisfaction in quick-casual restaurants: moderating role of perceived price. *Journal of Hospitality & Tourism Research, 34(3),* 310-329.

Ryu, K., Han, H., & Kim, T. H. (2008). The relationships among overall quick-casual restaurant image, perceived value, customer satisfaction, and behavioral intentions. *International Journal of Hospitality Management, 27(3),* 459-469.

Saha, G. C., & Theingi. (2009). Service quality, satisfaction, and behavioural intentions: a study of low-cost airline carriers in Thailand. *Managing Service Quality: An International Journal, 19(3),* 350-372.

Sahney, S., Banwet, D. K., & Karunes, S. (2004). A SERVQUAL and QFD approach to total quality education: A student perspective. *International Journal of Productivity and Performance Management, 53(1/2),* 143–166.

Schall, M. (2003). Best practices in the assessment of hotel-guest attitudes: for guest surveys to provide useful information, those surveys must be properly designed. *Cornell Hotel and Restaurant Administration Quarterly, 44(2),* 51-65.

Schertzer, C. B., & Schertzer, S. M. B. (2004).Student Satisfaction and Retention: A Conceptual Model. *Journal of Marketing for Higher Education, 14(1),* 79-91.

Schlesinger, W., Cervera, A., & Iniesta, M. Á. (2015) Key Elements in Building Relationships in the Higher Education Services Context. *Journal of Promotion Management, 21(4),* 475-491.

Schumacker, R. E., & Lomax, R. G. (2004). *A beginner's guide to strutural equation modeling.* Mahwah: NJ: Lawrence Erlbaum Associates.

Selnes, F. (1993). An examination of the effect of product performance on brand reputation, satisfaction and loyalty. *European Journal of Marketing, 27(9),* 19-35.

Sevier, R. (1994). Image is everything. *College and University, Winter,* 60-75.

Sevier, R. A. (1996). Those important things: what every college president needs to know about marketing and student recruiting. *College & University, Spring,* 9-16.

Seymour, D. T. (1993). *On Q: Causing quality in higher education.* Phoenix, AZ; Oryx.

Shanghai University. (2015). *Shanghai University Overview.* Retrieved from http://en.shu.edu.cn

Shanghai Normal University. (2015). *Shanghai Normal University Overview.* Retrieved from http://www.shnu.edu.cn

Sharkness, J., & DeAngelo, L. (2011). Measuring Student Involvement: A Comparison of Classical Test Theory and Item Response Theory in the Construction of Scales from Student Surveys. *Research in Higher Education, 52(5),* 480-507.

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods, 7(4),* 422−445.

Spreng, R. A. & Mackoy, R. D. (1996) An Empirical Examination of a Model of Perceived Service Quality and Satisfaction. *Journal of Retailing, 72(2)*, 201-214.

Sohail, M. S. & Shaikh, N. M. (2004). Quest for excellence in business education: A study of student impressions of service quality. *International Journal of Educational Management, 18(1)*, 58-65.

Sojkin, B., Bartkowiak, P. and Skuza, A. (2012). Determinants of higher education choices and student satisfaction: the case of Poland. *Higher Education, 63(5),* 565-81.

Solomon, M. R. (1994). *Consumer Behavior, 2nd ed.* Allyn & Bacon, London.

Standifird, S. S. (2005). Reputation among peer academic institutions: An investigation of the US News and World Report's rankings. *Corporate Reputation Review, 8(3),* 233-244.

Stewart, D. W. (1981). The application and misapplication of factor analysis in marketing research. *Journal of Marketing Research, 18(1),* 51-62.

Stewart, A. J., & McDermott, C. (2004). Gender in psychology. *Annu. Rev. Psychol., 55,* 519-544.

Suhartanto, D., Clemes, M., & Dean, D. (2013). Analyzing the Complex and Dynamic Nature of Brand Loyalty in the Hotel Industry. *Tourism Review International, 17(1),* 47-61.

Sultan, P., & Tarafder, T. (2007). A model for quality assessment in higher education: implications for ODL universities. *Malaysian Journal of Distance Education, 9(2),* 125-143.

Sultan, P., & Wong, H. (2010). Performance-based service quality model: An empirical study on Japanese universities. *Quality Assurance in Education, 18(2),* 126-143.

Sumaedi, S., Bakti, G. M. Y., & Metasari, N. (2011). The Effect of Students' Perceived Service Quality and Perceived Price on Student Satisfaction. *Management Science and Engineering, 5(1),* 88-97.

Sung, M., & Yang, S. (2008). Toward the model of university image: The influence of brand personality, external prestige, and reputation. *Journal of Public Relations Research, 20,* 357–376.

Sweeney, J. C., & Ingram. D. (2001). A Comparison of Traditional and Web-Based Tutorials in Marketing Education: An Exploratory Study. *Journal of Marketing Education, 23(1),* 55-62.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics* (Fifth edition ed.). Boston: Pearson Education Inc.

Tam, J. L. M. (2004). Customer satisfaction, service quality and perceived value: an integrative model. *Journal of Marketing Management, 20(7-8),* 897-917.

Tam, M. (2007). Assessing quality experience and learning outcomes Part II: Findings and discussion. *Quality Assurance in Education, 15(1),* 61-76.

Tanaka, J. S. (1993). *Multifaceted conceptions of fit in structural equation models.* In K. A. Bollen & J. S. Long (Eds.), Testing structural equation models (pg.10-39). Newbury Park, CA: Sage.

Tan, K. C., & Kek, S. W. (2004). Service quality in higher education using an enhanced SERVQUAL approach. *Quality in Higher Education, 10(1),* 17-24.

Teas. R. K. (1993). Expectation, performance evaluation, and consumers' perceptions of quality. *Journal of Marketing, 57(4),* 18.

Teeroovengadum, V., Kamalanabhan, T. J., & Seebaluck, A. K. (2016). Measuring service quality in higher education. *Quality Assurance in Education, 24(2),* 244 – 258.

Temizer, L., & Turkyilmaz, A. (2012). Implementation of Student Satisfaction Index Model in Higher Education Institutions. *Procedia - Social and Behavioral Sciences, 46,* 3802-3806.

Thébaud, S. (2010). Gender and Entrepreneurship as a Career Choice: Do Self-assessments of Ability Matter? *Social Psychology Quarterly, 73(3),* 288-304.

Tinto, V. (1993). *Leaving College: Rethinking the Causes and Cures of Student Attrition*. University of Chicago Press, Chicago, IL.

Tribe, J., & Snaith, T. (1998). From SERVQUAL to HOLSAT: holiday satisfaction in Varadero, Cuba. *Tourism Management, 19(1),* 25 - 34.

Türkyılmaz, A., & Özkan, C. (2007). Development of a customer satisfaction index model: An application to the Turkish mobile phone sector. *Industrial Management & Data Systems, 107(5),* 672-687.

Ueltschy, L. C., & Krampf, R. F. (2001). Cultural sensitivity to satisfaction and service quality measures. *Journal of Marketing Theory and Practice,* 14-31.

Ullman, J. B. (2006). Structural equation modeling: reviewing the basics and moving forward. *Journal of Personality Assessment, 87,* 35-50.

Van der Graaff, J., Branje, S., De Wied, M., Hawk, S., Van Lier, P., & Meeus, W. (2014). Perspective taking and empathic concern in adolescence: Gender differences in developmental changes. *Developmental psychology, 50(3),* 881.

Van Dyke, T. P., Kappelman, L. A., & Prybutok, V. R. (1997). Measuring information systems service quality: Concerns on the use of the SERVQUAL questionnaire. *MISQuarterly, 21(2),* 195-208.

Voss, R., Gruber, T., & Szmigin, I. (2007). Service quality in higher education: The role of student expectations. *Journal of Business Research, 60,* 949–959.

Walsh, G., Evanschitzky, H., & Wunderlich, M. (2008). Identification and analysis of moderator variables: investigating the customer satisfaction-loyalty link. *European Journal of Marketing, 42(9-10),* 977-1004.

Wang, C. -C., Chen, C. -T., & Chen, C. -F. (2012). Investigation on the influence of the brand image of higher educational institutions on satisfaction and customer lifetime value. *Educational Studies, 38(5),* 593-608.

Wei, C. C., & Ramalu, S. S. (2011). Students Satisfaction towards the University: Does Service Quality Matters? *International Journal of Education, 3(2),* 1-15.

Wilkins, S., & Balakrishnan, M. S. (2013). Assessing student satisfaction in transnational higher education. *International Journal of Educational Management, 27(2),* 143-156.

Willaby, H. W., Costa, D. S. J., Burns, B. D., MacCann, C., & Roberts, R. D. (2015). Testing complex models with small sample sizes: A historical overview and empirical demonstration of what Partial Least Squares (PLS) can offer differential psychology. *Personality and Individual Differences,* 84, 73–78.

Willimack, D. K., Schuman, H., Pennell, B. & Lepkowski, J. M. (1995). Effects of a prepaid nonmonetary incentive on response rates and response quality in a face-to- face survey. *Public Opinion Quarterly, 59(1),* 78.

World Population Review. (2016). *Shanghai Population 2016.* Retrieved from http://worldpopulationreview.com/world-cities/shanghai-population/

Wu, H., Tennyson, R. D., & Hsia, T. (2010). A Study of Student Satisfaction in a Blended ELearning System Environment. *Computers and Education, 55,* 155-164.

Wu, H. C., & Cheng, C. C. (2013). A hierarchical model of service quality in the airline industry. *Journal of Hospitality and Tourism Management, 20(0),* 13-22.

Wu, H. C., & Hsu, F. S. (2012). A Multi-Dimensional and Hierarchical Model of Service Quality in the Gaming Industry. *International Journal of Tourism Sciences, 12(3),* 90-118.

Wuensch, K. L., Azia, E. O., Kishore, M., & Tabrizi, M. H. N. (2008). Pedagogical Characteristics of Online and Face-to-Face Classes. *International Journal on E Learning, 7(3),* 523-532.

Yap, S. F., & Kew, M. L. (2006). Service quality and customer satisfaction: antecedents of customer's re-patronage intentions. *Sunway Academic Journal, 4,* 59-73.

Yeo, R. K. (2009). Service quality ideals in a competitive tertiary environment. International *Journal of Educational Research, 48,* 62–76.

Yin, D., & Lei, S. A. (2007). Impacts of Campus Involvement on Hospitality Student Achievement and Satisfaction. *Education, 28(2),* 282-293.

Yousapronpaiboon, K. (2014). SERVQUAL: Measuring higher education service quality in Thailand. *Procedia - Social and Behavioral Sciences, 116,* 1088 – 1095.

Yu, J., & Cooper, H. (1983). A quanatitative review of researh design effects on response rates to questionnaires. *Journal of Marketing Research, 20(1),* 36-44.

Yu, W., & Ramanathan, R. (2012). Retail service quality, corporate image and behavioural intentions: the mediating effects of customer satisfaction. The International Review of Retail, *Distribution and Consumer Research, 22(5),* 485-505.

Zeithaml, V. A, Berry, L. L, & Parasuraman, A. (1993). The nature and determinants of customer expectations of services. *J Acad Mark Sci, 21(1),* 1–12.

Zeithaml, V. A., Berry, L. L., & Parasuraman, A. (1996). The behavioural consequences of service quality. *Journal of Marketing*, *60(2),* 31-46.

Zeithaml, V. A., & Parasuraman, A. (2004). *Service Quality.* Cambridge, Mass: Marketing Science Institute.

Zha, Q. (2009). Diversification or homogenization: how governments and markets have combined to (re)shape Chinese higher education in its recent massification process. *Higher Education, 58(1),* 41-58.

Zhong, H. (2011). Returns to higher education in China: What is the role of college quality? China Economic Review, 22, 260–275.

Zhou, L. (2004). A dimension-specific analysis of performance-only measurement of service quality and satisfaction in China's retail banking. *The Journal of Service Marketing, 18(6/7),* 534-546.

Zikmund, W., Babin, B., Carr, J., & Griffin, M. (2012). *Business research methods*: Cengage Learning.

Zineldin, M., Akdag, H. C., & Vasicheva, V. (2011). Assessing quality in higher education: new criteria for evaluating students' satisfaction. *Quality in Higher Education, 17(2),* 231-243.