



Effect of Service Quality on Customers Satisfaction: An Application of HEdPERF Model

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ABSTRACT

The aim of this study was to measure the effect of service quality on customer satisfaction. There are 384 respondents were selected from 19 universities of Khyber Pakhtunkwa (Pakistan). The proportionate stratified sampling method was used for the collection of data. The collected data was analysed using SPSS and AMOS packages. Exploratory Factor, Confirmatory Analysis and Parallel Analysis were also performed. Structural Equation Modelling technique was used to investigate the relationship among variables under investigation. Findings of the research reveals that majority of the respondents were satisfied with the dimensions of HEdPERF model in universities of Khyber Pakhtunkwa (Pakistan). The dimension academic was ranked the most important dimension of service quality. Thus, this unique finding implies that universities should nurture the academic quality rigorously in order to enhance students' satisfaction without ignoring the remaining dimension of service quality.

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1. Introduction

Higher education sector in Pakistan is one of the most developing sectors in the South Asian region, 192 public and private sector universities, with a total enrolment of 12951780 (HEC, 2015). In the modern challenging and competitive academic environment, service quality is considered the most powerful competitive weapon that determining marketing and business strategy (Datta & Vardhan, 2017; Eurydice, 2017). Similarly, customers' satisfaction is also a major challenge for universities and it is also one of the main sources of competitive advantage and customer retention (Razali et al., 2017; Saravanan, 2018). One common challenge faced by every education institution is how to service its students better. Delivering excellent quality service is vibrant and significant for the success and growth of the organization (Ali et al., 2016; Saravanan, 2018). The higher education sector has not been exempted from higher competition and demand for excellent service quality (Felix, 2017; Kawshalya 2016). Currently, students have a wide range of universities services to pick from it. (Datta & Vardhan, 2017; Eurydice,

2017; Saravanan, 2018).

Service quality is considered an essential element for higher education institutions. However, most of the research studies has been conducted in Malaysia (Razali et al., 2017; Ali et al., 2016), India (Saravanan, 2018; Krishnamoorthy et al., 2016), UAE (Datta & Vardhan, 2017; Ibraheem, 2016), UK (Kawshalya, 2016; Douglas et al., 2006), and Africa (Felix, 2017; Liben, 2017), and very few studies has been undertaken to measure service quality of universities in Pakistan. Hence, it is very important for organizations to possess knowledge about the students' behaviour and satisfaction in order to deliver better service quality to its customers.

2. Review of Literature

The increasing interest of researchers in service quality have made the development of different tools to investigate service quality (Cumhur & Aydinli, 2016; Datta & Vardhan 2017; Ibraheem, 2016; Khurana, 2017; Minh & Huu, 2016; Razali et al., 2017; Truong et al., 2016). There is a substantial body of evidence available in the literature that measures the service quality and customer satisfaction in higher education industry. (Asaduzzaman, Hossain, & Rahman, 2013; Bharwana et al., 2013; Choudhury, 2014; Cerri, 2012; Chopra, Chawla, & Sharma, 2014; Cheruiyot & Maru, 2013; Datta & Vardhan, 2017; Donlagic & Fazlić, 2015; Esther-R, 2015; Gallifa & Battle, 2010; Ghotbabadi, Feiz, & Bahar, 2015; Green, 2014; Govender & Ramroop, 2012; Hill, 1995; Ibraheem, 2016; Kanakana, 2014; Khan, Ahmed & Nawaz, 2011; Khodayari & Khodayari, 2011; Kiran, 2010; Koni, Zainal, & Ibrahim, 2013; Malik, 2010; Mosahab, Mahamad, & Ramayah, 2010; Naidoo, 2014; Oliveira, 2009; Rasli et al., 2012; Shah, 2013; Shaari, 2014; Truong et al., 2016; Twaissi & Al-Kilani, 2015; Vaz & Mansori, 2013; Yousapronpaiboom, 2014). Beside the SERVQUAL various others models have been introduced and applied in higher education sector. Cronin and Taylor (1992) derived performance based model (SERVPERF) from the SERVQUAL model. This model was only concentrating on perception aspects of the SERVQUAL model and ignoring expectations aspects of the model. Ho & Wearn (1996) introduced higher education total quality management model of excellence called HETQMEX. This model basically focused on innovative technique rather than traditional one to maintain quality in higher education institutions. In 2016 HESQUAL model was introduced by Teeroovengadum et al., to measures service quality in higher education sector (Teeroovengadum et al., 2016) This model was consists of administrative quality, core educational quality, support facilities quality, physical quality and transfromative quality.

Similarly, various researchers suggested various dimensions of service quality that mostly influence the satisfaction of the customers in higher education industry. Such as Reliability (Cronin & Taylor, 1992; Parasuraman et al. 1988), academic (Abdullah, 2005; Randheer, 2015), Programme quality (Osman et al. 2017), Tangibility (Asefi et al., 2017; Parasuraman et al. 1988), Non-academic (Abdullah, 2005), Culture (Randheer, 2015), Programme issues (Abdullah, 2005; Randheer, 2015), Understanding (Abdullah, 2005), empathy (Asefi et al., 2017; Parasuraman et al. 1988), Access (Abdullah, 2005), responsiveness (Cronin & Taylor, 1992, Mwiya et al. 2017) Reputation (Abdullah, 2005), knowledge (Jiewanto et al. 2012), and Assurance (Asefi et al., 2017; Parasuraman et. 1985),

Osman et al. (2017) conducted a study to examine the association between service quality and students satisfaction. The finding of the study revealed that program quality has strong significant effect on students' satisfaction. Sultan & Wong (2012) found that reliability influence students satisfaction more than other dimensions. On the other hand the study of Twaissi & Al-Kilani (2015) concluded that dimension tangibility has strong effect on students' satisfaction in higher education industry. According to Saravanan (2018) factors that can increases the satisfaction level of customers are knowledgeable employees, friendly employees, helpful employees, better service quality and quick service. Mwiya et al. (2017) recommended that quick and timely response of the employees can increase the level of customers' satisfaction. Jiewanto et al., (2012) found that employees' knowledge and courtesy can inspire trust and confidence of the students which has a significant effect on level of satisfaction. The study of Sultan and Wong (2012) suggested that dimension reliability is the most important dimension of service that significantly affects the satisfaction of the customers. According to Osman et al. (2017) all the dimension of service quality has a significant connection satisfaction of the customers. The study further recommended that dimension programme quality has higher effect on satisfaction in higher education industry. Various researchers suggested that dimension tangibility are significantly associated with customer satisfaction (Asaduzzaman et al. 2013; Bharwana, Bashir, & Mohsin 2013; Datta and Vardhan 2017; Mangin 2013; Truong et al. 2016). On the other hand, researchers recommended that dimension reliability have a significant effect on customer satisfaction (Diab et al. 2016; Chopra, Chawla & Sharma 2014; Khan, Ahmed & Nawaz 2011; Shah 2013).

Yusoff et al., (2015) suggested that physical appearance and fee structure were the main determinants of students'

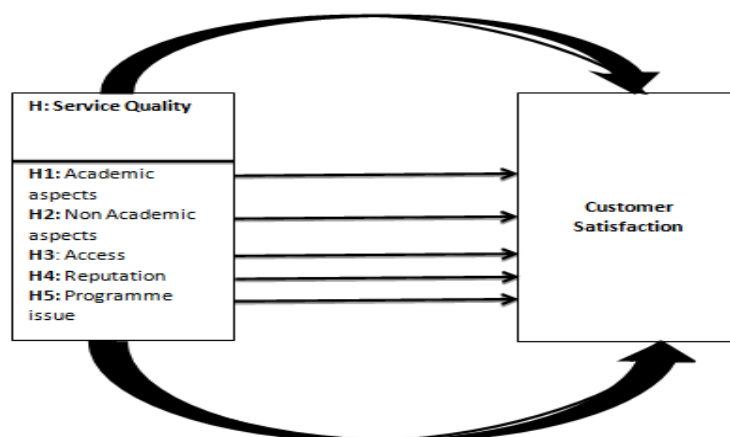
satisfaction. The findings of Onditi et al. (2017), recommended that dimensions academic and non-academic should be incorporated for effective estimation of service quality and students satisfaction in higher education top agenda. The study further suggested that universities should be aware of the important aspects of service quality which are determined by the feedback of the students. SERVQUAL is the most widely used and acceptable model for measuring service quality although higher education industry specific model HEDPERF should be tested in various countries to validate it (Onditi et al., 2017). According to Randheer (2015) academic, non-academic, access, programme issues, reputation, understanding and culture were the most significant dimension of service quality in higher education industry. Brochado (2009) also recommended that HEDPERF scale is a best measurement instrument to measure higher education industry service quality. Various researchers recommended that industry specific model should be used in higher education industry (Kara, 2016; Khalifa & Mahmoud, 2016; Krishnamoorthy et al. 2016; Liben et al., 2017; Osman et al., 2017). Therefore, the current selected the HEDPERF model to use in the current study.

Abdullah (2005) proposed a performance based new measurement scale known is HEDPERF model. This scale was consists of 41 indicators, containing of 13 items adapted from SERVPERF scale and 28 items derived from the literature. HEDPERF model was consists of six dimensions namely, non-academic aspect, academic, access, programme issue and understanding. The objective of HEDPERF model was to develop a scale that measures the service quality of higher education industry. The most important dimension of HEDPERF scale was dimension access (Abdullah, 2005). The study found that students perceived access was the most influential variable to measure service quality, which is related to the approachability, ease of contact, and availability. Later on the HEDPERF scale was modified into five dimensions with 38 items. Non-academic aspects: This dimension related to the duties carried out by the non-academic staffs that fulfil the needs and requirements of the study in the institutions (Abdullah, 2005). Academic aspects: The dimension academic aspect refers to the duties and responsibilities of the academics (Abdullah, 2005). The main duty of academic staff is transmitting of knowledge through research and producing of knowledge through research (Eurydice, 2017). Access: Dimension access relate to the ease of contact, approachability and availability of items (Abdullah, 2005). Programme issues: The dimension programme issue concentrating the importance of specialization offered by the higher education institutions (Abdullah, 2005). Reputation: Reputation denotes the image of the institution perceived by the students (Abdullah, 2005). The Objectives of the study are (i) To investigate the effect of academic aspects on customer satisfaction (ii) To investigate the effect of non-academic aspects on customer satisfaction (iii) To investigate the effect of access on customer satisfaction (iv) To investigate the effect of reputation on customer satisfaction (v) To investigate the effect of programme issues on customer satisfaction. The Hypotheses of the Study are as follows;

- H1: Academic aspects has a significant effect on customer satisfaction
- H2: Non-academic aspects has a significant effect on customer satisfaction
- H3: Access has a significant effect on customer satisfaction
- H4: Reputation has a significant effect on customer satisfaction
- H5: Programme issues has a significant effect of customer satisfaction

3. Conceptual Framework

Figure 1: Conceptual frame work



4. Research Methodology

Public and private sector universities of Khyber Pakhtunkhwa (KP) were the target population of the study. According to HEC (2018) there are 36 universities imparting education in KP out of which 19 universities were selected for data collection on personal judgement. The present study takes into consideration only those universities which are established before 30th June 2010. There are 384 respondents were selected as a sample for the present study. The adequate sample size for the analysis of the data would have a ratio of 10 to 1. In first phase of the sample size only 19 universities were selected for data collection. In second phase of the sample sized proportional allocation technique was applied, where the size of the sample from universities were kept proportional to the sizes of the population. The third phase was consisting of systematic sampling technique with the aim to draw sample from departments and faculties.

According to Hair et al., (2006) specific item would be selected on the basis of random sampling technique in systematic sampling technique. In present study the first item was selected randomly in the class and the remaining unit of sample were selected at fixed interval. The randomly selected unit was every 3rd student in the class row. The adapted questionnaire of Abdullah (2005) was used in the current study. The questionnaire was reliable and already tested by Abdullah (2005) to measure higher education industry performance. Confirmatory Factor analysis was also performed for the item reduction. Firstly construct wise CFA was done and then overall model CFA was performed.

Table 1: Demographic Profile of the Respondents

Gender		Frequency	%age
	Male	273	71.4
	Female	111	28.6
	Total	384	100
Age		Frequency	Per cent
	18-20	106	27.6
	21-25	202	52.6
	26-30	57	14.8
	31-35	17	4.4
	36+	2	.5
Education		Frequency	%age
	Bachelor	151	39.3
	Master	173	45.1
	M.Phil./MS	43	11.2
	PhD	17	4.4
Duration		Frequency	%age
	<1	123	32
	1-2 Years	143	37.2
	2-3 Years	90	23.4
	3-4 Years	28	7.3

4.1 CFA for Academic

Figure 2 represents the original measurement model for the dimension academic. The value of Chi square 29.99 with degree of freedom was statistically significant at $p < 0.001$ level. The other fit indices showed that model was not acceptable (RMSEA = 0.135, GFI = 0.89, CFI = 0.89 and SRMR = 0.021). Thus the model was further investigated in the light of modification indices suggested by different researchers. The error of AD2 and AD5 were highly found correlated with other indicators. Therefore, the AD2 and AD5 were deleted. Table 2 provides the final CFA for the dimension Academic with four indicators.

Figure 2: Dimension Academic

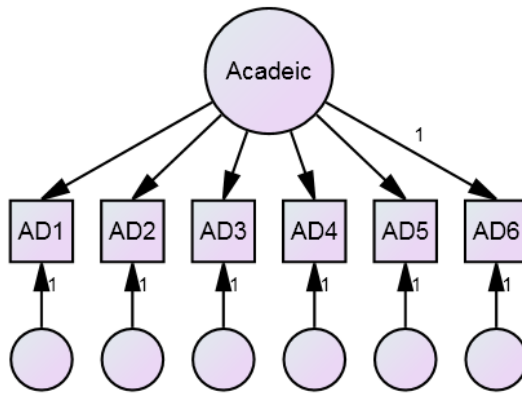


Table 2: Confirmatory Factor Analysis for Academic

Indicators	Loading	Reliability	Error Variance
AD1	0.81	0.731	0.39
AD3	0.79	0.821	0.44
AD4	0.62	0.762	0.51
AD6	0.66	0.837	0.32

Fit indices
 Chi-square = 5.13, df = 2, p = 0.11, RMSEA = 0.058,
 SRMR = 0.082, CFI = 0.952, GFI = 0.973,
 Note: All t-values were significant at p<0.05

4.2 CFA for Access

Figure 3: Dimension Access

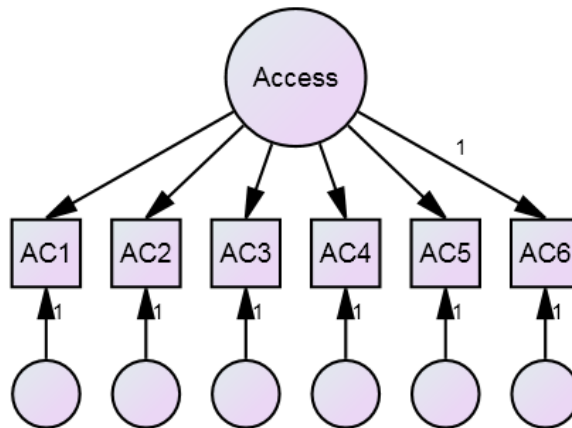


Table 3: Confirmatory Factor Analysis for Access

Indicators	Loading	Reliability	Error Variance
AC1	0.72	0.892	0.23
AC3	0.67	0.793	0.37
AC4	0.80	0.642	0.46
AC6	0.78	0.811	0.51

Fit indices
 Chi-square = 6.39, p = 0.04, RMSEA = 0.063,
 SRMR = 0.072, CFI = 0.932, GFI = 0.881
 Note: All t-values were significant at p<0.05

Figure 3 represents the original measurement model for the dimension academic. The Chi square value of 31.54 with degree of freedom was statistically significant at p<0.001 level. The other fit indices showed that model was not acceptable (RMSEA = 0.151, GFI = 0.90, CFI = 0.84 and SRMR = 0.019). Thus the model was further

investigated in the light of modification indices suggested by different researchers. The error of AC2 and AC5 were highly found correlated with other indicators. Therefore, the AC2 and AC5 were deleted. Table 3 provides the final CFA for the dimension Access with four indicators.

4.3 CFA for Non-Academic

Figure 4 represents the original measurement model for the dimension academic. The Chi square value of 31.55 with degree of freedom was statistically significant at $p < 0.001$ level. The other fit indices showed that model was not acceptable (RMSEA = 0.176, GFI = 0.89, CFI = 0.91 and SRMR = 0.018). Thus the model was further investigated in the light of modification indices suggested by different researchers. The error of NA1, NA3, NA5 and NA6 were highly found correlated with other indicators. Therefore, the NA1, NA3, NA5 and NA6 were dropped. Table 4 provides the final CFA for the dimension non-academic with four indicators.

Figure 4: dimension Non-Academic

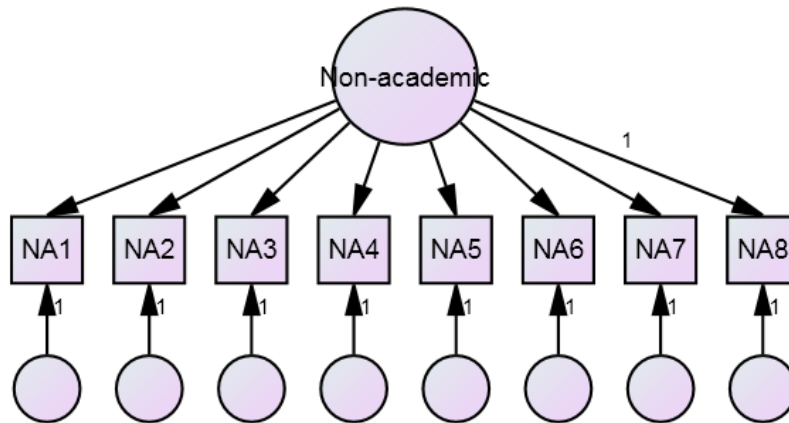


Table 4: Confirmatory Factor Analysis for Non-academic

Indicators	Loading	Reliability	Error Variance
NA2	0.91	0.821	0.29
NA4	0.86	0.683	0.28
NA7	0.64	0.765	0.38
NA8	0.72	0.775	0.42

Fit indices
 Chi-square = 4.88, $p = 0.03$, RMSEA = 0.043
 SRMR = 0.114, CFI = 0.964, GFI = 0.921
 Note: All t-values were significant at $p < 0.05$

4.4 CFA for Programme

Figure 5: Dimension Programme

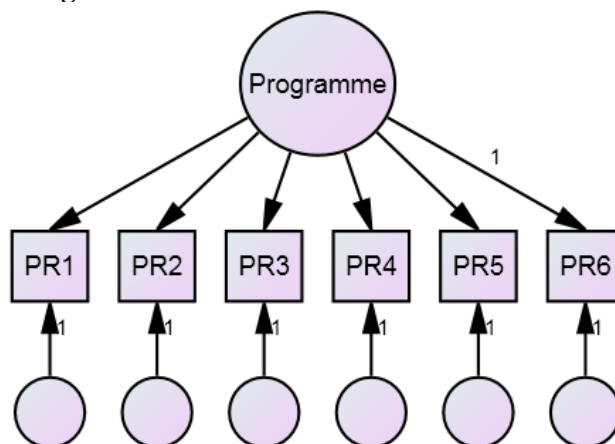


Figure 5 represents the original measurement model for the dimension academic. The Chi square value of 21.76 with degree of freedom was statistically significant at $p < 0.001$ level. The other fit indices showed that model was not acceptable (RMSEA = 0.234, GFI = 0.85, CFI = 0.89 and SRMR = 0.075). Thus the model was further investigated in the light of modification indices suggested by different researchers. The error of PR1 and PR3 were highly found correlated with other indicators. Therefore, the PR1 and PR3 were deleted. Table 5 provides the final CFA for the dimension Programme with four indicators.

Table 5: Confirmatory Factor Analysis for Programme

Indicators	Loading	Reliability	Error Variance
PR2	0.88	0.751	0.48
PR4	0.76	0.861	0.25
PR5	0.64	0.679	0.31
PR6	0.80	0.743	0.40
Fit indices			
Chi-square = 6.28, $p = 0.05$, RMSEA = 0.047			
SRMR = 0.035, CFI = 0.932, GFI = 0.910			
Note: All t-values were significant at $p < 0.05$			

4.5 CFA for Reputation

Figure 6 represents the original measurement model for the dimension academic. The Chi square value of 25.84 with degree of freedom was statistically significant at $p < 0.001$ level. The other fit indices showed that model was not acceptable (RMSEA = 0.201, GFI = 0.89, CFI = 0.90 and SRMR = 0.120). Thus the model was further investigated in the light of modification indices suggested by different researchers. The error of RU3 and RU4 were highly found correlated with other indicators. Therefore, the RU3 and RU4 were deleted. Table 6 provides the final CFA for the dimension Reputation with four indicators.

Figure 6: Dimension Reputation

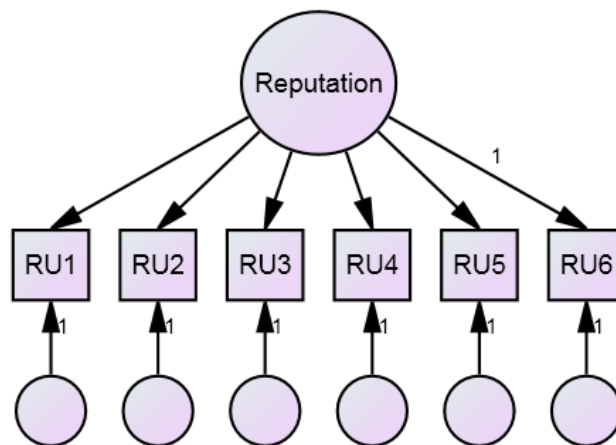


Table 6: Confirmatory Factor Analysis for Reputation

Indicators	Loading	Reliability	Error Variance
RU1	0.83	0.791	0.44
RU2	0.74	0.835	0.51
RU5	0.71	0.731	0.33
RU6	0.84	0.658	0.28
Fit indices			
Chi-square = 4.12, $p = 0.05$, RMSEA = 0.065			
SRMR = 0.062, CFI = 0.912, GFI = 0.951			
Note: All t-values were significant at $p < 0.05$			

4.6 CFA for Customer Satisfaction

Figure 7 represents the original measurement model of customer satisfaction. The model was examined in the light of various indices suggested by various researchers. The error of CS2, CS7, CS8 and CS9 were found correlated

with other indicators. Therefore, the above mentioned indicators were dropped.

Figure 7: Customer Satisfaction

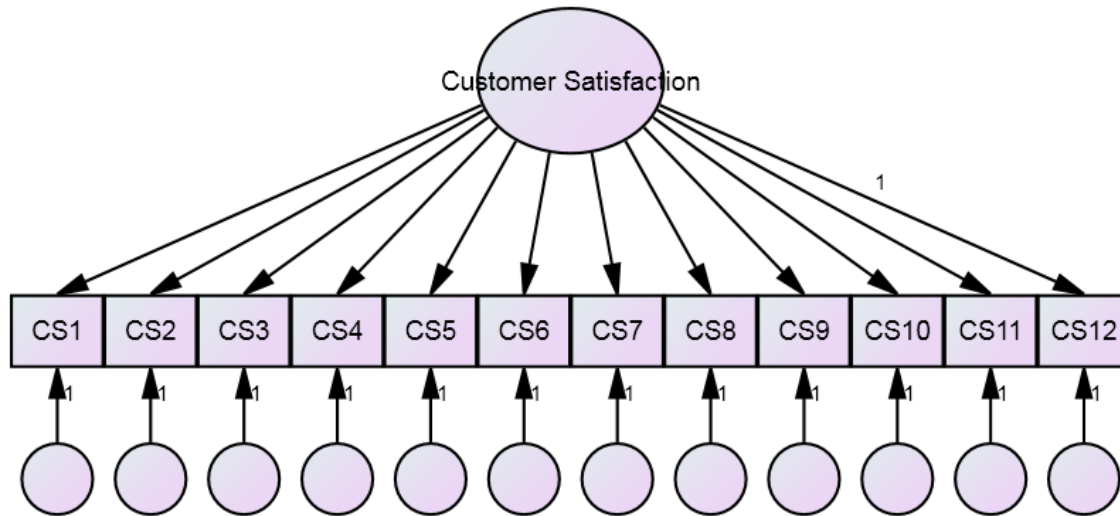


Table 7: CFA for Customer Satisfaction

Indicators	Loading	Reliability	Error Variance
CS1	0.79	0.712	0.22
CS3	0.83	0.697	0.32
CS4	0.80	0.871	0.44
CS5	0.75	0.893	0.27
CS6	0.88	0.756	0.39
CS10	0.72	0.684	0.20
CS11	0.91	0.734	0.35
CS12	0.82	0.712	0.19
Fit indices			
Chi-square = 5.33, p = 0.05, RMSEA = 0.512			
SRMR = 0.063, CFI = 0.957, GFI = 0.932			
Note: All t-values were significant at p<0.05			

Table 8: Parallel Analysis

Dimension	Random Eigenvalue	Eigenvalue from PCA	Decision
Academic	1.0196	1.0763	Retained
Non-academic	1.0176	1.0682	Retained
Access	1.0082	1.0132	Retained
Reputation	0.0871	0.0911	Retained
Programme	0.0785	0.0853	Retained
Understanding	0.0654	0.0701	Dropped
Overall model Fit indices			
Chi-square = 3.22, p = 0.04, RMSEA = 0.034			
SRMR = 0.071, CFI = 0.932, GFI = 0.943			
Note: All t-values were significant at p<0.05			

Figure 8: Overall model

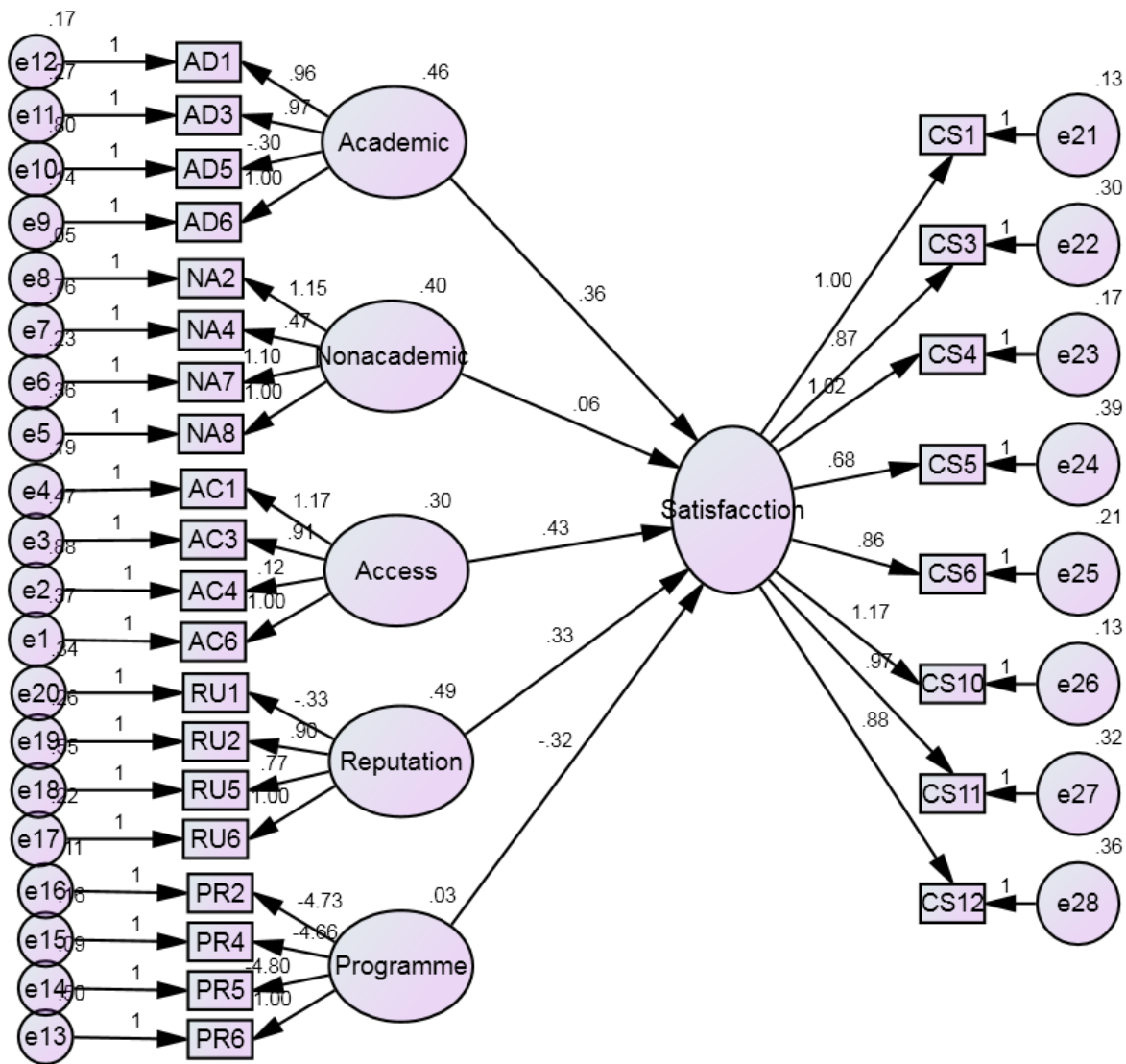


Table 9: Summary of Hypotheses Testing

Dependent		Independent	Hypotheses	Estimate	S.E.	C.R.	P	Decision
Customer Satisfaction	<---	Academic	H1	.336	.033	10.234	***	Accepted
Customer Satisfaction	<---	Non-academic	H2	.069	.025	2.768	.006	Accepted
Customer Satisfaction	<---	Access	H3	.466	.052	8.894	***	Accepted
Customer Satisfaction	<---	Programme	H5	-.232	.117	-1.978	.068	Rejected
Customer Satisfaction	<---	Reputation	H4	.352	.036	9.717	***	Accepted

Hypothesis 1: Academic aspects has a significant effect on customer satisfaction

Hypothesis 1 investigated the effect of academic aspects on customer satisfaction. The path coefficient of 0.36 and the p-value were significant, the hypothesis was accepted by the study.

Hypothesis 2: Non-academic aspects has a significant effect on customer satisfaction

Hypothesis 2 investigated the effect of non-academic aspects on customer satisfaction. Since the standardized path coefficient of 0.40 and the p-value were significant, indicating that non-academic aspects has strong effect on customer satisfaction. Therefore, the hypothesis was accepted by the study.

Hypothesis 3: Access has a significant effect on customer satisfaction

Hypothesis 3 investigated the effect on dimension access on customer satisfaction. The standardized path

coefficient of 0.43 and the p-value were significant, indicating that access has positive effect on customer satisfaction. Therefore, hypothesis was accepted by the data.

Hypothesis 4: Reputation has a significant effect on customer satisfaction

Hypothesis 4 investigated the effect on dimension reputation on customer satisfaction. The standardized path coefficient of 0.33 and the p-value were significant, indicating that dimension reputation has a significant effect on customer satisfaction. Hence the hypothesis is supported.

Hypothesis 5: Programme issues has a significant effect of customer satisfaction

Hypothesis 5 investigated the effect of programme issues on customer satisfaction. The standardized path coefficient -0.32 and the p-value 0.068 were negatively insignificant, indicating that programme issues has slightly negative effect on customer satisfaction. Hence the hypothesis is not supported by the data.

5. Discussion and Conclusion

The overall model fit indices reveals that RMSEA 0.034 which is lower than the suggested value of 0.08 (Hair et al. 2010). The value of CFI 0.932 was greater than the suggested value of 0.9. Similarly, the Chi square value was 3.22 and which was significant at 0.04. According to Hair et al. (2010) at least one index must be satisfied the minimum acceptable level of goodness of fit. Hence, the present study presented a good model fit for the analysis of data. Table 8 indicates the statistically significant association between independent and dependent variables. In higher education sector faculty members and other supporting facilities are considered the most important significant indicators of customer satisfaction (Kara, 2016; Liben et al., 2017). According to Khalifa and Mahmood (2016) academic and non-academic aspects were the most influential dimensions of customer satisfaction in higher education industry. Krishnamoorthy, Aishwaryadevi and Bharathi (2016) added that besides the academic and non academic aspects the teaching material and curriculum were the key determinants of customer satisfaction. Farahmandian (2013) and Yusoff et al. (2017) also found that academic aspects, curriculum and teaching methods were the most significant dimension of customer satisfaction.

Table 9 highlights the statistically significant association between HEdPERF model and students satisfaction. The dimensions academic aspect (estimate, .336), reputation (estimate, .352), non-academic (estimate, .069) and access (estimate, .466) are significantly associated with the satisfaction of the students. On the other hand, the dimension programme has statistically insignificant relationship with students' satisfaction, which estimate -.232 units. Therefore, the hypotheses H1, H3, H4, and H2 are accepted and H5 is rejected.

According to Kara (2016) quality of teaching and teaching facilities were the most significant dimensions of customer satisfaction. Teaching faculties and supporting facilities were considered the most influential variables of students' satisfaction (Liben et al., 2017). On the other hand, Khalifa & Mahmoud (2016) found that non-academic staff helpfulness and academic staff individualized attention were positively associated with students' satisfaction. Onditi et al. (2017) found that dimension academic aspects and non-academic aspects were the main predictor of customer satisfaction in higher education industry. Randheer (2015) suggested that dimension culture significantly affect the satisfaction of the customers.

In higher education industry students considered curriculum, staff competency, academic aspects and teaching methods were the most significant variables (Krishnamoorthy, Aishwaryadevi, & Bharathi, 2016). Various researchers considered the dimension academic aspects the most influential variable of students' satisfaction (Liben et al., 2017; Kara, 2016; Osman et al., 2017). According to Farahmandian et al., (2013) academic aspects, teaching curriculum and teaching quality were significantly associated with students' satisfaction. The study of Osman et al., (2017) revealed that programme quality was the most powerful dimension of students' satisfaction in Bangladesh higher education industry. Garci a-Aracil (2009) found teaching quality, course outlines and teaching material were the most influential variables of students' satisfaction in European countries. Similarly, Navarro, (2005) found academic staff and teaching techniques were highly significant association with satisfaction. Hence, better service quality and satisfied customer can bring competitive advantage (Channoi, 2014), particularly building a brand name of the institution (Arpan, Raney, & Zivnuska, 2003; Dib & Alnazer 2013; Druteikiene, Feldman et al., 2014; Khalifa & Mahmoud, 2016; Kim & Periyayya, 2013; Kantanen, 2012; Stimac & Simic, 2012; Teo & Soutar, 2012).

Public and private sector higher education institutions should be aware of the importance of the education. Similarly, competition in the higher education sector is also getting tighter with the increase of private higher education institutions. Every university is trying their best to win the competition, therefore, it need continuous

service quality improvements including the academic aspects, reputation, non-academic, program and access. The current study found academic is the most important and influential dimension of service quality, that bring a big difference in the level of satisfaction of the customers. Therefore, both sector universities should concentrate on all aspects of service quality and particularly on dimension academic.

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