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Measurement of e-services quality: an empirical study of University of Bahrain

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Abstract In the last decade the Information Communication Technologies (ICTs) have significantly revolutionized the educational sector. With an increasing number of universities and its presence on the website, the e-service quality is becoming a vital concern toward satisfying the students who are the main stakeholder. E-service quality and e-satisfaction relationship is previously tested. However, the pervasiveness of internet use in education warrants measuring e-service quality a high importance. Therefore, this research aims at measuring the e-services quality and its impact on student e-satisfaction at University of Bahrain (UoB). Toward this aim, a research model was developed and tested. A questionnaire consisting 33 of Likert type items were distributed. Primary data were collected from 390 students. Regression analysis was used to determine if the quality of dimensions (website design, reliability, responsiveness, ease of use, and privacy) have an impact on students' e-satisfaction. The results show that all of the dimensions of e-services quality have an impact on student's e-satisfaction expect for the dimension of ease of use. Thus, according to the results of this research, there is insufficient evidence of the effect of ease of use directly on students' e-satisfaction. The contribution of this article relates to the fact that the proposed model integrates in a holistic way various relevant factors affecting e-service quality into a single model that can be adopted to measure the e-services at university. In addition, the researchers present some recommendations for UoB to apply e-services quality dimensions through websites, and some suggestions for future research.

Keywords E-satisfaction · E-services · Quality · Satisfaction,reliability · Responsiveness · Ease of use · Privacy · Higher education · University of Bahrain

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1 Introduction

Nowadays, e-services such as enrolment, course delivery, course support, and library lending are rapidly becoming standards within the education sector (Sutarso and Suharmadi 2011). Thus, most universities provide their information and services through web portal. However, with the increase of the competition in the educational sector of the higher education the students have many options to choose. Therefore, factors that assure the satisfaction of students has to be highly considered so that to achieve the competitive advantage considering the quality as one of the main factors. Oliveira et al. (2002) state that the quality of is a critical factor for companies to retain and attract customers in the digital age. Kim-soon et al. (2014) pointed out that dimensions of quality of measures are mostly used in the commercial business sector and not that common in the education sector. Thus, which raises that Kim-Soon and Ahmed (2012) stressed on the need to focus on measurement of especially in the University context (Abd Rahman and Ahmed 2014).

Currently, despite many studies concerning quality relatively few studies have been conducted in educational institutions especially in GCC including the Kingdom of Bahrain especially with the extending growth in the Bahraini universities sector leaded to increase competition between the universities. This study focuses on e-service quality dimensions with an empirical study on University of Bahrain e-service. The purpose of this study is to measure the relationship between e-service quality and e-satisfaction.

The rest of this paper is organized as follows. Following the introduction, the second section provides a relative background on both customer satisfaction and e-service quality constructs. The third section presents the research hypotheses and research model. The fourth section is the data analysis, and the fifth section discusses the results and the findings of this study. Finally, the study concludes with a discussion of the limitation of the study, and the future research in this field is presented as well.

2 E-service quality

Since the beginning of 2000, the concept of e-service has been used increasingly by researchers and practitioners (Ojasalo 2010). With various applications of ICT including e-commerce, e-government, e-banking, e-learning and etc., measurement quality of electronic services is one of the ways that will allow us to be aware of the quality of these applications. Thus, in 2002, Electronic service quality was introduced by Zeithaml et al. (2002) who defined it as “the extent to which a website facilitates efficient and effective shopping, purchasing and delivery of products and services”.

With the increase of the electronic adoption for services delivery, the importance of measuring the stakeholders’ satisfaction through measuring and monitoring the quality of these services has became a vital issue. Zeithaml (2002) and Parasuraman et al. (2005) conducted research on the quality of Internet services which was based on the initial research that has been done on the quality of traditional distribution called SERVQUAL model that was first developed by Parasuraman et al. (1988). Many researchers then developed electronic services quality studies and they used many dimensions and models for their context

including online shopping website (Yoo and Donthu 2001; Francis and White 2002; Santos 2003; Bauer et al. 2006; Lee and Lin 2005), bookstores, CDs and Videos(Parasuraman et al. 2005; Wolfinbarger and Gilly 2003), airline reservation (Park et al. 2007; Loiacono et al. 2002) and other private sectors.

In the public sector and particularly in e-government services, many researchers have used different dimensions (Cox and Dale 2001; Madu and Madu 2002; Yang and Fang 2004; Halaris et al. 2007; Agrawal et al. 2008; Zaidi and Qteishat 2012; Alhyari and Alhyari 2014).

In the context of university, many researchers also developed their models to measure the e-service quality (Einasto 2014; Yaghubia et al. 2014; Al Shamayleh et al. 2015). The following sections provide more details about measuring e-services quality in higher education institutions.

3 E-service quality in higher education

In the last decades, the number of services provided to students through Information and Communication Technologies has been increasing specially with the Internet. Towards better communication between the universities and their students that in turn affect their sustainability and competitive advantage, many researches considered e-service quality as a critical success factor for the firms endeavors to distinguish their self from other competitors (Abd Rahman and Ahmed 2014) and in the educational institutions, the quality has received a great attention by researchers (Angell et al. 2008). Zeithaml (2000) and Cronin (2003), stressed that by focusing on e-service quality many strategic benefits can be gained and the enhancement of operational efficiency and profitability can be achieved. Thus, Santos (2003) stressed on the impact of quality on stakeholders' attractiveness and retention which in turn can enhance the online competitive advantages of companies. Also the measure of the quality of e-services in higher education is of great importance in attracting and retaining tuition-based returns (Tariq et al. 2013). In the literature, there are many studies for measuring quality of e-services at educational sector.

Shah and Attiq (2016) presented a model that measures the perceived ease of use and perceived usefulness in the formation of consumer's satisfaction in the Context of E-learning where they approved that both perceived use of and usefulness has a positive impact on formation of Consumer's Satisfaction in the E-learning.

Al Shamayleh et al. (2015) developed a model for measuring the quality of E-Services and its impact on student satisfaction at Jordanian universities. The results show that all the factors considered in their model including website design, reliability, efficiency, responsiveness, ease of use, availability and privacy have an impact on students' satisfaction.

Yaghubia et al. (2014) studied student's e-satisfaction from e-services of university of students of university of Sistsn and Baluchestan on 377 students The results showed that all components of research including efficiency and quality, accountability, electronic payment, electronic registration, graphic and design and security are effective on student's e-satisfaction from e-services of university.

Allahawiah (2013) explored the major factors affecting user's utilization and satisfaction of e-services offered by Al-Balqa Applied University using 582 respondents. Results of the study showed that there is an impact of reliability, responsiveness, information quality, security, and usability on the user's satisfaction and intention toward e-services.

Nasirun et al. (2012) presented a model to measure the factors of Web Service Quality for Students' Portal for undergraduate students located in the northern region of Peninsular Malaysia. The result revealed five different dimensions of service quality web portals. These dimensions are identified as Usability, Responsiveness, Accessibility, Attractiveness and Overall Satisfaction.

Khattab Al and Fares (2011) measured the satisfaction of the students at Al-Hussein Bin Talal University, Jordan, with the quality of Student Information System (SIS). The results of the questionnaire showed that the students were satisfied by the transition to e-services and the SIS has a positive impact on the students' satisfaction considering many factors which are Reliability, Assurance, Tangibility, Empathy and Responsiveness.

Lee and Kim (2010) conducted a study to analyze the students' satisfaction of campus-wide information systems in Korean universities.. The results of this study showed that information and system satisfaction significantly affected the overall user satisfaction with campus-wide information system.

Table 1 summarizes a list of reviewed studies.

4 E-Services at University of Bahrain (UoB)

e-Services at University of Bahrain started with the emergence of the Internet at UoB in 1996. At the beginning of 2000, the e-mail service was offered with a capacity of 200 MB until it reaches into 4–10 GB nowadays. In 2003, the website for University of Bahrain (www.uob.edu.bh) was established as a static website until it developed into more interactive website that is linked to the social media websites. Thus, in 2016, the website is renovated so more interactive e-services are offered and more robust performance is achieved as more than 60,000 students can access and accomplish transactions at once. The website provides the e-Services for both students and faculty members. For the students, the website provides them with e-Services such as E-mail, Black-Board, Library Services, Course Evaluation Survey, etc. As the website is renovated recently, it is essential to measure the students' satisfaction that is the focus on this research toward better e-Services improvement specially for students who are the main stakeholder of the University.

5 Satisfaction and e-satisfaction

Kotler and Clarke (1987) define satisfaction as "a state felt by a person who has experienced a performance or an outcome that fulfill his or her expectation". Furthermore, Oliver (1997, pp.13) defines satisfaction as a pleasure level toward a product or service feature or the product or service itself either

Table 1 Review of' Quality Models and Dimensions for e-services at educational sector (university)

Author	Research title	Factors of e-QS
Shah and Attiq (2016)	Impact of Technology Quality, Perceived Ease of Use and Perceived Usefulness in the Formation of Consumer's Satisfaction in the Context of E-learning	Perceived Ease of Use Perceived Usefulness
Al Shamayleh et al. 2015	Measuring the quality of and its impact on students satisfaction at Jordanian Universities	-Website design -Reliability -Responsiveness -Privacy -Ease of use -Efficiency -Availability
Yaghubia et al. 2014	Study of student's e-satisfaction from e-services of university	-Performance -Security -Graphic and design -Online services -Electronic registration -Accountability
Allahawiah 2013	Factors Affecting the Use of from User Perspectives: A Case Study of Al-Balqa' Applied University	-Information Quality -Reliability -Security -Responsiveness -Usability
Nasirun et al. 2012	Perceived Web Service Quality for Students' Portal in Higher Learning Institution	Usability, Responsiveness, Accessibility, Attractiveness
Khattab Al and Fares 2011	Assessing Students' Satisfaction with Quality of services of students Information System	-Reliability -Assurance -Tangibility -Empathy -Responsiveness
Lee and Kim 2010	Student User Satisfaction with Web-based Information Systems in Korean Universities	System Satisfaction Information Satisfaction

provided or is providing which means after using the product/service or while using it. In the context of higher education, William (2002) stressed that it is risky to consider students as customers but given the current atmosphere of it there is a new moral privilege where student become "customer" as they are fee payers which demand that their views be heard and acted upon. Carey et al. (2002), believes that satisfaction covers both students' perception and experiences during the college years.

The students' satisfaction in higher education and its influential factors become an interesting area for investigation due to its significant impact on the educational institutions' reputation. Mai (2005) found that most influential predictors of the students satisfaction include the impression of the educational institutional, overall impression of the quality of the education, teachers expertise and their interest in their subject, the quality and accessibility of IT facilities and the prospects of the degree furthering students careers. A study by Soares and Simões (2015) that carried out in a Portuguese university focusing on the sources used students use to select a higher education institute found that the university's website is considered

the most important source of information which makes the website of the university a vital area for focus on.

Nowadays with the use of internet to deliver the products or services, Lee and Turban (2001) used the term Electronic satisfaction(e-Satisfaction) to reflect the customer satisfaction levels towards support for sending and receiving orders for goods or services, quality website content, website speed, reliability website, ease of website use, security that is the concern of this research.

6 Research model and hypotheses

6.1 Research model

After reviewing the literature and research conducted in e-service quality measurements since 2000 until now across different industries and countries, seven factors were repeated within the different developed models which are web design, ease of use, content, responsiveness, reliability, security and privacy. These seven criteria were also repeated in the researches that were conducted in the education industry that is presented in Table 1. Accordingly, the research model is developed to include these criteria as depicted in Fig. 1 that is named as "e-QS measurement for UoB in which seven factors are independent variables for the e-service quality (dependent variable) which is in turn independent variable for student's e-satisfaction.

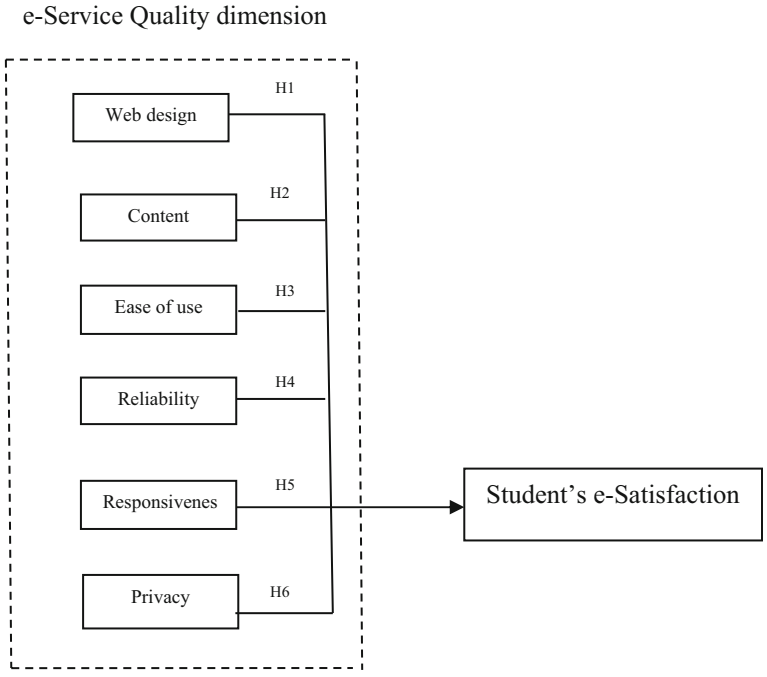

Fig. 1 Research model of e-QS measurement for UoB

6.2 Research constructs and hypotheses

The developed research model as presented in Fig. 1 consists of the following constructs:

1. **Web site design** describes the appeal that user interface design presents to customers (Kim and Lee 2002). Wolfinbarger and Gilly (2003) mentioned that web site design factors are strong predictors of customer quality judgments and e-satisfaction. Furthermore, Al Shamayleh et al. 2015) approved that Website design has a significant impact on student's satisfaction. Hence, the following hypotheses are proposed:

   H1. UoB website design positively influences student's e-satisfaction

2. **Content** refers to the quality of information in terms of completeness, accuracy, conciseness and relevancy and timeliness (Papadomichelaki and Mentzas 2012). Allahawiah (2013) presented the information quality/content as one of the main factor that contributes to the quality of website of the applied university that was his context of study. Also, Stacie et al. (2006), Delone and Mclean (2002) and Mckinney et al. (2002) have demonstrated the positive relationship between information quality and satisfaction.

   Accordingly, the following hypotheses are proposed:

   H2. Content UoB website design positively influences student's e-satisfaction

3. **Ease of use** is defined how easy it is for customers to use website (Li and Suomi 2009) . Ease of use has been highly rated in customers' e-service quality measurement, and it has been noted by some researchers to have direct relationship with the satisfaction (Shah and Attiq 2016; Al Shamayleh et al. 2015). Therefore, we proposed the following:

   H3. Ease of use *of UoB website positively influences student's e- satisfaction*

4. **Reliability** refers to commitment to ensure reliable, accurate and on-time services to users (Al Balushi and Ali 2016). Zhu et al. (2002) argued that reliability dimension has a direct positive effect on customer satisfaction. Wolfinbarger and Gilly (2002) found that reliability is one of the strongest predictors of customer satisfaction.

   H4. Reliability of UoB website positively influences student's e-satisfaction

5. **Responsiveness** in e-service refers to the ability of the company to provide prompt service to customers through digital media when customers have questions or problems and make them more comfortable (Li and Suomi 2009). Yang and Jun (2002) and Zhu et al. (2002) have highlighted that responsiveness is important customer satisfaction. Accordingly, the following hypotheses are proposed:

H5. Responsiveness of UoB website positively influences student's e-satisfaction

6. **Privacy** refers to the "degree to which the website is safe and customer information is protected" (Li and Suomi 2009). Al Shamayleh et al. (2015) mentioned that the privacy is one of the key factors that affect e-service quality. Wolfinbarger and Gilly (2003) also found that privacy is one of the four predictor of customer satisfaction of e-services. Therefore, the following hypotheses are proposed.

H6. **Privacy** *of UoB website positively influences student's e-satisfaction*

The last hypothesis is related to the relationship between the quality and satisfaction in which many research mentioned that in perceived service quality is an antecedent to satisfaction (Spreng and Mackoy 1996) even in higher education context as Bigne et al. (2003) and Elliott and Shin (2002) who indicated that there is a strong and direct relationship. Thus, we can propose that:

7. *H7.* Overall quality *of UoB website positively influences students' e-satisfaction.*

7 Research methodology

7.1 Research instrument

Field research was conducted using a structured questionnaire, by utilizing developed model. The conceptual framework of the present study is shown in Fig. 1. The questionnaire that was used for field research comprised the following three distinct sections: (1) Customer demographics. Questions in this section aimed to capture the gender, level of study, year of study and college that the students belong to (2) E-service quality measurement. This section comprised 28 items measuring the following dimensions: Web design: four items. Content: five items. Ease of Use: six items. Reliability: four items. Responsiveness: five items. Privacy: four items (3) Satisfaction: five items. This section aimed to measure student satisfaction. For each question of part 2 and 3 we used five-point Likert-scale starting from strongly agree and ending with strongly disagree.

7.2 Research sample

The survey target sample consisted of students' studying at University of Bahrain, who had used the UoB services on the UoB website. The resulting sample comprised of 390 valid questionnaires. Simple Random Sampling (SRS) was applied so that each student remaining in the population of UoB has the same probability of being selected for the sample.

7.3 Data collection

Questionnaires were distributed via Google forms in which the representative of the Student council was the main point of contact who distributed the online questionnaire to the UoB students. For online survey, the respondents were contacted through emails, WhatsApp and other social – media group to get the questionnaires filled.

7.4 Data analysis procedures

The researchers used two types of analysis using SPSS. The first one is descriptive analysis for the demographic and usage statistics. For the hypotheses testing, the authors used multiple regression analysis as the research model contained more than one dependent variable through which researchers responded to the questions that consider the task(s) that multiple independent variables participate in accounting for variance in a single dependent variable.

7.5 Data sample

Total of 390 responses were collected in which the higher number of responses were received from female 263(67.4%) whereas, male responses were only 127(32.6%).On the other hand analysis shows that mostly 1st year users were higher than other year of study that is 101(25.9)%. While based on level of study significant responses were received from Undergraduate 359(92.1%) and the least amount of responses was from Master 5(1.3%) only. Table 2 summarizes and presents the analysis of the demographic distribution in detail.

8 Usage of UoB e- services

As UoB provide different services through its website. Table 3 below illustrates in detail the type of E_ services mostly used based on year of study. Overall, the results show that E-mail and Black Board is widely used by users concerning all years of study collectively that's E-mail (80.9%) and BlackBoard (80.5%) whereas, Online Registration is (78.6%)

Table 2 Demographic Information of Participants

Demographic Profile		Frequency	Percent (%)
Gender	Male	127	32.6
	Female	263	67.4
	Total	390	100.0
Year of Study	1st Year	101	25.9
	2nd Year	96	24.6
	3rd Year	84	21.5
	4th Year	66	16.9
	5th Year	38	9.7
	Other	5	1.3
	Total	390	100.0
Level of Study	Under Graduate	359	92.1
	Master	5	1.3
	PhD	17	4.4
	Other	9	2.3
	Total	100	100.0

Table 3 Usage Percentage of UoB e-services

Type of e- Services	Year of Study						Total
	1st Year	2nd Year	3rd Year	4th Year	5th year	Other	
e-mail	20%	18.9%	18.4%	15.3%	7.1%	1.2%	80.9%
BlackBoard	19.4%	18.7%	17.6%	15.1%	8.7%	1.0%	80.5%
Admission Result	4.1%	8.7%	5.3%	5.6%	3.3%	0.5%	27.5%
Library Services	1.0%	1.7%	3.8%	4.6%	1.0%	0.7%	12.8%
Online Registration	13.5%	19.4%	18.9%	16.4%	9.2%	1.2%	78.6%
Course Evaluation survey	3.3%	9.2%	12.0%	11.2%	7.1%	1.0%	43.8%

and Course Evaluation Survey is (48.3%) and Admission Result services is used by only (27.5%) users. The results indicate that the least amount of e-service that is used by students is Library Service with only (12.8%).

9 Validity test

The data validity test was performed using SPSS**.** Eisenhardt (1989) defined Validity as "*A procedure that was intended to confirm the validity of the research, allowing the triangulation of multiple data sources, and helping to reduce the restrictions arising from using a single informant*". All exponents extracted have a value of 0.5 and above which is acceptable and proves that items are valid (Saane et al. 2003).

Table 4 summarizes the validity test performed, displaying the factor loading for each item in the distributed questionnaire. All exponents extracted have a value of 0.5 and above which is acceptable and proves that items are valid (Saane et al. 2003).And component whose value is less than 0.5 are dropped but in our extracted values all are above 0.5 that shows good validity thus no item is dropped.

10 Reliability test

In this section we provide details of how the constructs mentioned in the questionnaire are tested to be reliable or not. According to Campbell and Fiske (1987), reliability is *'An agreement between two efforts to measure the same thing with the same method'*. Cherry (2016) stated that reliability is the reference to the consistency of a measure. There are many different types of reliabilities; inter-rater reliability, parallel-forms reliability, test-tester reliability and internal consistency reliability. For this research purpose, internal consistency reliability is chosen.

Table 5 shows the results of alpha coefficients for each factor with reliability analysis. Person correlation was used to describe the strength and direction of the relationship between two variables. The Cronbach's Alpha is the numercial coefficient of reliability. The Cronbach's Alpha values for each factor are from .705 to .952. Since all the factors are above 0.7, which demonstrates good internal consistency and suggests good convergent validity and reliability of the measures in this study (Fornell and Larcker 1981).

Table 4 Factor Loading for Each Item in the distributed questionnaire

Item	WebD	WebC	Ease	Reli	Resp	Privacy	Satisfaction
WebD1	.807						
WebD2	.791						
WebD3	.812						
WebD4	.724						
WebC1		.737					
WebC2		.792					
WebC3		.807					
WebC4		.746					
WebC5		.674					
Ease1			.758				
Ease2			.811				
Ease3			.723				
Ease4			.810				
Ease5			.753				
Ease6			.727				
Reli1				.706			
Reli2				.826			
Reli3				.765			
Reli4				.707			
Resp1					.662		
Resp2					.743		
Resp3					.820		
Resp4					.833		
Resp5					.736		
Privacy1						.702	
Privacy2						.749	
Privacy3						.915	
Privacy4						.750	
Satisfaction1							.684
Satisfaction2							.897
Satisfaction3							.889
Satisfaction4							.861
Satisfaction5							.820

WebD, Website Design; *WebC,* Website Content; *Ease*, Ease of use; *Reli*, Reliablity, *Resp*, Responsiveness; *Privacy*, Privacy; *Satisfaction*, Satisfaction

After conducting the reliability analysis the item WebC5, Resp1 and Satisfaction1 were removed. Table 6 shows the no of items that were used to achieve reliability after removing some items based on Cornbach's Alpha (Tavakol and Dennick 2011) defined Cronbach's Alpha as "*the extent to which all the items in a test measure the same concept or constructs*". All cronbach s alpha is greater than 0.7 so these are acceptable.

Table 5 Cronbach s alpha for each construct

Item	WebD	WebC	Ease	Reli	Resp	Privacy	Satisfaction
WebD1	.807						
WebD2	.791						
WebD3	.812						
WebD4	.724						
WebC1		.737					
WebC2		.792					
WebC3		.807					
WebC4		.746					
WebC5		.674					
Ease1			.758				
Ease2			.811				
Ease3			.723				
Ease4			.810				
Ease5			.753				
Ease6			.727				
Reli1				.706			
Reli2				.826			
Reli3				.765			
Reli4				.707			
Resp1					.662		
Resp2					.743		
Resp3					.820		
Resp4					.833		
Resp5					.736		
Privacy1						.702	
Privacy2						.749	
Privacy3						.915	
Privacy4						.750	
Satisfaction1							.684
Satisfaction2							.897
Satisfaction3							.889
Satisfaction4							.861
Satisfaction5							.820

11 Hypotheses testing

As the research model contains more than one dependent variable, the multiple linear regression analysis is used to test the hypotheses. Moreover, the linear regression analysis cannot test the entire hypotheses together as one relationship in a single statistics test so different separate regression models were used to test the model as a whole.

Table 6 Cronbach s alpha for each factor

Factors	Original No of Items	Number of Items (After dropped item to achieve reliability)	Cronbach's Alpha
Website Design	4	4	.864
Website Content	5	4	.853
Ease of Use	6	6	.893
Reliability	4	4	.873
Responsiveness	5	4	.864
Privacy	4	4	.857
Satisfaction	5	4	.923

From the results shown in Table 7 below, **website design** has a significant direct effect on student e-satisfaction (sig = 0.000 < 0.05). **Reliability** has a significant direct effect on student e-satisfaction (sig = 0.009). **Responsiveness** has a significant direct effect on student satisfaction (sig = 0.000 < 0.05). The results also suggest that **website design** has a significant direct effect on student satisfaction (sig = 0.007 < 0.05). **Privacy** has a significant direct effect on the student satisfaction (sig = 0.022). However, the results found that ease of use has an insignificant direct effect on student satisfaction (sig = 0.068). The responsiveness has the strongest effect on e-satisfaction with Beta coefficient 0.313, then reliability 0.291, web design 0.205, website content 0.136, and privacy 0.92 respectively.

Accordingly, all stated hypotheses are accepted except Ease of use as presented in Table 8.

12 Discussion of the findings

H1: It was found that there is a significant impact of website design on student's e-satisfaction which is similar with previous research conducted (Al Shamayleh et al. 2015; Yaghubia et al. 2014; Einasto 2014). It was stressed that youth and

Table 7 Coefficients values for Regression Model

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Website Design	.205	.047	.183	4.404	.000
Website content	.136	.050	.109	2.722	.007
Ease of Use	.095	.052	.073	1.829	.068
Reliability	.291	.043	.297	6.731	.000
Responsiveness	.313	.045	.291	6.908	.000
Privacy	.092	.040	.080	2.300	.022

Table 8 Summary of the Hypotheses Testing

Hypothesis	Accepted/Rejected
H1: UoB website **design** positively influences student's e-satisfaction.	Accepted
H2: UoB website **content** positively influences student's e-satisfaction.	Accepted
H3: Ease of use of UoB website positively influences student's e-satisfaction.	Rejected
H4: Reliability of UoB website positively influences student's e-satisfaction.	Accepted
H5: Responsiveness of UoB website positively influences student's e-satisfaction.	Accepted
H6: Privacy of UoB website positively influences student's e-satisfaction.	Accepted

universities' students are visiting various website with various designs and so they begin to compare between the different websites which imply that the website design is significant factor toward satisfaction (Al Shamayleh, Al Jaafreh, Al Jaafreh, and ALBadayneh, 2015).

H2: Concerning website content was accepted. Einasto (2014) and Allahawiah (2013) argued that the quality, clarity and relevance of information of the website has a direct positive effect on e- students' satisfaction which is similar to what the results of this research showed.

H3: Some studies in the literature indicated that ease of use is an important facet of users satisfaction that affect it directly (Shah and Attiq 2016; Al Shamayleh et al. 2015. However, in this research the result of testing this hypothesis does not support these studies in terms of it direct relationship to the users' satisfaction. Instead this research supports other studies that empathized that ease of use cannot lead to users' satisfaction unless they perceived that e-services are of high quality that can be determined by other factors of e-service quality. This point was the conclusion of Zeglat et al. (2016) and Santouridis (2009) who considered the ease of use as one dimension of e-service perceived quality that if it affects the perceived quality positively it will lead to customer satisfaction indirectly. Furthermore the same conclusion was derived by both Ardakani and Ardakani (2015) and Zaidi and Qteishat (2012) who approved that ease of use affect the users' satisfaction through perceived e-service quality.

H4: Concerning reliability was accepted. Iwaarden et al. (2003) stressed that reliability has a direct positive effect on perceived e-service quality and user satisfaction. In the literature it is heavily argued that the reliability has a direct positive effect on perceived students' satisfaction (Al Shamayleh et al. 2015; Yaghubia et al. 2014; Allahawiah 2013; Einasto 2014; Khattab Al and Fares 2011). Thus, the students are expecting to conduct their e-services with the university successfully without errors in the expected time so that they can be satisfied with the website quality.

H5: Al Shamayleh et al. (2015) found that responsiveness is positively and significantly related to student's satisfaction. This finding is consistent with studies by Yaghubia et al. 2014, Allahawiah 2013, Einasto 2014 and Khattab Al and Fares 2011. Thus, the students need to finish their e-services with the university promptly in a way that the website readily responds to their request guiding them to the appropriate actions if needed.

H6: Yang et al. (2005) examine the relationship between privacy and users satisfaction and indicated that the user's privacy is an important factors when user assess a website's service quality. In the context of university, Al Shamayleh et al. (2015) indicates that privacy affects students' satisfaction that is similar to the results of this research. Thus, any student involved in university e-services expect a high level of privacy so he/she feels safe about their information and not worry that his/her personal details to be violated or illegally exposed in any way. Therefore this factor is considered as an indicator to e-satisfaction

13 Conclusion, implications, limitations and future works

Nowadays, e-services such as enrolment, course delivery, course support, and library lending are rapidly becoming standards within the education sector (Sutarso and Suharmadi 2011). This research aims at measuring the quality of and its impact on student satisfaction at University of Bahrain (UoB). Toward this aim, a model named "model of e-QS measurement for UoB "was built by deriving different factors from literature review. The six factors undertaken were Web Design, Content, Ease of Use, Reliability, Responsiveness, and Privacy which impact on user satisfaction.

The results showed that the students of UoB perform different types of activities such as online registration, course evaluation survey, etc. depending upon their level of requirement and type of e-service provided. According to the factors affect e-satisfaction level of UoB students, it was found that a total 5 out of six factors: Web Design, Content, Reliability, Responsiveness, and Privacy to have significant effect whereas Ease of Use was found to have no significant effect.

Depending on the results of this study, the decision makers in the UoB should concern in enhancing the providing through university websites toward better student's e-satisfaction considering the five factors. Specifically, it recommended focusing on the following areas for better students' e-satisfaction:

- **Interface design** that should be easy to interact with and easy to navigate through to accomplish the desired tasks as expected.
- **Information Quality** so that information to be provided to students should be complete, accurate, concise and relevant and timeline.
- **Reliability** which impose them to have high level of commitment to ensure reliable, accurate and on-time services to students as it has a significant effect on their decisions during the study period.
- **Responsiveness** so that they should have the ability to provide prompt service to students through website when they have questions or problems and make them more comfortable specially in the critical process such as registration or critical time such as exam results.
- **Privacy** so that they have to show their students the degree to which the website is safe and their information is protected.

This research has many limitations. First, it did not consider the demographics background of the students such as their specialties that might affect their attitude towards using e-service which it turn affect their perception toward the five factors

included in the model. Thus, some of these factors can be included prior to the five listed factors within the model. Second, this study used the questionnaire as a quantitative tool where more in-depth perspective is needed for better website improvement. Therefore, qualitative data collection tools such as interviews or focus group discussions need to be deployed for more in depth analysis. This research could be a starting point that can be further developed for building an index for satisfaction for e-services for the whole country for the higher educational institutes at the Kingdom through which they can compete on the criteria.

References

Al Balushi, H., and Ali, S. (2016). Exploring the Dimensions of Electronic Government Service Quality. Available from: https://ksiresearchorg.ipage.com/seke/seke16paper/seke16paper_61.pdf.

Abd Rahman, N., & Ahmed, M. (2014). E-service quality in higher education and frequency of use of the service. *International Education Studies, 7*(3), 1–10.

Alhyari, S., & Alhyari, M. (2014). Toward quality measurement approaches for improving E-government services in Jordan. In Z. Mahmood (Ed.), *IT in the public sphere: Applications in administration, government, politics, and planning* (pp. 82–98). Hershey: Information Science Reference.

Agrawal, A., Shah, P., Wadhwa, V. (2008). EGOSQ e users' assessment of e-governance online: quality measurement instrumentation. Available from http:// www.csi-sigegov.org/1/24_361.pdf.

Allahawiah, S. (2013). Factors affecting the use of from user perspectives: A case study of Al-Balqa' applied university. *Journal of Management Research, 5*(2), 45–64.

Angell, R. J., Heffernan, T. W., & Megicks, P. (2008). Service quality in postgraduate education. *Quality Assurance in Education, 16*(3), 236–254.

Al Shamayleh, H., Al Jaafreh, R., Al Jaafreh, A., & ALBadayneh, D. (2015). Measuring the quality of e-services and its impact on students satisfaction at Jordanian universities. *Journal of Theoretical and Applied Information Technology, 74*(3), 274–285.

Ardakani, S., & Ardakani, M. (2015). A study about customer satisfaction of e-service quality of point of sale (POS). *Academic Journal of Economic Studies, 1*(2), 120–131.

Bauer, H. H., Falk, T., & Hammerschmidt, M. (2006). eTransQual: A transaction process-based approach for capturing service quality in online shopping. *Journal of Business Research, 59*(7), 866–875.

Bigne, E., Moliner, M. A., & Sanchez, J. (2003). Perceived quality and satisfaction in multi service organizations: The case of Spanish public services. *The Journal of Services Marketing, 17*(4), 420–442.

Campbell, D., & Fiske, D. (1987). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin, 56*(2), 81–105.

Carey, K., Cambiano, R. L., De Vore, J. B. (2002). Student to faculty satisfaction at a Midwestern university in the United States. In Conference Proceeding of Research and Development in Higher Education: Quality Conversations Vol. 25, July, 2002, 794 pages.

Cherry, K. (2016). What is reliability? [Online] About.com Health. Available at: http://psychology.about.com/od/researchmethods/f/reliabilitydef.htm [Accessed 15 April. 2017].

Cox, J., & Dale, B. G. (2001). Service quality and e-commerce: An exploratory analysis. *Managing Service Quality, 11*(2), 121–131.

Cronin, J. (2003). Looking back to see forward in services marketing: Some ideas to consider. *Managing Service Quality, 13*(5), 332–337.

Delone, W. H., Mclean, E. R., (2002), Information systems success revisited, Proceedings of the 35th Hawaii International Conference on System Sciences, Hawaii.

Einasto, O. (2014). Investigating e-service quality criteria for university library: A focus group study. *New Library World, 115*(1/2), 4–14.

Eisenhardt, K. (1989). Building theories from case study research. *Academy of Management Review, 14*(4), 532–550.

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.

Fornell, C., & Larcker, D. (1981). Evaluating structural equation models with unobservable variable sand measurement error. *Journal of Marketing Research, 18*(1), 39–50.

Francis J. E., & White L. (2002). PIRQUAL: A scale for measuring customer expectations and perceptions of quality in internet retailing. In *Proceedings of the Winter Educator's Conference, AMA*, (pp. 438–443). Chicago, IL: American Marketing Association.

Halaris, C., Magoutas, B., Papadomichelaki, X., & Mentzas, G. (2007). Classification and synthesis of quality approaches in e-government services. *Internet Research, 17*(4), 378–401.

Khattab Al, S. and Fares, F., (2011). Assessing Students' Satisfaction With Quality of Service of Students Information System, Management and Marketing Journal. [online] Available at: http://www.mnmk.ro/documents/2011/10_Iordania%20FFF.pdf.

Kim-soon, N., Rahman, A., & Ahmed, M. (2014). E-service quality in higher education and frequency of use of the service. *International Education Studies, 7*(3), 1–10.

Kim-Soon, N., Ahmed, M. (2012). Quality Performance of e-Service Supporting Learning, Research and Communication Uses, and Student's Frequency of Use: A Case in a Malaysian. Proceedings of the 2nd Annual International Conference on Education & e-Learning (pp. 217–224). Published and Organized by Global Science & Technology Forum, 17–18 September.

Kim, J., & Lee, J. (2002). Critical design factors for successful e-commerce systems. *Behaviour and Information Technology, 21*(3), 185–199.

Kotler, P., & Clarke, R. N. (1987). *Marketing for health care organizations*. Englewood Cliffs: Prentice-Hall.

Lee, H. S., & Kim, J. W. (2010). Student user's satisfaction with web-based information systems in Korean universities. *International Journal of Business and Management, 5*(1).

Lee, M. K. O., & Turban, E. (2001). A trust model for consumer internet shopping. *International Journal of Electronic Commerce, 6*(1), 75–91.

Lee, G. G., & Lin, H. F. (2005). Customer perceptions of eservice quality in online shopping. *International Journal of Retail & Distribution Management, 33*(2), 161–176.

Loiacono, E. T., Watson, R. T., & Goodhue, D. L. (2002). WEBQUAL: A measure of website quality. *Marketing Theory and Applications, 13*(3), 432–438.

Madu, C. N., & Madu, A. A. (2002). Dimensions of equality. *International Journal of Quality & Reliability Management, 19*(3), 246–259.

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*, 859–878.

Mckinney, V., Yoon, K., & Zahedi, F. (2002). The measurement of web-customer satisfaction: An expectation and disconfirmation approach. *Information Systems Research, 13*(3), 296–315.

Ojasalo, J. (2010). E-service quality: A conceptual model. *International Journal of Arts and Sciences, 3*(7), 127–143.

Oliver, R. L. (1997). *Satisfaction: A behavioral perspective on the consumer*. New York: Irwin/McGraw-Hill.

Oliveira, P., Roth, A., & Gilland, W. (2002). Achieving competitive capabilities in. *Technological Forecasting and Social Change, 69*(7), 721–739.

Nasirun, N. et al. (2012). Perceived web service quality for students' portal in higher learning institution. *International Proceedings of Economics Development and Research, 56*(2012), 52–56.

Papadomichelaki, X., & Mentzas, G. (2012). E-GovQual: A multiple-item scale for assessing egovernment service quality. *Government Information Quarterly, 29*(1), 98–109.

Parasuraman, A., Zeithaml, V. A., & Malhotra, A. (2005). E-S-QUAL: A multiple-item scale for assessing electronic service quality. *Journal of Service Research, 7*(3), 213–233.

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing, 61*(1), 12–40.

Park, Y. A., Gretzel, U., & Sirakaya-Turk, E. (2007). Measuring web site quality for online travel agencies. *Journal of Travel & Tourism Marketing, 23*(1), 15–30.

Saane, N., Sluiter, J., Verbeek, J. H., & Frings-Dresen, M. H. (2003). Reliability and validity of instruments measuring job satisfaction—A systematic review. *Occupational Medicine, 53*(3), 191–200.

Santos, J. (2003). E-service quality a model of virtual service dimensions. *Managing Service Quality, 13*(3), 233–247.

Santouridis, I. (2009). E-Service Quality and its Impact on Customer Satisfaction and Trust: An Empirical Study on Greek Customers of Internet Shops. 6th International Conference on Enterprise Systems, Accounting and Logistics (6th ICESAL '09) 18–19 May 2009, Thessaloniki, Greece – PROCEEDINGS - ISBN: 978–960–287-121-8.

Soares, A. M., & Simões, C. (2015). Applying to higher education: The role of information sources. In C. Campbell (Ed.), *Marketing in Transition: Scarcity, globalism, & sustainability. Developments in marketing science: Proceedings of the academy of marketing science*. Cham: Springer.

Shah, H., & Attiq, S. (2016). Impact of technology quality. *Perceived Ease of Use and Perceived Usefulness in the Formation of Consumer's Satisfaction in the Context of E-learning Abasyn Journal of Social Sciences, 9*(1), 124–140.

Stacie, P., DeLone, W., & McLean, E. (2006). Measuring information systems success: Models, dimensions, measures, and interrelationships. *European Journal of Information Systems, 17*(3), 236–263.

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.

Sutarso, Y., & Suharmadi, A. (2011). Promotion of e-technology-based services: A case study of e-service quality at a University in Indonesia. *International Journal of Business and Information, 6*(1), 112–133.

Tariq, I., Mahmood, A., Low, T and Jebur, H. (2013) A review of e-service quality dimensions in user satisfaction. In Proceeding of the International Conference on Research and Innovation in Information Systems (ICRIIS),27–28 Nov 2013, Skudai Malaysia.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education, 2*(2011), 53–55.

William, J. (2002). The student satisfaction approach: student feedback and its potential role in quality assessment and enhancement. 24th EAIR Forum, Prague, 8–11 September.

Wolfinbarger, M. F. and Gilly, M. C. (2002). comQ: Dimesionalizing, Measuring and Predicting Quality of the E-tail Experience. Working paper, Marketing science Institute, Cambridge, M.A., 01–100.

Iwaarden, V., Van der Wiele, B., & Millen, R. (2003). Applying SERVQUAL to web sites: An exploratory study. *International Journal of Quality & Reliability Management., 20*(8), 919–935.

Wolfinbarger, M., & Gilly, M. (2003). eTailQ: Dimensionalizing, measuring, and predicting retail quality. *Journal of Retailing, 79*(3), 183–193.

Yang, Z., Cai, S., Zhou, Z., & Zhou, N. (2005). Development and validation of an instrument to measure user perceived service quality of information presenting web portals. *Information Management, 42*(4), 575–589.

Yang, Z., & Fang, X. (2004). Online service quality dimensions and their relationships with satisfaction: A content analysis of customer reviews of securities brokerage services. *International Journal of Service Industry Management, 15*(3), 302–326.

Yang, Z., & Jun, M. (2002). Consumer perception of e-service quality: From internet purchaser and non-purchaser perspectives. *Journal of Business Strategies, 19*(1), 19–41.

Yaghubia, N., Chenijanib, A., & Shahraki, F. (2014). Study of student's e-satisfaction from of university. *Asian Journal of Research in Social Sciences and Humanities, 4*(11), 201–210.

Yoo, B., & Donthu, N. (2001). Developing a scale to measure the perceived quality of internet shopping sites (SITEQUAL). *Quarterly Journal of Electronic Commerce, 2*(1), 31–47.

Zaidi, S. F., & Qteishat, M. (2012). Assessing e-government service deliver (government to citizen). *International Journal of eBussiness and eGovernment Studies, 4*(1), 45–54.

Zeglat, D., Shrafat, F., & Al-Smadi, Z. (2016). The impact of the E-service quality of online databases on users' behavioral intentions: A perspective of postgraduate students. *International Review of Management and Marketing, 2016, 6*(1), 1–10.

Zeithaml, V. A. (2002). Service excellent in electronic channels. *Managing Service Quality, 12*(3), 135–138.

Zeithaml, V. (2000). Service quality, profitability and the economic worth of customers: What we know and what we need to learn. *Journal of the Academy of Marketing Science, 28*(1), 67–85.

Zeithaml, V. A., Parasuraman, A., & Malhotra, A. (2002). Service quality delivery through web sites: A critical review of extant knowledge. *Journal of the Academy of Marketing Science, 30*(4), 362–375.

Zhu, F. X., Wymer, W., & Chen, I. (2002). IT-based services and service quality in consumer banking. *International Journal of Service Industry Management, 13*(1), 69–90.