

## E-Satisfaction based on E-service Quality among university students

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**Abstract.** The importance of e-service and e-satisfaction in the education sector has increased nowadays due to the COVID 19 pandemic and most of the universities have shifted to electronic platforms to communicate with their students. Some studies had been conducted in Iraq and other developing countries to measure e-service and e-satisfaction in the education sector. the purpose of this study was to investigate the impact of e-service on e-satisfaction among undergraduate students. The survey was conducted at three private universities located in Erbil, Iraq. The study employed a convenience sample and the data was collected using questionnaires. Later, the questionnaire responses were analysed by AMOS after ensuring the validity and reliability of the model. The results showed that the responsiveness and privacy and security had a positive and significant effect on students' e-satisfaction. On the other hand, efficiency, reliability and ease of use had an insignificant impact on e-satisfaction among students. The results indicated that responsiveness was the most important factor and led to an increase in the e-satisfaction among students. As such, the decision-makers at universities should be concerned and work towards enhancing the responsiveness as well the privacy and security for students.

### 1. Introduction

Increasing the competition in the education sector provide several options to the students on which university that they would join [1]. Furthermore, universities are using the web portal to provide information as well as the services to students. As such, these higher learning institutions should pay more attention to the factors that lead to students' satisfaction to gain a competitive advantage in the highly competitive market nowadays [1,2]. Private and public universities have started designing their unique approaches focusing on their students and how to generate students' satisfaction in a competitive environment. In some universities, the presence of high-ranking universities has provided advantages with better quality and service argument than others [3]. Most of the previous studies were conducted in the business sector [8,9], banking sector [10] and limited studies in the education sector [1,2] particularly in Iraq.



Most of the universities nowadays have shifted from traditional teaching methods to the electronic method because of the COVID 19 pandemic. The services provided by universities have become electronic. As such, our study focused on e-services provided by Iraqi universities and students e-satisfaction regarding these services. The Iraqi universities suddenly found themselves forced to teach using electronic methods due to the COVID 19 pandemic. However, the Iraqi technology infrastructure could be considered weak compared to regional countries [4,6]. Thus, this issue negatively reflected students' satisfaction and performance. Before the COVID 19 pandemic, there was not much attention given to technology infrastructure at Iraqi universities. Furthermore, most of the university activities were conducting in the traditional way as opposed to the electronic way, such as course registration, tuitions fee payment and libraries.

According to Leonnard Leonnard [7], the e-services quality at the university included activities such as online course registration, course delivery, training, booksellers, payment confirmation, daily information and promotional programs and courses offered to prospective students.

The purpose of this study was to examine the impact of e-service quality dimensions on e-satisfaction among undergraduate students at Iraqi private universities.

## 2.Literature Review

### 2.1 E-Satisfaction

Satisfaction is defined as an affective state resulting from a transaction's affective and cognitive assessment process [11,12]. The decision is qualitative since the evaluation is a comparative method between the subjective perception and the original reference or comparable norm. Satisfied consumers continue to use service differently than those who are dissatisfied, and also are willing to recommend the product or service to their associates, family or friends [10].

E-satisfaction has been defined in various aspects. Jameel and Ahmad [11] refer to it as 'the contentment of a consumer concerning his or her prior purchasing experiences'. Most of the definitions reflect the three main components which are namely psychological, experiential and expected [13,14]. With the growing electronic acceptance for service delivery, it is important to assess the satisfaction of customers by monitoring and regulating the quality of those services [1].

E-satisfaction which is described as an evaluation of customer experience in internet retail contrasts with their experience with other online or conventional retail stores [15]. Confidence in the e-tailor will be increased with the specific application of the e-tailor. Thus, e-satisfaction is expected to have a direct and positive impact on trust. E-satisfaction among students refer to the services that are provided by the university to students such as course registration, electronic payment, smooth access to university portal and access to electronic library and the level of students' satisfaction regarding those activities. Satisfactory experiences of customers with a specific e-tailor should increase their willingness to shop from the e-tailor online and their confidence in the online medium [10].

### 2.2 E- Service Quality

E-service quality is defined as 'the extent to which a website facilitates efficient and effective shopping, purchasing and delivery of products and services' [16]. Consumers must rely on IT while using websites when they shop online [16,17]. This means the e-services aim to satisfy consumers 'needs without meeting them physically. E-service quality is an indication of an overall assessment of the customer and an assessment of the efficiency of the service delivered by the internet [18,19]. It is an important topic to understand the importance of consumer's value in online services [19]. Additionally, e-service quality represents 'the extent to which a website facilitates efficient and effective shopping, purchasing and delivery' [2]. E-service refers to a two-way mechanism in which marketers offer personalized goods and services on the basis of the information received from the potential consumers [20]. They add value to the information exchange offered by the internet [21].

### 2.3 E-Service Quality at the university system

The number of services offered to students using ICT has been growing especially during the COVID 19 crisis due to the postponement of students' attendance and lectures at universities. For improved connectivity between the universities and their students which lead to enhance the university's profitability and competitiveness, some researchers found that e-service quality played a vital role to enhance the market share and could be a critical success factor [2]. Ali [1] emphasized that focusing on the quality of e-service will produce many competitive benefits and improved operating efficiency and profitability. [22] highlighted the effect of quality on the appeal and retention of customers, which can improve client competitive online advantages. E-service had been measured in two different methods in the previous studies. The methods are the unidimensional method [10] and the multidimensional method [1,7,23]. However, most prior studies emphasized that multidimensional measurement led to a more accurate measurement of E-service quality. Currently, there was no consensus for specific dimensions measuring the e-service quality. Ali [1] measured the e-services quality in the education sector by six dimensions namely which comprised the web design, content, ease of use, reliability, responsiveness and privacy. Cobelli et.al [19] measured the e-services quality by the ease of use, entertainment, efficiency and system availability.

Alshamayleh et.al [23] measured the students' perception of e- services quality in selected universities in Jordan by seven dimensions (website design, reliability, responsiveness, privacy, ease of use, efficiency and availability. Another study also conducted in Jordan in selected universities found that students measured the e-service quality by information quality, system quality, user ability and services availability. The study conducted in Indonesia by Leonnard [7] in the education sector measured the e- services using efficiency, system availability, fulfilment and privacy. As mentioned above, there was no consensus among the researchers for elements measuring the e-service quality. The study selected the most common elements in studies conducted in regional countries and in the education system. This was because no study had been conducted in Iraq to measure the e-services quality and e-satisfaction in the education system particularly in the universities. The e-service quality would be measured using five elements such as the ease of use, reliability, privacy and security, responsiveness and efficiency.

### 3.Hypotheses development

Several prior studies confirmed the importance of e-service to improve and increase the e-satisfaction. Ghane et al [10] reported that better e- service quality led to more e-satisfaction and reported that e-service quality had a direct and indirect impact on e-satisfaction. Similarly, Behjati et al [8] reported that the e-satisfaction increased by the e-service quality. Kaya et al [9] found the direct effect of e-service quality on e-service. As mentioned previously, the e-service quality would be measured by five factors as the following.

#### 3.1 Responsiveness

This refers to the fast response when the technical issue happened or when the question needed to be answered as well as the opportunity to get technical support [23]. The students usually faced several issues regarding the university portal or website since most developing countries (Iraq in particular) had recently implemented the electronic system. However, most of the universities had not adopted the new system yet and the students always needed technical support from the universities. Responsiveness for students was considered necessary and this led to students' e-satisfaction. Ali [1] stated that students viewed responsiveness as an important element for e-satisfaction and reported responsiveness had a positive and significant impact on e-satisfaction. In the same education context, Alshamayleh et al [23] indicated that e-satisfaction was impacted by responsiveness among students in Jordan contest. Behjati et al [8] reported that responsiveness had a direct impact on e-satisfaction.

**H1: Responsiveness has positive and significant impact on e-satisfaction among undergraduate students.**

### 3.2 Efficiency

The website is user-friendly, well organized and requires minimal customer information [23]. Efficiency is usually linked to things like content, ease of use, and website protection [17,21]. Content and website updates are often referenced as determining factors to decide whether or not to buy online [21]. The efficiency that students looked for included information about course updating, course registration without technical issues, an easy to use website or university portal with smooth logging. The efficiency of the website and the university portal were considered vital factors to enhance the e-satisfaction of university students.

Empirically, efficiency had a positive and significant impact on satisfaction among Jordanian universities students [23]. Another study conducted among university students in the context of Indonesia found that efficiency had a significant impact on students' e-satisfaction [7]. while efficiency did not significantly impact on students' e-satisfaction [21]. The results of prior studies showed some inconsistency in the Iraqi setting. As such, the study proposed the following hypothesis.

**H2: Efficiency has positive and significant impact on e-satisfaction among undergraduate students.**

### 3.3 Reliability

This relates to the willingness of online retailers to deliver their commitments, follow the terms of the sale and deliver the goods as requested in compliance with their delivery time and service requirements [15]. Alshamayleh et.al [23] stated that the correct technical operation of the website and accuracy of service (with the delivery of the ordered, and delivery of product information when promised). Reliability was considered an essential factor of satisfaction if the customer did not trust the institution or organization. If the organization did not do what the customers requested, then they would be dissatisfied [24]. The reliability of e-services could lead to satisfaction or dissatisfaction among the students [23]. According to Alshamayleh et al. [23], reliability was important for students' satisfaction as when they surfed the university website, they expected to get what they wanted and they understood what they wanted with accurate service as well with the high level of reliability.

Empirically several studies emphasized that reliability played an important role to enhance and increase the e-satisfaction. Ali [1] reported that reliability led to e-satisfaction and had a positive and significant impact among students. Similarly, Alshamayleh et al [23] indicated the e-satisfaction was significantly impacted by reliability among university students. Behjati et al [8] indicated that reliability had an impact on e-satisfaction. On the other hand, reliability did not impact on e-satisfaction in the context of education [21]. There was no wide agreement for the impact of reliability on e-satisfaction. This study proposed to examine in the context of Iraq.

**H3: Reliability has positive and significant impact on E-satisfaction among undergraduate students.**

### 3.4 Ease of use

This refers to the search features of the web, speed of access, design elements and organization. considered ease of use, enjoyment and additional relationships to assess perceived e-service quality lead to increased customer satisfaction [19]. Online transactions can seem confusing and scare some customers. Thus, the ease of use of the website is an essential factor in the quality of e-service [15]. Ease of use as defined by Islam, Mok, Xiuxiu, and Leng [25] would be the students' understanding of how convenient the wireless internet service was to be used for learning and study.

Empirically there was an inconsistency in the results e.g. Ease of use was important for students' e-satisfaction and had a positive and significant impact according to the result reported by Islam et al [25]. Ease of use had a strong prediction on satisfaction [8,26]. Similar findings were reported by Bressolles et al. [15] on satisfaction impacted by the ease of use. On the other hand, ease of use did not impact on e-satisfaction among students in the context of Bahrain [1]. Another study conducted in several

Jordanian universities indicated that the ease of use had an insignificant impact on e-satisfaction among students. There was agreement regarding the impact of ease use on e-satisfaction. To solve this inconsistency in the context of Iraq, the study proposed the following hypothesis:

**H4: ease of use has positive and significant impact on e-satisfaction among undergraduate students.**

### *3.5 Privacy and Security*

Privacy and Security apply both to personal data protection and to the protection of the users against fraud risk and financial loss from credit cards or other financial information. Privacy applies to personal data security and the tacit or formal commitment not to sell or share personal information obtained from customers during the period of service [15]. This refers to the extent of the consumer's view about the web being free from infringement and secured personal information [23]. Websites were developed to enhance the consumers' protection from fraud and financial losses when using credit cards or other financial details [21]. Students are like any other consumers looking for his/her privacy and security when they are using the university portal as well the website. Security/privacy had a positive and significant impact on e-satisfaction and considered as the biggest impact on e-satisfaction [8,15]. Privacy played a vital role to enhance the e-satisfaction and had a positive and significant impact on e-satisfaction [1,20,23]. In line with previous findings, security showed the highest impact on satisfaction if compared to other e-service dimensions [26]. On the other hand, privacy did not impact on e-satisfaction among public and private universities in Indonesia [7]. [21] reported that privacy had an insignificant impact on e-service among students in the context of Jordan. The results of prior studies showed inconsistent findings. However, there was no study yet conducted in the Iraqi higher education system to find the impact of security and privacy on e-satisfaction. Thus, the study proposed the following hypothesis.

**H5: Privacy and Security has positive and significant impact on e-satisfaction among undergraduate students.**

## **4. Methodology**

### *4.1 Population and sample*

The population of this study comprised undergraduate students at three private universities located in Erbil, Kurdistan Region, Iraq. The students were selected based on a convenience sample and the questionnaires were indirectly recruited through e-mail and social media platforms by Google forms due to the COVID 19 pandemic as all the universities postponed the physical attendance in lectures. 300 questionnaires were distributed and 251 returned after checking the missing values and outliers. Only 246 questionnaires valid for analysis. The data was analyzed by SPSS for data descriptive and AMOS for hypotheses testing.

### *4.2 Instrument*

All the items had been adopted from prior studies. E-Satisfaction carried 9 items adopted from Leonard [7] and Rodríguez et al [14]. Ease of Use consisted of 6 items adopted from Bressolles et al. [15] and Trivedi and Yadav [27]. Reliability was measured by 8 items adopted from Rodríguez et al [14] and Al-dweeri et al. [21]. Privacy and security carried 10 items adopted from Leonard [7] and Rodríguez et al [14]. Lastly, efficiency carried 6 items adopted from Leonard [7] and Al-dweeri et al [21]. Additionally, the questionnaire consisted of the demographic questions as well the dependent and independent items. The responses utilized the five-point Likert scale ranging from strongly disagree to strongly agree.

### 4.3 Data sample

Most students were females (52%) and the rest were males (48%). Most of the respondents were students from 4<sup>th</sup> level (50%) and 27% from 2<sup>nd</sup> level. 9% and 14 % of the students were from the 1<sup>st</sup> and 3<sup>rd</sup> level respectively as seen in Table 1.

**Table 1.** Demographic Description

|               | Label                | N   | Percentage |
|---------------|----------------------|-----|------------|
| Gender        | Male                 | 117 | 48%        |
|               | Female               | 129 | 52%        |
|               | Total                | 246 | 100%       |
| Year of Study | 1 <sup>st</sup> Year | 23  | 9%         |
|               | 2 <sup>nd</sup> Year | 67  | 27%        |
|               | 3 <sup>rd</sup> Year | 34  | 14%        |
|               | 4 <sup>th</sup> Year | 122 | 50%        |
|               | Total                | 246 | 100%       |

N 246

## 5.Data analysis

There were two main steps which should be conducted when using AMOS. Firstly, one should utilize the measurement model. Next, one should utilize the structural model [28].

### 5.1 Measurement Model

The main aim of this step was to measure the validity and reliability of the model. For this step, one should measure the factor loadings, composite reliability and average variance extracted (AVE) [29,30].

The factor loadings of items should exceed the cut off level of 0.6 [28]. Some items showed low loadings of less than 0.6. Thus, this was removed to enhance the model reliability and fit indices. For example, three items were removed from e-satisfaction removed (ES1, ES3 and ES5). Additionally, two items were removed from the ease of use (EU1 and EU2). Three items were also removed from reliability (RE1, RE4 and RE6). The variables privacy and security showed three items with poor loadings (PAS1, PAS 8 and PAS9) and they were removed. Lastly, one item each was removed from the responsiveness and efficiency variables. (RES1 and EFF1). Thus, all the other items exceeded the cut off level of 0.6.

To ensure the internal consistency for variables, Hair et al [28] suggested that one should measure the Composite Reliability (CR) with the cut off level of 0.70. All the variables reflected high internal consistency and exceeded the value of 0.70. Concerning AVE, all the variables AVE exceeded the recommended level of 0.5 [28]. Thus, the validity and reliability of model had been achieved.

**Table 2.** Validity and Reliability

| Variables      | Items | Loading >0.6 | CR >0.7 | AVE >0.5 |
|----------------|-------|--------------|---------|----------|
| E-Satisfaction | ES2   | .784300      | 0.941   | 0.729    |
|                | ES4   | .896570      |         |          |
|                | ES6   | .918008      |         |          |
|                | ES7   | .805581      |         |          |
|                | ES8   | .909271      |         |          |
|                | ES9   | .797659      |         |          |
| Ease of Use    | EU3   | .739234      | 0.849   | 0.631    |
|                | EU4   | .801787      |         |          |
|                | EU5   | .831836      |         |          |
|                | EU6   | .800650      |         |          |

|                      |       |         |       |       |
|----------------------|-------|---------|-------|-------|
| Reliability          | RE2   | .718905 | 0.765 | 0.663 |
|                      | RE3   | .885591 |       |       |
|                      | RE5   | .951627 |       |       |
|                      | RE7   | .793586 |       |       |
|                      | RE8   | .690094 |       |       |
| Privacy and Security | PAS2  | .826202 | 0.933 | 0.665 |
|                      | PAS3  | .835988 |       |       |
|                      | PAS4  | .769831 |       |       |
|                      | PAS5  | .838474 |       |       |
|                      | PAS6  | .815444 |       |       |
|                      | PAS7  | .880811 |       |       |
|                      | PAS10 | .731821 |       |       |
| Responsiveness       | RES2  | .759409 | 0.724 | 0.526 |
|                      | RES3  | .743419 |       |       |
|                      | RES4  | .659190 |       |       |
|                      | RES5  | .719448 |       |       |
|                      | RES6  | .740886 |       |       |
|                      | EFF2  | .672945 |       |       |
| Efficiency           | EFF3  | .674415 | 0.754 | 0.624 |
|                      | EFF4  | .931229 |       |       |
|                      | EFF5  | .757911 |       |       |
|                      | EFF6  | .878388 |       |       |

### 5.2 Model fit

Table 3 illustrated the model fit indices. All the indices had been achieved except GFI which was less than 0.9. According to Awang [30] and Hair et al. [31], if at least three of the indices were achieved, the researcher could proceed with the analysis. After achieving the model fit, the next step was to measure the structural model.

**Table 3.** Model fit Indices

| Fit Index          | Recommended Criteria | Sources | Results |
|--------------------|----------------------|---------|---------|
| x <sup>2</sup> /df | ≤5                   | [31]    | 1.325   |
| RMSEA              | < .08                | [32]    | .055    |
| TLI                | ≥.90                 | [31]    | .936    |
| AGFI               | ≥.80                 | [31]    | .802    |
| CFI                | ≥.90                 | [33]    | .941    |
| GFI                | ≥.90                 | [34]    | .829    |

### 5.3 Structural Model

This step aimed to find the impact of independent variables on the dependent variable. The P- value should be less than 0.05 and the T- value (CR) should be higher than 1.96 [28].

The first hypothesis measured the impact of responsiveness on e-satisfaction among the students. The result indicated the p-value <0.05 and the t-value 2.72 was greater than 1.96. Thus, H1 was accepted.

The second hypothesis indicated that the efficiency did not impact on the e-satisfaction among students due to the p-value .604 < 0.05 and the t-value .518 < 1.96. This result led to the rejection of H2.

The third hypothesis proposed to find the impact of reliability on e-satisfaction and the findings indicated that the reliability was not affected due to the p-value .102 > 0.05 and the t-value 1.63 < 1.96. Thus, H3 was rejected.

The fourth hypothesis measured the impact of ease of use on e-satisfaction and the result showed the ease of use had insignificant impact on e-satisfaction due to the p-value > 0.05 and the t-value < 1. Thus, H4 was rejected.

The fifth hypothesis confirmed the impact of privacy security on e-satisfaction among the students. The p-value  $0.0206 < 0.05$  and the T-value  $> 1.96$ . Thus, H5 was accepted.

**Table 4.** Hypotheses Test

| Hypotheses |                |                        | Estimate | S.E.  | C.R.   | P     | Label    |
|------------|----------------|------------------------|----------|-------|--------|-------|----------|
| <i>H1</i>  | E Satisfaction | <--- Responsiveness    | .2251    | .0827 | 2.7200 | .0065 | Accepted |
| <i>H2</i>  | E Satisfaction | <--- Efficiency        | .0391    | .0755 | .5185  | .6040 | Rejected |
| <i>H3</i>  | E Satisfaction | <--- Reliability       | .1015    | .0621 | 1.6337 | .1023 | Rejected |
| <i>H4</i>  | E Satisfaction | <--- Ease of Use       | .0051    | .0614 | .0833  | .9335 | Rejected |
| <i>H5</i>  | E Satisfaction | <--- Privacy -Security | .1540    | .0665 | 2.3145 | .0206 | Accepted |

## 6. Discussion

The purpose of this study was to investigate the impact of e-service quality dimensions on e-satisfaction. Responsiveness was indeed essential and had a significant impact on students' e satisfaction. This could be seen in the study conducted by Ali [1] and Alshamayleh et al. [23]. This meant that the students' e-satisfaction increased when they received fast response from the technical support team and when they were facing technical issues or when they had questions regarding their issues. Besides, when the students visit the university website, they expected their transactions to end quickly and a fast response when they needed assistance.

The efficiency had insignificant impact on students e-satisfaction as reported by Al-dweeri et al. [21], This meant that the students in the Iraqi context did not pay much attention to the user-friendly feature of the website and the content or updates. This result may reflect the fact that in Iraq, most of the universities had not implemented the electronic system such as online course registration, online payment of tuition fee and other activities. Most of the Iraqi universities were still using the traditional way. The e-satisfaction was not impacted by reliability among students and this was consistent with previous studies [21].

The result indicated that students did not pay attention to the reliability factor. The reliability of the site or the portal was not important for students. This may be due to the university website or portal not reflecting the commercial task and the students were mainly using the university website for education purposes and not for buying items.

The ease of use had insignificant impact on students' e-satisfaction. This result was supported by Ali [1]. The result showed that the students did not have enough experience to use the technology tools as well as the PC and internet. As such, they did not feel that the ease of use could. increase their e-satisfaction.

The protection of privacy and security is essential for the website and it is an important point to all users including the students. The high privacy and security for the website and the university portal can increase the students e- satisfaction. It is critical to protect the students' privacy and the secure transmission of the information when students assess the quality of service on the website. This study result was in line with a few studies [8,15].

## 7. Conclusion, Implication and Limitations

E-services at universities such as course registration and delivery, course support and e-libraries are becoming necessary in the education sector especially during the COVID 19 crisis. The study aimed to find the impact of E-services factors on E-satisfaction among undergraduate students. The e-service is measured by five factors developed from the literature review. The results indicated that responsiveness was the most important factor and led to increased e-satisfaction among the students. The next factors were privacy and security. The decision-makers at the universities should be concerned and work to enhance the responsiveness as well the privacy and security for students.

The theoretical implication of this study was to enrich the body of knowledge in the context of Iraq and other developing countries. Additionally, the practical implication indicated that responsiveness was

more important to improve the e-satisfaction among students. Besides, the decision-makers at universities were advised to enhance the responsiveness and privacy and security.

The study had some limitations like any other study. Firstly, the study was conducted among three private universities only and used a convenience sample technique which may not be suitable for generalizing the results to other universities. Secondly, the study examined the direct effect without examining the causal effect.

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