Quality of IT Enabled Services in Higher Education Institutions in Saudi Arabia

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Keywords: quality of education, quality of IT enabled services, education Saudi Arabia.

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QUALITYOFITENABLED SERVICESINHIGHER EDUCATIONINSTITUTIONSINSAUDIARABIA

Strictly as per the compliance and regulations of:

Quality of IT Enabled Services in Higher Education Institutions in Saudi Arabia

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Abstract- The delivery of education has improved over time by using the IT enabled services, especially in the higher education institutes. The role of the IT enabled services to disseminate effective teaching has increased over time and still improving with a great pace with emerging needs of the students and the teachers. This research paper is focused to identify and investigate the quality of IT enabled services in the higher education institutes in Saudi Arabia. The study was conducted at two model higher education institutions from public and private sector. Mixed research method has been used to attain the information and to identify the convergence of the information. It was identified that the quality of IT enabled services in better in the public sector institution ascompared to the private sector institution.

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I. Introduction

Access to education is a fundamental right of each child and making this access better is an obligation of the government. The emergence of IT and its utilization in the education sector has helped the students at all levels, to improve their capability to learn and without need to memorizing text but by learning the conceptual grounds and theories. Thus, IT has played its role in making the teaching and learning, not only interesting but also effective in the recent years. The role of IT Enabled Services (ITES) has been vital in the higher education institutes as well and now, as the baseline of the ITES has been established at most institutes it is becoming important to evaluate the quality of ITES at different institutes. In this paper, we focus on two higher education institutions from public and private sector. We have chosen universities in Saudi Arabia as the study is focused to make a comparison of the ITES in Saudi universities.

Considering the nature of the study, two leading universities, one each from government and private sector was selected to participate in the study as they exist in same city. The public sector university (referred as A in the rest of this paper)was established in the fifties and is one of the oldest university in the kingdom while the private sector university (referred as B in the rest of this paper) was established in the nineties. It is also important to mention that the current student enrolment at the private university is around 3,500 while the public sector university has 10 times mores enrolment, and so is the ratio in the staff of the universities. The purpose of this study is to compare the state of the ITES in the Saudi universities.

II. Literature Review

In order to compare the state of the art it is important to establish the parameters based on which the comparisons among the universities can be made for the quality of ITES. Some recent work has been carried out in this domain which is presented in the this section. Several researchers [1][2][3][4][5], including Alanezi and Yang have mentioned that the 'Accessibility' factor is vital in nature for measuring the quality of ITES. Tan and Burgess [5][1][4] have advocated the need for customization as a major player in the quantification of the ITES for the higher education while Parasuraman and George[1][6][2][7] are of the view that delivery of teaching and the efficiency of the ITES is also important.

Alanezi, Lin, Sedera and Swaid[1][8][9][10] have identified the importance and have advocated the existence of the factors like functionality and information quality. Both these factors form the core of ITES and are valuable in their nature and existence. Zeithaml [2] has found that some factors like response time, service usability, system integrity and trust are important factors in the quantification of the quality measurement. These factors govern the environmental factors and responsiveness of the system and are vital to measure the quality of the system instead of functionality of the system. Tan, George and Burgess [1][4][7] have advocated the presence of security as an integral factor to measure the quality of ITES. Apart from that, some researchers like Burgess [5] have considered that the factors like site design, service usability and service reliability have a great value in the measurement of the quality of the ITES. Aziz [11] in her research shortlisted these seventeen items to evaluate the quality of the ITES in the higher education. The shortlisting was done from more than 100 elements based on the recurrence, relevance and importance which was determined by the expert opinion. The factor, its description and the citation of the survey is given in Table 1.

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Table 1 : Factors to measure ITES quality

No	Factor	Description	
1	Accessibility	Accessibility is the degree to which the user can access the required service	[1][2][3][4][5]
2	Customization	The ability to configure the ITES according to requirement	[5][1][4]
3	Delivery of teaching	It deals with the ways and quality of the teaching.	[7]
4	Efficiency	How quickly the required services are available.	[1][6][2][7]
5	Functionality	It describes that what specific tasks can be performed by using the system	[1][8]
6	Information quality	By what level the available information suits the user.	[9][10]
7	Interoperability	Access to multiple service	[4]
8	Privacy	The level to which a person is secure in performing his tasks without being public.	[7][6][1]
9	Response time	The time between the request and availability of the information	[2]
10	Security	Security factor reflects the adequacy of security features implemented in the ITES.	[7][1][4]
11	Service reliability	Service reliability is the percentage of time the ITES is available for use without failure.	[5]
12	Service usability	Service usability factor refers to the degree to which the users find it easy to use the various ITES.	[2]
13	Site design	Site design factor measures the quality of site design in terms of user satisfaction and ease of use.	[5]
14	System integrity	The provision of consistent information at all times.	[2]
15	Trust	How reliable, efficient and responsive a system is.	[2]
16	Usefulness	Usefulness is the degree to which the users find it easier to do their work via the ITES.	[5]
17	User support	User support factor refers to the degree to which the ITES department personnel are willing to serve the users in case their help and support is required.	[3]

The findings by Aziz [11] form the basis of this study. The findings are contemporary in nature and discuss an evolutionary paradigm of emerging state of the art from the authors of immense repute [12, 13]. Ahead of this a considerably sound and current methodology to affirm the findings was used that increase the trust to use this findings of the publication as a base of this research.

III. Methodology

This study is a mixed method research [14, 15], that has been completed by triangulating the qualitative and quantitative results. The survey was conducted on 300 individuals in each institute and the results were collected. The purpose of the survey was to ask the users about the quality of IT enabled services at their respective institute, against the different factors attained after the comprehensive literature review. Likert scale [16] was used to rank the responses on a scale of 1-5, i.e. from poor to excellent, hence, the column 1 in each response list has the weightage 1, the 2nd column has the weightage 2 and column 3 has the weightage of 3 and so on. Once the sums are accumulated they are divided by the number of total respondents to get the weighted average and this activity is run for both institutes separately. After that the comparison among the results is made by considering each factor to identify that in which area a specific institute is performing better. A qualitative study has been conducted on the same lines where four respondents were interviewed (two from each university) and were asked to identify the standards of the IT enabled service in their respective institutes based on the factors and considering the cotemporary situations[17-24]. In this research we follow the partially mixed sequential dominant status paradigm where the qualitative findings follow the quantitative findings and are dominant. This paradigm is followed in research studies that are centric to evaluate the technology education [25-31].

IV. Quantitative Study

Considering the scale of the survey it is important to maximize the responses, however it is notable that the responses have to be precise and should come from the experienced users[17, 32]. In order to achieve this the means given in Table 2 are used to spread the survey and collect the responses. The effectiveness of these means is given in Table 3 while Figure 1 illustrates the spread of survey call.

Table 2 : Means of Sending Survey and responsiveness

No.	Mean of	Count	Responses	%
1	Paper	10	10	*100*
2	Web Link	500	398	*80*
3	Skype Text	20	10	*50*
4	Google Talk	50	30	*60*
5	Phone call	60	40	*67*
6	Text	40	36	*90*
7	Facebook	96	64	*67*
Total		776	588	*75*

Table 3 : Effectiveness of each mean by percentage

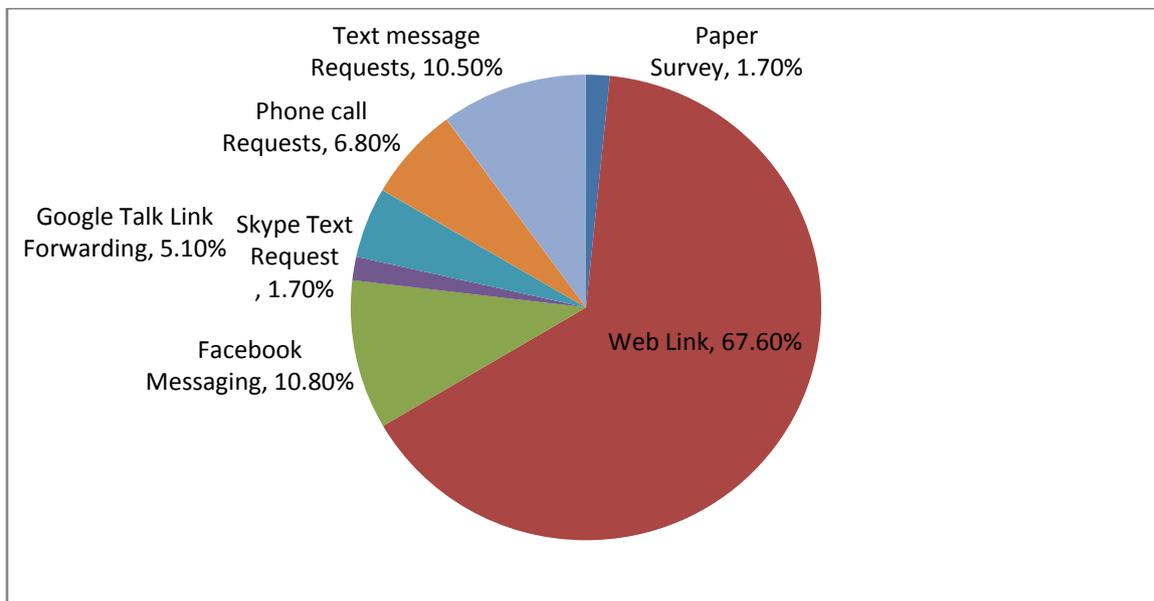| No.	Mean of Sending Survey	Count	Responses	Average Response
1	Paper Survey	10	10	*1.7%*
2	Web Link	500	398	*67.6%*
3	Skype Text Request	20	10	*1.7%*
4	Google Talk Link Forwarding	50	30	*5.1%*
5	Phone call Requests	60	40	*6.8%*
6	Text message Requests	40	36	*6.12%*
7	Facebook messaging	96	64	*10.8%*

Figure 1 : Proportionate spread of the survey call

The Survey reached to 776 while 588 out of them responded. Following statistics in Table 4 are used for this survey.

Table 4 : Statistics for the survey conduct

Measure	Number
Confidence Level	99%
Confidence Interval	3
Population accessed	776
Sample Size	548
percentage	50

The actual population size is unknown [9]

Confidence level demonstrates the level of confidence that we have on the response to be correct and precise. Usually a confidence level of 95% is used in the research although 99% is used. The confidence interval determines the amount of acceptable results, and is always presented with the ± symbol. If the threshold value is 67 and the confidence interval is 5, it will allow considering values from 62-72 as legitimate. Since the survey has been conducted in two different institute to compare the state of the art of IT enabled services, almost half of the responses came from each institute. A 5-level Likert scale has been used in this research that ranges from poor to excellent. The range is from 1-5 on a quantitative scale. The value for poor is 1 and value for excellent is 5. Every response that choses the 'poor' against some item is multiplied by 1 while the selections like 'somewhat acceptable' is multiplied by2, the choice 'acceptable' is multiplied by 3, the choice 'very good' is multiplied by 4, and the choice 'excellent' is multiplied by 5. The average weighted response is achieved by divining the weighted response over the total number of respondents. It is further important that some questions were not answered by some individuals. For institute A, 261 respondents have responded while some 325 respondents responded for the institute B.

Table 5 : Survey response statistics from institute A

Items	Poor	Somewhat Acceptable	Acceptable	Very Good	Excellent	Average Weighted Response
Accessibility	0	42	270	492	135	3.60
Customization	0	48	972	1584	315	3.41
Delivery of teaching	3	24	252	504	90	3.59
Efficiency	0	36	216	516	180	3.72
Functionality	0	30	278	384	255	3.67
Information quality	3	36	234	504	165	3.65
Interoperability	3	42	331	384	90	3.78
Privacy	3	36	341	492	105	3.88
Response time	3	24	261	456	165	3.65
Security	0	42	243	420	90	3.53
Service reliability	0	24	234	336	165	3.67
Service usability	0	24	297	348	225	3.68
Site design	0	6	234	552	120	3.75
System integrity	0	36	279	456	105	3.56
Trust	0	42	405	348	75	3.37
Usefulness	0	30	297	372	210	3.65
User support	0	36	252	348	225	3.68

Table 6 : Survey response statistics from institute B

Items	Poor	Somewhat acceptable	Acceptable	Very Good	Excellent	Average Weighted Response
Accessibility	12	102	531	312	75	3.17
Customization	0	126	540	228	75	2.94
Delivery of teaching	42	120	531	156	15	2.69
Efficiency	9	132	495	216	120	3.06
Functionality	6	138	504	288	75	3.06
Information quality	21	72	414	384	150	3.24
Interoperability	30	96	432	264	120	3.02
Privacy	24	138	177	120	75	1.70
Response time	9	108	477	288	135	3.17
Security	18	132	468	228	120	3.01
Service reliability	18	138	468	204	75	2.92
Service usability	24	108	441	288	60	2.98
Site design	21	144	477	192	90	2.91
System integrity	18	180	450	168	60	2.81
Trust	6	150	432	264	135	3.10
Usefulness	18	144	495	204	75	2.92
User support	12	144	468	228	90	2.99

Table 7 : Comparison of Institute A and B for quality of ITES

Items	AWR (Average Weighted Response) Somewhat acceptable		Better on Quantitative Scale
	Institute A	Institute B	
Accessibility	3.60	3.17	Institute-A
Customization	3.41	2.94	Institute-A
Delivery of teaching	3.59	2.69	Institute-A
Efficiency	3.72	3.06	Institute-A
Functionality	3.67	3.06	Institute-A
Information quality	3.65	3.24	Institute-A
Interoperability	3.78	3.02	Institute-A
Privacy	3.88	1.70	Institute-A
Response time	3.65	3.17	Institute-A
Security	3.53	3.01	Institute-A
Service reliability	3.67	2.92	Institute-A
Service usability	3.68	2.98	Institute-A
Site design	3.75	2.91	Institute-A
System integrity	3.56	2.81	Institute-A
Trust	3.37	3.10	Institute-A
Usefulness	3.65	2.92	Institute-A
User support	3.68	2.99	Institute-A

V. Qualitative Study and Triangulation

Table 5 and Table 6 summarize the survey response statistics from institute A and B respectively. The results shown in Table 7 , clearly demonstrate that the quality of ITES is better in institute A as compared to institute B in all the factors. Considering these results a qualitative study was formulated where four interviews were conducted to gain an insight of the ITES in the respective institutes. The outcome is given in Table 8. Along with the illustrative description of the ITES quality items, the interviewees preferred to give the absolute numbers in measuring the quality. Four interviews were conducted in total Two interviews were conducted in institute A while rest two were conducted at institute B. The summary of the results is presented in Table 8 which clearly demonstrates that the interviewees (like the survey respondents) believed that the quality of ITES is better in institute A as compared to institute B. In the survey, institute A was observed having lead in the quality factors while in the interviews institute A leads in 12 out of 17 factors, equal in 4, and lags in 1 factor. Figures 2 and 3 depict the quantitative and qualitative analysis respectively.

Table 8 : Outcome of the 4 interviews

| Items	Qualitative Response		Better on Quantitative Scale
	Institute A	Institute B	
Accessibility	4	3.5	Institute-A
Customization	3.5	3.5	-
Delivery of teaching	3	2.5	Institute-A
Efficiency	4	2.5	Institute-A
Functionality	3.5	3.5	-
Information quality	4	3.5	Institute-A
Interoperability	4.5	3	Institute-A
Privacy	4	2.5	Institute-A
Response time	3	3.5	Institute-B
Security	4	2.5	Institute-A
Service reliability	4.5	3	Institute-A
Service usability	4	3.5	Institute-A
Site design	4	3	Institute-A
System integrity	4	2.5	Institute-A
Trust	3.5	3.5	-
Usefulness	3.5	3.5	-
User support	4.5	3.5	Institute-A
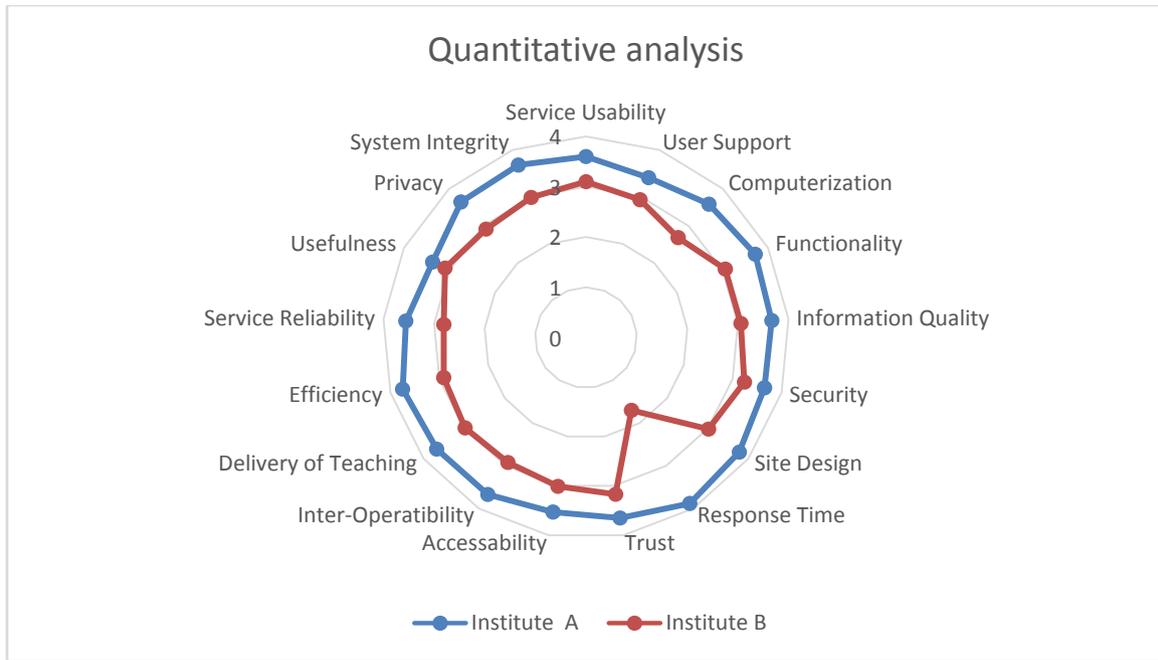
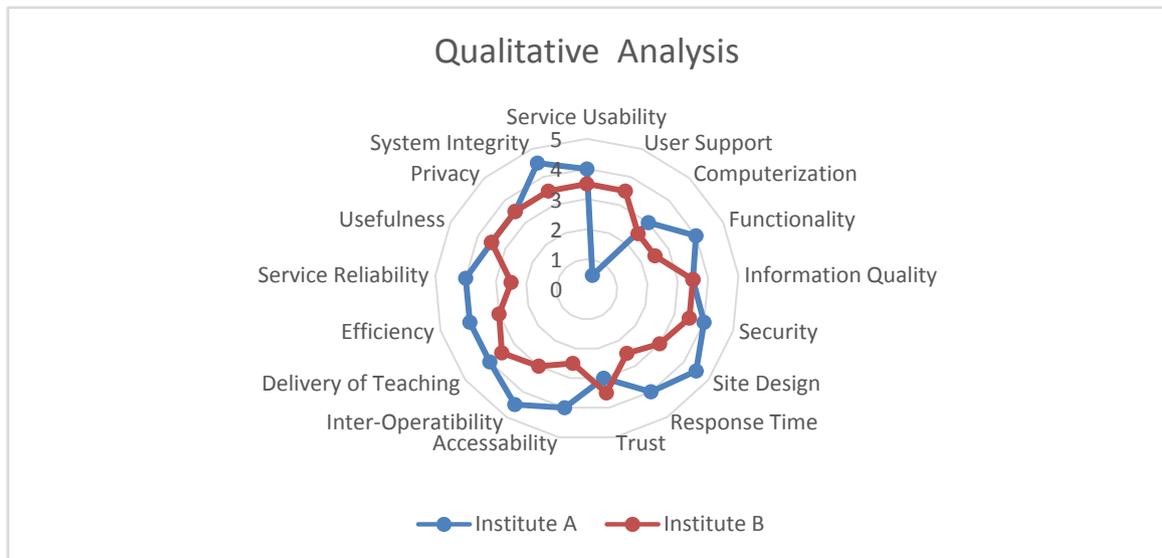*Figure 2 :* Quantitative analysis of ITES

Figure 3 : Qualitative analysis of ITES

In triangulation process, it is observed that whether the findings of the qualitative method and the quantitative methods converge to similar results? The triangulation process is shown in Table 9.

Table 9 : Triangulation of Qualitative and quantitative results

Items	AWR Somewhat acceptable		Better on Quantitative Scale			Better on Qualitative Scale	Triangulation Results
	Institute A	Institute B		Institute A	Institute B		
Accessibility	3.60	3.17	Institute-A	4	3.5	Institute-A	Institute-A
Customization	3.41	2.94	Institute-A	3.5	3.5	Equal	Equal
Delivery of teaching	3.59	2.69	Institute-A	3	2.5	Institute-A	Institute-A
Efficiency	3.72	3.06	Institute-A	4	2.5	Institute-A	Institute-A
Functionality	3.67	3.06	Institute-A	3.5	3.5	Equal	Equal
Information quality	3.65	3.24	Institute-A	4	3.5	Institute-A	Institute-A
Interoperability	3.78	3.02	Institute-A	4.5	3	Institute-A	Institute-A
Privacy	3.88	1.70	Institute-A	4	2.5	Institute-A	Institute-A
Response time	3.65	3.17	Institute-A	3	3.5	Institute-B	Institute-B
Security	3.53	3.01	Institute-A	4	2.5	Institute-A	Institute-A
Service reliability	3.67	2.92	Institute-A	4.5	3	Institute-A	Institute-A
Service usability	3.68	2.98	Institute-A	4	3.5	Institute-A	Institute-A
Site design	3.75	2.91	Institute-A	4	3	Institute-A	Institute-A
System integrity	3.56	2.81	Institute-A	4	2.5	Institute-A	Institute-A
Trust	3.37	3.10	Institute-A	3.5	3.5	Equal	Equal
Usefulness	3.65	2.92	Institute-A	3.5	3.5	Equal	Equal
User support	3.68	2.99	Institute-A	4.5	3.5	Institute-A	Institute-A

VI. Discussion

There are 17 factors for measuring the quality of ITES in the institutes in Saudi Arabia. Two intuitions, one government and one private university was selected for this purpose in the capital city of Riyadh. The results of the study demonstrate that the quality of the ITES is better in institute A as compared to B. After the completion of the triangulation process the results have not changed much from the initial process, since the findings were very much consistent in the quantitative and qualitative methods. For the factors like 'accessibility', 'delivery of teaching', 'efficiency', 'information quality', 'inter-operability', 'privacy', 'security', 'service reliability', 'service usability', 'site design', 'system integrity', and 'user support' the results of the qualitative and quantitative findings were same. For the factors 'customization', 'functionality, 'trust', and 'usefulness'. the qualitative findings are different from the quantitative findings where in the survey it was established that the institute A is better as compared to institute B but in the interview it was established that both institutes have same standing. It was mentioned in the methodology section that the qualitative findings will have the dominance on the quantitative findings, therefore the qualitative results are observed in case of a disagreement among the qualitative and quantitative findings. Since the results of the qualitative finding demonstrate that the state-of-art of two institutions for these four factors is not different therefore the qualitative findings hold. For one factor 'response time' in the quantitative findings it was observed that the institute A is better in comparison while the results of the qualitative findings are otherwise, but for the reasons mentioned above, the qualitative results are held.

VII. Conclusion

It can be summarized that the in order to compare the state-of-art of ITES in Saudi universities 17 factors were identified. Two institutions were compared based on quantitative and qualitative data, and the results have shown that institute A leads with better score on 12 factors while for four factors the scores were equal, while institute B leads only in one factor. It can be concluded that the state-of-art of ITES is much better in institute A as compared to institute B. Institute B needs to be more concerned in improving the quality of the ITES, especially in the areas of accessibility, information security, privacy, and user support. While Institute A needs to improve in customization, usefulness, response time, and trust.

VIII. Acknowledgement

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