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THE EQUAL APPROACH TO ASSESS THE EFFECTIVENESS OF ELECTRONIC SERVICE QUALITY IN CENTRAL LIBRARY (CASE STUDY: FERDOWSI UNIVERSITY OF MASHHAD)

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Abstract

By increasing the use of electronic library services, service quality assessment has become increasingly important for all academic libraries. The aim of this study is to evaluate the effectiveness of electronic services quality based on the three-dimensional scale of eQual (quality of information, quality of service interaction, usability) in the central library of Ferdowsi University of Mashhad in terms of graduate students' viewpoints. The method of this research is descriptive-survey. The statistical population includes all graduate students in 2019. The stratified random sampling method is used in this research. The validity of questionnaire is approved by experts and its reliability is %89 by using Cronbach 's coefficient method. In this research, we have tried to answer the question of whether the quality of electronic services of central library in three dimensions of quality of information, quality of service interaction and usability is effective by the view of postgraduate students. The results of one-sample t-test in response to this question indicates that the quality of electronic services was modest in relation to the dimensions of service interaction and services usability and it was less than the average in relation to the quality of information dimension. Finally applicable relevant suggestions are presented to improve the effectiveness of the quality of electronic services.

Keywords: Quality of Information, Quality of Service Interaction, Usability

Introduction

The academic role of libraries in various communities is to improve the quality of education, research, teaching, learning and comprehensive development of all countries. It is nearly about half a century that by recognizing this importance, the academic libraries have attempted to measure the effectiveness of their services quality to users through different ways (Bawden, D., et al, 2005). One of the most prominent researches in this field is a research conducted by the Association of Research Libraries, which spent 7.2 billion US dollars for assessment of library services quality of its 122 member libraries between 1998-1999 (Kyrillidou and Ot Connor, 2000). The optimal operation and libraries services quality facilitate the achievement of the scientific and cultural goals of the community (Hariri,najla.2002). If each library, as a center for meeting the information needs, fully understands the needs of users, they can reduce unnecessary budgets by making timely decisions, and make the necessary changes to improve the quality of services and the delivering methods. Appreciating and maintaining relationship with the users' community and meeting their needs is one of the most important tasks of academic libraries. (Zamani, allah dadian .2007)

Ferdowsi University of Mashhad with six decades of educational experience and research and more than 150 PhD and master programs, is the massive pole of scientific and cultural index of higher education in the North East of Iran (Ferdowsi

University, 2013). Position of the Information Center and the Central Library for offering scientific and specialized information is outstanding. Development of different fields of study and the increasing number of graduate students and the need to quickly access to scientific and research resources for the preparation and compilation of research reports, has made central library of the university as the main provider of information resources needed to develop technical and specialized knowledge of users, and so it needs to be up-to-date and meet the growing needs of users quantitatively and qualitatively (Fatahi, Rahmatollah, 1998). The central library's objectives are to provide and organize accessible scientific information resources required for the promotion of education and research (Ferdowsi University,2011).

Websites as a communication network and information highway in the world, have created extensive opportunities for libraries, to provide faster and more efficient services to meet the information needs of library users. On the other hand, increasing interest of users to internet in order to access updated information has attracted the attention to library administrators too. Paying attention to opinions of the user community is an important factor in an information system (Zamani, Allahdadian, 2007). When we are faced with a variety of tasks and demands, service units encounter numerous problems (Katler, Armstrang, 2000). Effectiveness is the simpler concept of being able to achieve a desired result (Rezaeian, 2006:178). In other words, the effectiveness indicates that to what the extent of the efforts, expected results have been achieved (Kazemi, & Abtahi, 2000). Evaluation is the only tool that is able to measure the effectiveness of electronic services quality in academic libraries. The meaning of effectiveness of library services quality has become closer to the ultimate goal and satisfies the users' needs (Oloomi 1997). With this great transformation in the way electronic services are provided, the method of measuring the effectiveness of this type of service has changed too, and new indicators and models are needed to measure and evaluate it. One of the new models that are used to measure the service quality of e-libraries is eQual model.

With this explanation, the present research is trying to use this model to assess the effectiveness of e-services quality of Ferdowsi University of Mashhad central library from the viewpoint of users (students). In the present study, the evolved version of Web Qual, known as eQual model, that is based on the users' view of the e-services quality, is used (Torigan, 2008). eQual tool has been improving since 1998, and previously, versions 1, 2, 3, and 4 of Web Qual have been presented. In this study, the evolved version 4 of WebQual , known as eQual model, is used.

This model, with multiple dimensions and based on 22 components, evaluates users' view of electronic services using a questionnaire. The model includes five general factors of 1-usability, 2- design, 3- information, -4 trusts and 5-empathy, and these five general factors are merged into three factors: usability, quality of information, and service interaction. (Barnes et al., 2005), so that usability includes the ability to use and design, quality of information includes information and services interaction includes trust and empathy.

eQual method has been offered by Barnes & Vidgen (Barnes & Vidgen, 2002) to assess the quality of the websites E-services. Dimensions and indicators of this model are shown in Table 3. Therefore, the present research can provide suitable information necessary to understand the weaknesses and strengths of the central library services from the users' point of view as a scientific basis for strategic planning in order to improve the library e-services.

The Necessity of Conducting Research

Considering the expansion of using website as a new information resource in academic libraries and the need to organize information content in order to improve the quality of service has become more evident than before and the Internet as a

global communication network and information system has offered a wide range of facilities for libraries so that they can perform their various functions in a better, faster and more efficient manner in responding to information needs of users (Fatahi and Hasanzadeh, 2006).

With this great change in the way services are provided, the way they are measured has changed too, and new indicators and models are needed to measure and evaluate these types of services. In this regard, one of the new models used to measure the quality of e-services is eQual Model. Considering the necessity of drawing the status of electronic services quality of the university central library and providing effective services to the students, the present research is trying to evaluate the effectiveness of e-services quality of the information center and central library of Ferdowsi University of Mashhad from the viewpoint of graduate students. The results of this research can be used by the experts and managers of the Central Library of Ferdowsi University and all information centers and libraries in the country to improve the website and e-services.

Literature Review

In Iran, no comprehensive research has been conducted for evaluating and measuring the quality of electronic services of libraries, and the major researches (such as Hakimi and Samadzadeh., 2005; Mirghafori and Makky, 2007) have considered the quality of traditional services of libraries. One of the few studies in Iran that have focused on organizing information on the website of libraries can be found in studies conducted by Asghari Pudeh (1380), Faroudi(2001) Farajpahloo and Saberi (2005). Reviewing the university libraries website shows that researchers have offered a model for identifying the components and key elements in designing these types of websites. Shahsavari (2001) in a study entitled "Surveying the Understanding of the Use and Satisfaction of Postgraduate Students from the Computer Services of the Central Library in Isfahan University of Technology" concluded that graduate students are aware of the computer services provided in this library and the greatest knowledge about computer services belonged to the library lending department. If the level of familiarity of users with the various library services increases, their use and satisfaction will also increase. Koch and Trevor (1997) were the first researchers who evaluated websites in terms of considering the role of classification schemes in the use of electronic resources by the libraries website (Koch and Trevor, 1997). A study that was conducted to evaluate the quality factors of the promotion of a website's e-services showed that three factors affect the quality of a website. These factors include: (a) loading time; (b) the time user searches on the website; (c) up-to-date website (Hakman, 2000). Mills (2002), quoted by Wang (2003), examined satisfaction with electronic services among 174 students in University of Midwest. The identified factors that affected satisfaction with electronic services were website interaction, perceived quality of website services and perceiving value of the website for customers. Lee and Turban (2001) believe that supportive factors to receive and send orders, customer service, speed, quality of materials, and ease of use is effective in satisfaction with electronic services. In another study aimed at examining the dimensions of website services quality, the findings indicate that the appearance of the web, entertainment of the web, job-related information, transaction capability, response time and trust have a tremendous effect on the satisfaction of the referrals (Kim & Stoe, 2004).

Research Model

The research model is shown in figure 1.

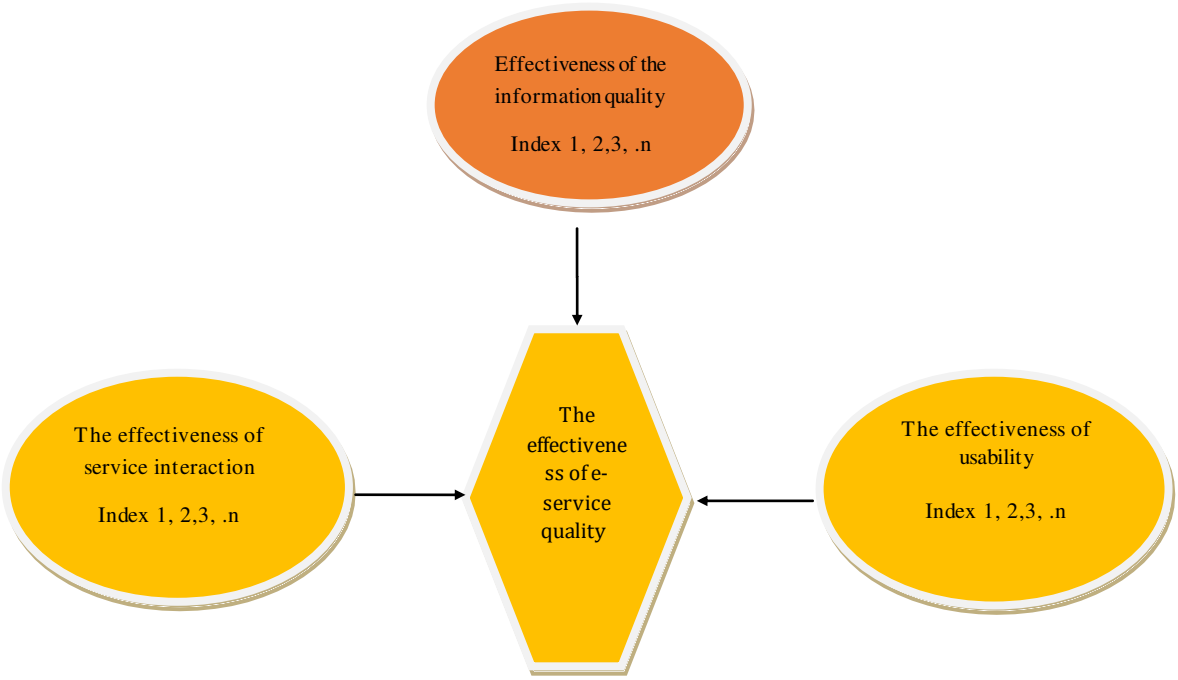

Figure 1-Conceptual model of research

Purpose of the Research:

1- Determining the effectiveness of the e-services quality provided in the central library from the viewpoints of graduate students based on eQual scale

2. Determining the relationship between the dimensions of the quality of electronic services

Research Hypotheses:

This research consists of one main hypothesis and three sub-hypotheses (Table 1).

Table 1 - Research Hypotheses

Main Hypotheses	**Sub-Hypotheses**
1- The services offered to graduate students at Central Library have been effective.	1. The quality of the services provided has been effective in terms of its usefulness. 2. The quality of services provided has been effective in terms of services interaction. 3. The quality of the services provided has been effective in terms of the quality of the information.
2. There is a significant relationship	1. There is a significant relationship between the usability

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between dimensions of e-services quality in the central library from the viewpoint of education students.	dimension and e-services quality 2. There is a significant relationship between the dimension of the service interaction and e-services quality. 3. There is a significant relationship between the quality of information and e-services quality.

Dimensions of e-service quality	Questions

Statistical Population and Statistical Sample Size

The statistical population of this research consists of all postgraduate students at Ferdowsi University of Mashhad. In 2019, their number was 8500. Since the number of this group was among limited members of the statistical community, the sample size was determined using the following formula:

$$\text{Sampling method: } n = \frac{N.z^2_{\frac{\alpha}{2}}.p.q}{e^2(N-1)+z^2_{\frac{\alpha}{2}}.p.q} \approx 372$$

In this formula: N is the volume of society, which is 8500 in this research (total graduate students at Ferdowsi University of Mashhad).

α is the error level which is 5% in this research.

P is the probability of the cases that answer the questions about the desired variable.

Z is the standard normal distribution probability, which is taken according to the error level (5%) of the table, and is 1.96 in this study.

e is the amount of error allowed in the parameter estimation which is 0.07 in this study (Khaki, 2000)

According to the calculations, the sample size is 372 people. In this research, stratified random sampling method was used. At first, the society was divided into classes according to the types of colleges and then, the questionnaires were distributed randomly among graduate students in 10 colleges. To distribute questionnaires using simple random sampling method, we need to get the samples related to every class (college) by using allocation appropriate to the size of different classes. Therefore, the following formula is used:

$$n_i = \frac{N_i}{N}.n$$

in which N_i is the volume of the population of each class, i.e. its number and n_i is the volume of the sample of the i-th class.

Variables

In this research, the factors of usability, service interaction and information quality are independent variables and effectiveness factor is the dependent variable.

ISSN- 2394-5125 VOL 8, ISSUE 01, 2021

Usability	1	Ease of use (navigation, search, find, download, speed)
	2	Quick access and easy connection to the site
	3	Easy search on the website
	4	Easy access to required information
	5	Website attractiveness and coloring
	6	Legitimate design and value of the web
	7	Observing values and considerations in website design
	8	User satisfaction after using the website
Service Interaction	9	Academic credibility of the website among users and referees
	10	Trusting website
	11	Security of confidential information and user profiles on the website
	12	Ability to quickly register on the site and create personal profiles
	13	Timely communication of website manager with users as required
	14	Ease of interaction between the user and the librarians (library authorities)
	15	Accountability and honest engagement between librarians and users (library authorities)
Information Quality	16	Up to date information and news on the website
	17	Matching the terms and information of the website with specialized tasks of library and librarians
	18	Ease in understanding the concepts and information of the website
	19	Offering clear explanation and specification of website information
	20	Trusting website
	21	Security of confidential information and user profiles on the website
	22	Web site aesthetics (colors, graphics, size, etc.)

Validity and Reliability of the Questionnaire:

The meaning of the validity is that the content of the questionnaire with questions contained therein, precisely measure studied variables. In this research, content validity of the questionnaires was approved through assessment by the librarians and senior experts of the libraries. To test the reliability of the questionnaire, Cronbach Alpha coefficient was used. According to the calculations, to determine the reliability of the questionnaire by means of pre-test, a questionnaire was distributed among 20 random samples and then, using SPSS software, the Cronbach's alpha coefficient was calculated. The Cronbach's alpha coefficient was %89. These figures indicate that the questionnaire has a high reliability.

How To Determine The Criteria For Evaluating Effectiveness

To determine the criteria for evaluating the effectiveness of this study, the mean scores in the 5 level Likert questionnaire, which is equivalent to 3, has been used as an effective criterion.

The Operational Definition Of the Questionnaire Options

For ease of questionnaires results expression, as noted, the rating of questions was conducted based on 5-point Likert scale. The very high option means that the effectiveness of the library e-services quality in related activity field is at a very good level (above the effective level). The high option means that the effectiveness of the library e-services quality in related activity field is at a good (effective) level. The moderate option (which is the Likert scale average) means that the effectiveness of the library e-services quality in related activity field is moderate. A low option means that the effectiveness of the electronic library services quality in related activity field is unacceptable and should be addressed immediately. Very low option means that the effectiveness of the library e-services quality in related activity field is so unproductive (ineffective) and serious and fundamental steps have to be taken to improve it.

Categorization of questions and dimensions of the questionnaire

Questionnaire for eQual model dimensions and indicators in assessing the quality of e-services in the central library is classified in table 2.

Table 2: Classification of questions and dimensions of the questionnaire

Research Method

The purpose of this study is applied and its method is descriptive-survey. Descriptive research can be effective in understanding the status quo and helping the decision process. Survey method can provide appropriate solutions and the questionnaire is the easiest way to prepare these data. In this research, secondary data was collected from the library and internet and for collecting primary data, a questionnaire was used (based on the eQual scale).

Model of Research Hypotheses Test

In this research, t-student test was used in order to test the hypotheses. To analyze the collected data, SPSS software was used.

Questionnaire Data Results

The questionnaire of the present study, with 22 questions, evaluated the three dimensions of library service quality from the viewpoint of 372 subjects. According to the researcher's calculations and the data obtained from the questionnaire, 78% of

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the subjects used central library e-services for more than 2 years and 22% have used these services less than 2 years. These figures indicate the satisfaction of the subjects in responding to the questionnaire.

Statistical Analysis and Results of Hypotheses Test

Considering the fact that in this research, sampling method is used to examine the effectiveness of electronic services quality of central library, it is necessary to use inferential statistics to analyze the results. Therefore, to test the hypotheses, t-student test is used (Table 3 and Table4).

Table 3(T-student Test)

Variable	Mean	T-statistic	Degrees of freedom	The significance level	Average difference	95% confidence level	
						Lower bound	upper bound
Quality of electronic services	818/2	-4/435	185	000/0	-181/001	-0/2391	-0/1120
Usability	2/949	-2/508	188	0/016	-0/07902	-0/1900	-0/0062
Service interaction	2/919	-2/503	186	0/015	-0/1220	-0/2190	-0/0235
Information quality	643/2	-6/386	180	000/0	-0/3229	-0/4220	-0/2610

Table 4. Results summary of first hypothesis test based on t-test

Hypotheses	**P -Value**	Test result with 95% confidence
1. The e-services quality offered to postgraduate students at the Central Library has been effective	000/0	Rejected
1-1. The e-services quality has been effective in terms of usability	0/0016	Rejected
2.1. The e-services quality has been effective in terms of service interaction	01/05	Rejected
3.1. The e-services quality has been effective in terms of information quality	000/0	Rejected

The results of one-sample t-test indicates that the quality of electronic services was modest in relation to the dimensions of usability and service interaction, and it was less than the average in relation to the quality of information.

As shown in Table 4, the results of one-sample t-test in relation to hypothesis 1 (effectiveness of e-service quality) indicate that the p-value or observed significant figure is smaller than 0.05 and the average quality of the provided electronic services is also lower than 3 (that is moderate point of Likert scale). Consequently, null hypothesis is confirmed and alternative hypothesis is rejected. it means that the quality of the provided electronic services is not effective in respondents' point of view.

The test results of the hypothesis 1-1 in Table 5 show that the p value or the observed significant figure is 0.016, and as this number is smaller than 0.05 and the usability average is below 3, so it can be concluded that null hypothesis is confirmed and alternative hypothesis is rejected. It means that the usability is not effective in respondents' point of view.

Test results of the hypothesis 2.1 also show that the p value or the observed significant figure is smaller than 0.05, and the average of service interaction dimension is lower than 3, therefore, we can conclude that the null hypothesis is confirmed and alternative hypothesis is rejected.

Test results of the hypothesis 3-1 indicate that the p value or the observed significant figure is 0/000 and is smaller than 0.05 and the average of information quality dimension is lower than 3. Therefore, we can conclude that null hypothesis is confirmed and alternative hypothesis is rejected. It means that the quality of information dimension is not effective in respondents' point of view.

Conclusion

In this research, we have tried to answer below question through according to student's point of view.

1. Is the quality of electronic services offered in the central library effective from the viewpoint of postgraduate students based on the eQual scale?

By analyzing the research data through inferential statistics, it was concluded that the quality of the e-services provided in the central library was not effective in any of its dimensions. Also, the effectiveness test for each dimension of e-services quality in table 4 showed that, from users' point of view and according to the results of one-sample t-test, the effectiveness of electronic services quality in relation to the dimensions of usability and services interaction is moderate and in relation to the information quality dimension is less than moderate. Among the three dimensions of e-services quality, the quality of information is the weakest dimension, while the dimension of usability is at its best.

Based on these results, it can be argued that the reason for this may be the idealistic and not real expectations of users from library electronic services, which has made them underestimate the quality of library electronic services by matching the existing situation with the mental standards that stem from their ideal expectations. At the same time, in order to meet the users' information needs and improve the library's electronic services, it is suggested that library management should consider the components and indicators of each dimension, especially the quality of information, through the following strategies:

1. Making librarians and library designers aware of current and professional advances and new achievements in library e-services and providing the necessary training in this field.

2. Recruiting specialized staff in e-commerce based on scientific methods

3. Organizing information content of the website to improve the quality of electronic services

4. Organizing short-term specialized training courses for librarians and assistant librarians to make them familiar with their duties and the type of electronic service they should offer to users.

5. Periodically evaluating the quality of the electronic library services of the central library according to users' views, and conducting corrective actions based on the results.

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