

Research Papers/Extended Abstracts

Assessing Library Website Quality on User Satisfaction: A Case Study at the University of Ruhuna

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Abstract

Library websites have become crucial for accessing resources and services in the modern world. Therefore, the quality of these digital platforms has become increasingly significant in shaping users' experiences according to existing literature. This study aimed to propose a model to explore the factors which are affecting the library website quality (QoW) and user satisfaction at the University of Ruhuna. For this purpose, a survey was carried out among 591 undergraduates in the University of Ruhuna through a structured questionnaire with a five-point Likert scale. The data were collected through the survey which was analyzed using statistical tests, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modeling (SEM). Factor analysis revealed three main factors influencing the website quality: information quality (QoI), usability quality (QoU), and service interaction quality (QoSI). A structural equation model was employed to investigate the model fit with the three hypotheses to clarify the relationships among these constructs. The findings of the study reveal that QoSI, QoU, and QoI exert a positive and significant influence on library user satisfaction. Additionally, the structural equation model of QoW was significant, accounting for 79.9% of the total variation in user satisfaction. Notably, users ranked QoI as the most critical factor, though it exhibited the lowest satisfaction level among the three dimensions. These results provide valuable insights for university library administrators, highlighting the need to prioritize improving information quality by aligning resources and services more closely with user expectations, and by enhancing and diversifying information access services.

Keywords: *Information Quality, Library Website Quality, Service Interaction Quality, Usability Quality, User Satisfaction*

Introduction

In view of the rapidly changing online perspective, website quality analysis has become more essential to businesses, educational organizations, and researchers equally. Various researchers, such as Barnes and Vidgen (2000), Loiacono et al. (2002), and Napitupulu (2017), have developed frameworks for measuring the website quality, emphasizing dimensions such as usability, information quality, and service interaction quality, with user-centered evaluations playing a pivotal role in these assessments. A comprehensive approach to analyzing complex relationships among variables is provided by Structural Equation Modeling (SEM), recommended by Anderson and Gerbing (1988). In the last few decades, several studies highlighted the importance of SEM in examining determinants of user satisfaction by Alam and Mezbah-ul-Islam (2023), and Koo et al. (2011).

In Sri Lanka, many studies have been done on evaluating the effects of quality of library website on user satisfaction. Ramanayaka et al. (2018) have studied in the context of library websites in Sri Lanka with the main purpose of exploring the relations between different dimensions of website usability and their impact. Illangarathne (2018) has identified determinants of users' satisfaction with e-library services in academic libraries in Sri Lanka.

Even though the University of Ruhuna library website offers vital information to facilitate research, education, and academic achievement, a survey of the literature indicates that no previous study has explicitly investigated the effect of the website's quality on user satisfaction. The objective of this study was to identify the factors associated with library website quality and to develop a model that assesses the impact of website quality on user satisfaction at the University of Ruhuna, utilizing Structural Equation Modeling (SEM). This study is important as it provides actionable recommendations for optimizing the library website to improve user satisfaction by creating a more supportive and effective learning environment for undergraduates at University of Ruhuna.

Methodology

Research Approach and Design

Research Hypothesis

The following hypotheses were formulated based on the research gap and objective.

H1 : Service interaction quality (QoSI) of library website positively influences user satisfaction

H2 : Information quality (QoI) of library website positively influences user satisfaction

H3 : Usability quality (QoU) of library website positively influences user satisfaction

Data Collection

A structured questionnaire using a five-point Likert scale was employed to collect primary data. The population of this study comprised the users of the library website at University of Ruhuna, Sri Lanka, and the sample was determined by using the stratified sampling technique to ensure proportional representation of the population. It was found that the "rules of thumb" in sample size specification in SEM models include, the minimum sample size rule, and the minimum number of cases per parameter (10:1 rule) (Bentler, Chou 1987).

Factor Analysis

Factor Analysis is a variable reduction method that reduces the set of observed variables in terms of fewer latent factors.

The main objective of factor analysis's EFA technique is to determine the underlying correlations between the variables under evaluation. Researchers frequently use it to find a set of latent constructs underlying a battery of measured variables while developing a scale, a collection of questions intended to measure a certain study topic. The EFA is necessary to identify underlying factors for a set of measured variables.

Choosing the Number of Factors

Several criteria have been proposed for choosing the number of factors (m). There are four criteria will be taken into consideration,

1. Choose m equal to the number of factors necessary for the variance accounted for to achieve a predetermined percentage, 80%.
2. Choose m equal to the number of eigenvalues greater than the average eigenvalue.
3. Use the screen test based on a plot of the eigenvalues of the sample covariance matrix or correlation matrix. If the graph drops sharply, followed by a straight line with a much smaller slope, choose m equal to the number of eigenvalues before the straight line begins.
4. Test the hypothesis that m is the correct number of factors, $H_0: \Sigma = LL' + \varphi$, where L is $p \times m$.

Confirmatory factor analysis (CFA) was performed to predetermine the factor structure and verify the reliability and validity of the constructs.

Structural Equation Modeling

A comprehensive statistical method called Structural Equation Modeling (SEM) implies researchers investigate and examine the relationships between observable variables and underlying latent constructs. A confirmatory method is commonly employed by researchers when using Structural Equation Modeling (SEM). This approach begins with hypothesizing relationships between key study constructs and creating a 'model' of interactions between variables. In contrast to standard regression, SEM can incorporate latent variables concepts that are not directly measured but inferred from observed indicators using measurement models. Researchers then examine the observed data to confirm the directionality and significance of these interactions, providing a deeper understanding of the relationships among the constructs.

Results and Discussion

Descriptive Statistical Perspective

The questionnaire with a five-point Likert scale was distributed among the 591 library end users to capture demographic information, including faculty, gender, and level of study. According to this analysis, 55.7% of the respondents were female and 44.3% were male. The highest number of respondents came from the Faculty of Humanities and Social Sciences, accounting for 17.6%, while the Faculty of Fisheries and Marine Sciences & Technology had the lowest representation at 5.9%.

Exploratory Factor Analysis

Exploratory factor analysis (EFA) is a technique for determining the statistical characteristics of an unknown scale (Tabachnick et al., 2013). In this study, the factors in a principal component analysis with VARIMAX rotation were identified using the Kaiser criterion. Eigenvalues were used in the EFA for determining influencing factors. As a result, three factors affecting the library website quality which are usability quality, service interaction quality, and information quality were appropriate.

Reliability Verification

Cronbach's alpha is a measure of internal consistency reliability commonly used to assess the reliability of scales or measures within a research study. The resulted Cronbach's Alpha values of the constructs (QoSI=0.796, QoI=0.910, QoU=0.909, and QoW=0.839) were higher than the suggested threshold of 0.70, indicating a model with good internal consistency and dependability when it comes to relationship measurement.

Validity Test

Bartlett's test of sphericity is used to ensure the data has adequate correlations among the variables. All of the KMO values (QoSI=0.748, QoI=0.936, QoU=0.932, and QoW=0.722) for data validity are near to 1, and it has been found that all Bartlett's tests were significant at 5% level of significance.

The values of composite reliability (CR) (QoSI=0.801, QoI=0.910, QoU=0.911) higher than the threshold level of 0.60 and the values of Average Variance Extracted (AVE) (QoSI=0.504, QoI=0.501, QoU=0.533) higher than the threshold level of 0.50. Additionally, each indicator shows loading greater than 0.50 ($p < 0.001$) on the corresponding components. They remained in the measurement model since their factor loadings were significant. Factor analysis showed that all the items were loaded on the factors from 11.438 to 0.257 where the eigenvalue of the Rotation sums of Squared Loadings was from 5.405 to 3.955 for three factors which were higher than the threshold of one (Andaleeb and Simmonds, 1998), indicating three variables were significant for conducting factor analysis.

Confirmatory Factor Analysis

Confirmatory Factor Analysis (CFA) is a statistical technique commonly used to test the measurement model by assessing the relationship between observed variables and latent variables. Every item in each construct of the initial measurement model for Library Website Quality (QoW) is greater than 0.6 and hence, the item reduction process was not carried out. As a result, the SEM-produced Modification Indices (MI) table was used to analyze the redundant elements in the initial measurement model. Finally, the re-specified measurement model for Library Website Quality (QoW) was obtained by deleting items which had a correlation coefficient greater than 0.15 as considered highly connected.

Structural Equation Model

A structural equation model generated through AMOS was used to test the relationships. The fit indices for the model were within the acceptable range (Hair et al., 2010): CMIN/df =2.512, the goodness-of-fit (GFI) =0.939, TLI =0.959, CFI =0.966, SRMR =0.0346, and RMSEA =0.051.

The squared multiple correlation was 0.799 for library website quality, this shows that 79.9% variance in library website quality is accounted for by service interaction quality, information quality, and usability quality.

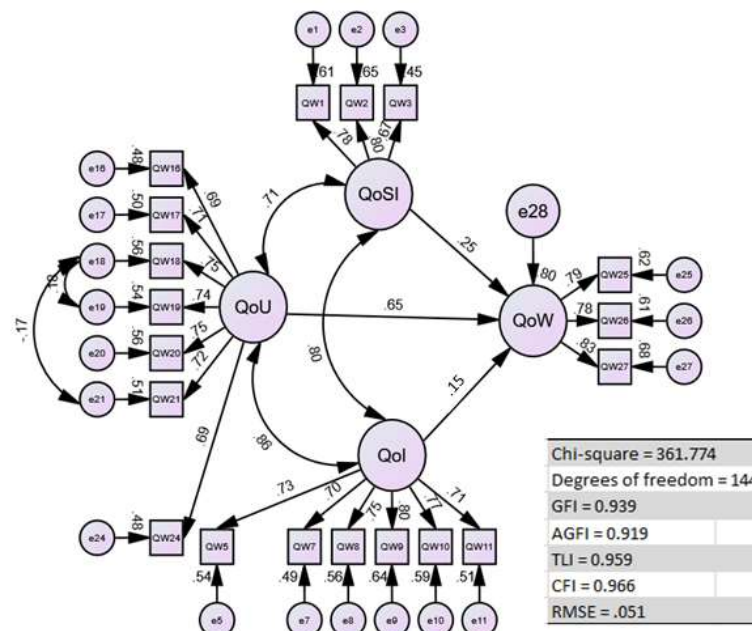


Figure 1: Structural equation model for library website quality (QoW)

The measurement equation models identified are;

Service Interaction Quality(exogenous)

$$QW1 = 0.78*QoSI + 0.61$$

$$QW2 = 0.80*QoSI + 0.65$$

$$QW3 = 0.67*QoSI + 0.45$$

Information Quality(exogenous)

$$QW5 = 0.73*QoI + 0.54$$

$$QW7 = 0.70*QoI + 0.49$$

$$QW8 = 0.75*QoI + 0.56$$

$$QW9 = 0.80*QoI + 0.64$$

$$QW10 = 0.77*QoI + 0.59$$

$$QW11 = 0.71*QoI + 0.51$$

Usability Quality(exogenous)

$$QW16 = 0.69*QoU + 0.48$$

$$QW17 = 0.71*QoU + 0.50$$

$$QW18 = 0.75*QoU + 0.56$$

$$QW19 = 0.74*QoU + 0.54$$

$$QW20 = 0.75*QoU + 0.56$$

$$QW21 = 0.72*QoU + 0.51$$

$$QW24 = 0.69*QoU + 0.48$$

Quality of library website (endogenous)

$$QW25 = 0.79*QoW + 0.62$$

$$QW26 = 0.78*QoW + 0.61$$

$$QW27 = 0.83*QoW + 0.68$$

The structural equation for the quality of the library can be written as;

$$QoW = 0.15*QoI + 0.25*QoSI + 0.65*QoU$$

Hypothesis Testing

Finding the independent variables that have a significant relationship with the dependent variables is the objective of hypothesis testing. SEM was used for this study to examine the hypotheses. Through other factors declared in between the other two variables and direct influence from one variable to another, SEM reveals information about the predicted impact. AMOS 26.0 was used to conduct this investigation.

Table 1: Hypothesis testing results for library website quality (QoW)

Hypothesis	Path Coefficient	S.E	C.R	p-value	Decision
H1: QoSI → Satisfaction	0.259	0.060	3.789	0.000	Highly Significant
H2: QoI → Satisfaction	0.157	0.017	9.235	0.000	Highly Significant
H3: QoU → Satisfaction	0.652	0.093	7.752	0.000	Highly Significant

The findings of testing the current study hypotheses are shown in Table 3.7. The 'Decision' column presents the outcome of the p-value, which indicates if the hypothesis was supported or not. According to the standardized coefficient beta values, user satisfaction was significantly impacted by the service interaction quality, information quality, and usability quality of the library website. The coefficient

beta values mean that a 1% increase in the service interaction quality, information quality, and usability quality of the library website is predicted to result in a 2.19% increase in user satisfaction respectively.

Conclusion

This study aimed to investigate the factors of the University of Ruhuna library's website quality that influence user satisfaction, addressing a notable gap in the literature, as previous research has not specifically explored the impact of these factors on user satisfaction within the context of the University of Ruhuna, particularly using advanced techniques involving SEM. The primary analysis was conducted through a descriptive perception. This study found strong internal consistency in each construct, as indicated by Cronbach's alpha, and adequate correlations among variables, confirmed by Bartlett's test of sphericity. Moreover, this study revealed that information quality (QoI), usability quality (QoU), and service interaction quality (QoSI) are the three main factors influencing library website quality throughout factor analysis. According to hypothesis testing using SEM, the University of Ruhuna Library's user satisfaction was significantly and positively influenced by the quality of information, service interactions, and usability as demonstrated by the significant results of the SEM approach.

As a recommendation, library authorities should prioritize improving information quality and expanding access facilities in line with user expectations to address the lowest satisfaction level among the three factors to enhance the necessary skills to succeed in the academic achievements of university students. Future studies can expand the scope of this study by comparing its results with those of other universities' libraries to pinpoint best practices and potential areas for development. Moreover, the comprehensive impact assessment can be conducted to measure the direct influence of academic achievement on broader educational outcomes such as student retention, graduation rates, and career success.

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