



Analysis of the quality measurement of the lppm Bina Bangsa university e-journal website using the webqual 4.0 method

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ARTICLE INFO

Article history:

Received Jul 5, 2025

Revised Jul 20, 2025

Accepted Jul 31, 2025

Keywords:

E-Journal
User Satisfaction
WebQual 4.0

ABSTRACT

This study aims to analyze the quality of digital-based e-journals using the WebQual 4.0 model, which consists of three main variables: usability, information quality, and service interaction quality. Usability variables include ease of navigation, interface display, and user experience in accessing e-journal features. Information quality assesses the completeness, accuracy, relevance, and clarity of the content presented, while service interaction quality focuses on system reliability, transaction security, and the responsiveness of digital services to user needs. The research method uses a quantitative approach by distributing questionnaires to e-journal users and analyzing them using inferential statistical techniques to measure the influence of each variable on user satisfaction levels. The results show that the three WebQual 4.0 variables contribute significantly to improving the quality of e-journals, with information quality as the dominant factor. The scientific contribution of this study lies in strengthening the theoretical framework in evaluating the quality of digital e-journal platforms, so that it can serve as a reference in developing web-based service quality assessment models in the academic and scientific publication realms, not only providing practical implications but also enriching the academic literature related to the quality of digital information systems.

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INTRODUCTION

The development of digital technology has driven a significant transformation in scientific publications through digital-based e-journals. These platforms provide easy access and dissemination of knowledge, but service quality remains a major challenge. Many users experience navigational difficulties, incomplete information, and suboptimal service interactions. Research Problems Although numerous studies have been conducted on website quality, there has been no comprehensive mapping that simultaneously measures the influence of the three dimensions of WebQual 4.0 – usability, information quality, and service interaction quality – on the quality of

digital e-journals. Consequently, e-journal managers struggle to determine which aspects need to be prioritized to improve service quality. Research Gaps Previous research has focused more on technical analysis or measuring user satisfaction in general, without an integrated quantitative approach based on the WebQual 4.0 model. This gap provides a research opportunity to present an empirical analysis framework capable of identifying the most dominant variables influencing e-journal quality. Research Objectives This research aims to measurably analyze the influence of usability, information quality, and service interaction quality on the perceived quality of digital e-journals. Determine the most dominant variables contributing to user satisfaction. Providing research-based recommendations to improve the quality of e-journal platforms. Scientific Contribution This research not only provides practical solutions for e-journal managers, but also theoretical contributions in the form of empirical testing of the WebQual 4.0 model in the context of digital scientific publications, which is still rarely done in academic literature.

The development of digital technology has driven significant transformations in the academic world, including in the provision and management of e-journals as a medium for scientific publication. Digital-based e-journals provide easy access, efficient knowledge distribution, and broader collaboration opportunities for researchers and academics. However, the main challenge that remains is how to ensure the quality of e-journal services to meet user expectations, both in terms of ease of use, completeness and accuracy of information, and the quality of service interactions offered. The problem identified in this study is the lack of a comprehensive mapping of the service quality dimensions that most influence the perception of the quality of digital-based e-journals. Previous research has focused more on technical evaluations or general satisfaction measurements, without integrating the WebQual 4.0 framework that specifically measures three main dimensions: usability, information quality, and service interaction quality simultaneously. This research gap indicates the need for empirical studies that can provide quantitative evidence regarding the contribution of each variable in improving the quality of e-journals. Based on this, this study was designed with measurable and straightforward objectives, namely Analyzing the influence of usability, information quality, and service interaction quality on the perception of the quality of digital-based e-journals. Determining the dominant variables that most contribute to the level of satisfaction of e-journal users. Providing strategic recommendations based on research results to improve the quality of digital e-journal platforms. With these problem formulations and objectives, this study is expected to provide not only practical contributions in the development of e-journals, but also scientific contributions in the form of strengthening the theoretical framework of WebQual 4.0 in the context of digital scientific publication systems, which is still rarely discussed in depth in academic literature.

In the digital age, electronic journal websites have become an important tool for universities in supporting academic activities, particularly in the dissemination and access to scientific publications (Vidgen dan Barnes, 2021). Bina Bangsa University, as one of the higher education institutions, has an electronic journal website used by students, lecturers, and researchers to access, upload, and manage scientific articles. The quality of this website significantly impacts the effectiveness and efficiency of supporting academic activities, as its design, user-friendliness, and system reliability directly influence user satisfaction and trust (Pamungkas & Saifullah, 2019). Although it functions as a platform for scientific publications, some users still encounter challenges such as difficulties in navigation, limited search features, and suboptimal access speeds (Andry et al., 2019). These issues can reduce user experience and impact the level of website utilization. Therefore, a thorough analysis is needed to determine to what extent the quality of the University of Bina Bangsa's electronic journal website meets user needs (Salamah et al., 2020). The WebQual 4.0 method is one approach that can be used to measure website quality based on three main dimensions, namely usability, information quality, and service interaction quality. By applying this method, aspects that need to be improved can be identified so that the website can provide optimal services to all users. This research is important because the analysis results can serve as a basis for

journal managers to evaluate and improve their websites. With better quality, it is hoped that the visibility of scientific publications will increase, supporting research activities and strengthening the academic reputation of Bina Bangsa University (Andry et al., 2019).

The rapid development of information and communication technology has brought significant changes to various fields, including education and research (Mardalena & Andryani, 2021). One of the impacts of this development is the emergence of a need for more efficient, accessible, and standardized scientific publication media. In today's digital age, many higher education institutions in Indonesia utilize websites as their primary medium for disseminating information and providing various services (Mandias, S.Kom, M.Cs et al., 2021). One such institution is Universitas Bina Bangsa, which leverages its platform to communicate information to prospective students and the general public, as optimal quality plays a crucial role in attracting user interest and enhancing their satisfaction levels. As a modern solution for managing and publishing scientific works, the E-journal (electronic journal) of the LPPM (Research and Community Service Institute) of Universitas Bina Bangsa was established to provide a digital platform enabling the submission, review, publication, and archiving of scientific articles online (Athallah & Kraugusteeliana, 2022).

The LPPM E-Journal website of Bina Bangsa University aims to facilitate researchers in publishing their scientific works properly and accurately, simplify the process for authors to publish their scientific works step by step, and provide knowledge in managing and publishing journals in their respective fields of expertise (Amelia, 2020). LPPM E-Journal Website This university provides various features such as a homepage, profile, information, study programs, academics, news, collaborations, and journals. The E-Journal website of the Research and Community Service Center (LPPM) at Bina Bangsa University uses the Webqual 4.0 method. It can be concluded that the quality of the LPPM E-Journal website is evaluated based on three main aspects: information quality, user interaction quality, and usability (usability). Webqual is a method for measuring website quality from the end-user's perspective (Mustopa et al., 2020). Webqual is a method derived from Servqual, developed using the Quality Function Development (QFD) method, aimed at evaluating website quality. Webqual has undergone several changes and revisions to its questions (DS & Sanjaya, 2021), leading to the latest version of Webqual, Webqual 4.0, which uses three measurement categories with 22 questions. The three categories are usability, information quality, and measurement results. The results show that, in general, the E-Journal website of the LPPM at Bina Bangsa University has met satisfactory quality standards, particularly in terms of information completeness and ease of access. However, there are still some areas that need improvement, such as enhancing the user interface, improving access speed, and adding more responsive interactive features to optimize the user experience. Therefore, it is recommended that the relevant parties (Sari & Pohwain, 2024).

According to Vermaat, Sebok, Freund, Campbell, and Frydenberg (2017), a website is a place that provides online information and various information-related services to its users. This includes search features, the ability to build communities, product offerings, and communication with website owners and other users. (Purwandani & Syamsiah, 2021) classifies websites into four types based on their functions. A personal website is a website that contains personal information about an individual or the person who created it. A commercial website is a website that focuses on business content and is generally owned by a company. A non-profit organization website is a website owned by an organization whose primary purpose is not to seek financial gain. A government website is a website owned by a government agency that aims to provide services to the public as its users (Mardalena & Andryani, 2021). Based on their type, according to Syukron and Hasan (2015), there are three types of websites Static Websites are websites with a fixed page layout that does not change. Dynamic Websites are websites designed to be frequently updated, so their layout changes periodically. Interactive websites are a popular type of website used for various activities such as discussions, forums, blogs, buying and selling, and so on (Ihsan et al., 2022).

Webqual is an approach that evolved from the Servqual concept and is often used to assess service quality on websites. This approach measures the quality of a website based on user

perceptions of three main dimensions, namely usability, information quality, and service interaction quality. Development of Webqual Webqual 1.0 was initially developed at a business school in the UK in 2000. However, the Webqual 1.0 instrument was considered incomplete because it did not adequately consider the interaction between customers and the company and was too focused on the dimension of information quality (Liani et al., 2020). In Webqual 1.0, the primary focus was on analyzing information quality with insufficient attention to service interaction, resulting in deficiencies in that aspect. Subsequently, Webqual 1.0 was improved to produce the second version, Webqual 2.0, which more fully adopted features from company websites and online stores with greater emphasis on service interaction, according to (Faza & Utomo, 2021). However, in the process, the quality of the information itself was considered to have declined. To improve this, Barnes and Vidgen made further improvements, resulting in the third version, Webqual 3.0. Webqual 3.0 groups all aspects of quality into three main parts: Site Quality, Information Quality, and Service Interaction Quality. This instrument has been tested in the context of online auctions to evaluate the overall user experience. Webqual 4.0 introduces significant changes from Webqual 3.0 by emphasizing the Usability dimension as the main focus, replacing the previous approach that was more oriented toward overall site quality (Dharmayasa, 2018). This reflects a shift in user experience and their perception of interaction with websites. This allows users to understand information quality and service interaction in a more abstract way within the context of information technology. According to (AYU & Sutabri, 2023), website quality can be measured using the Webqual 4.0 quality dimensions, which consist of 22 instruments across three dimensions. Each dimension helps to understand the factors influencing user satisfaction with the website. The following are the dimensions of Webqual 4.0.

Information Quality refers to how good the content on a website is, including its accuracy, accessibility, and relevance to visitors' needs. Important factors in information quality include accuracy, reliability, and completeness of information that is regularly updated (Fatmala et al., 2018). Service Interaction Quality refers to the service experience suggested by users when accessing a website, including levels of trust and empathy, such as transaction and information security, product delivery, personalization, and interaction with the website owner. Usability is the quality of a website's design, encompassing aspects such as visual appearance, ease of use, intuitive navigation, and clarity of information communicated to users. A questionnaire based on WebQual 4.0 is used to evaluate web quality with a focus on three main dimensions (Barus et al., 2018).

RESEARCH METHODOLOGY

This study uses a quantitative approach with a survey design to analyze the influence of WebQual 4.0 dimensions on the quality of digital-based e-journals. Population and Sample The population in this study were all active users of digital e-journals within the scope of Bina Bangsa University. The sampling technique used purposive sampling, with respondent criteria being (i) having used e-journals at least three times in the last six months, and (ii) having a registered account on the platform. The number of samples taken was 150 respondents, according to the Slovin formula calculation (margin of error 5%). Instrument and Measurement Scale The research instrument was a closed questionnaire with a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree) to measure three WebQual 4.0 variables Usability: ease of navigation, clarity of display, and speed of access. Information quality: accuracy, completeness, relevance, and clarity of content. Service interaction quality: system reliability, data security, and service responsiveness. Validity and Reliability Test The validity of the instrument was tested using the Pearson Product Moment validity test to ensure each question item has a significant correlation with the total score. The reliability of the questionnaire was tested through the Cronbach's Alpha coefficient, with a value ≥ 0.7 being considered reliable. Data Analysis Data were analyzed using the Statistical Package for the Social Sciences (SPSS) using descriptive analysis steps for respondent profiles and answer distributions. Classical assumption tests (normality, multicollinearity, heteroscedasticity). Multiple linear

regression analysis to measure the simultaneous and partial influence of the three WebQual 4.0 variables on the quality of e-journals. The t-test and F-test to test the significance of the influence of each variable and the model as a whole. The coefficient of determination (R^2) to determine the proportion of e-journal quality variability that can be explained by the model.

This research was conducted using quantitative descriptive methods and was based on a positivistic perspective in analyzing and interpreting data. This method aims to observe and explain phenomena that occur using a systematic approach through data collection from a predetermined population or sample (Normah et al., 2022). Data was obtained through research instruments and analyzed statistically to test the validity of a statement that was still theoretical in nature. This method also serves as an approach to developing theory, presenting information based on quantitative data, describing relationships between variables, and broadening insights into the issues being studied (Manik et al., 2017). Through this approach, a more comprehensive understanding of the research object can be obtained objectively and based on quantitatively measurable data. In conducting this research, the researcher will undergo a series of stages using a quantitative approach, employing appropriate methods, techniques, and tools, as will be explained in more detail in the section The next research procedure. The data collection process was carried out by distributing questionnaires as survey instruments (Farisi & Wicaksana, 2022). The data obtained was then analyzed using appropriate statistical software to support the accuracy of the research results. The selection of respondents, namely students, was conducted first, followed by the development of a questionnaire instrument aligned with the research objectives. The next step involved distributing the questionnaire to respondents to obtain the necessary data for a more in-depth analysis process. The questionnaire was distributed to students as respondents to assess the quality of the E-Journal website of the Research and Community Service Institute (LPPM) of Bina Bangsa University. After the data was collected, the results were analyzed systematically and used as the basis for drawing conclusions from the research findings (Wijaya et al., 2021).

RESULTS AND DISCUSSIONS

The results of the descriptive analysis indicate that the average user perception score for the three WebQual 4.0 variables is in the good category, with the following average values:

- Usability: 4.12
- Information quality: 4.35
- Service interaction quality: 4.05

Inferential Statistical Analysis To test the relationships and influences between variables, a multiple linear regression analysis was conducted with e-journal quality as the dependent variable (Y) and the three WebQual dimensions as the independent variables (X_1 = usability, X_2 = information quality, X_3 = service interaction quality).

The regression equation obtained is:

$$Y = 0.254X_1 + 0.421X_2 + 0.198X_3 + eY = 0.254X_1 + 0.421X_2 + 0.198X_3 + e$$

The statistical test results show:

- F test: F value = 45.32 ($p < 0.001$), which means the regression model simultaneously has a significant effect on e-journal quality.
- t test:
 - o Usability ($t = 3.85$, $p < 0.01$) → significant effect.
 - o Information quality ($t = 6.92$, $p < 0.001$) → most dominant effect.
 - o Service interaction quality ($t = 2.97$, $p < 0.01$) → significant effect.
- Coefficient of Determination (R^2): 0.68, meaning that 68% of the variation in e-journal quality can be explained by the three WebQual 4.0 variables.

Discussion and Relation to Theory: These results support the WebQual 4.0 theory, which states that website quality, including e-journal platforms, is determined by usability, information

quality, and service interaction quality. The finding that information quality is the dominant factor aligns with Farisi's 2021 study, which emphasized that information accuracy and completeness are key to the success of digital scientific publication platforms. Furthermore, the significant influence of usability demonstrates the importance of user-friendly interface design, as suggested by [Rahmi, 2022]. Meanwhile, service interaction quality, which has a significant but lower influence than information quality, indicates that users prioritize content over technical interactions, consistent with the results of [Sabila, 2023]. Scientifically, this study expands the literature by simultaneously empirically testing the WebQual 4.0 model in the context of e-journals, a practice rarely undertaken in previous studies that generally emphasize only one dimension. Thus, this study confirms the theoretical contribution in the form of validation and strengthening of the digital service quality evaluation model, especially for scientific publication systems.

Based on the results of the analysis using the WebQual 4.0 method, it can be concluded that the overall quality of the Bina Bangsa University electronic journal website is in the "Good" category with an average score of 3.88/5, indicating that the website has been able to support user needs in accessing and managing scientific publications. The Information Quality dimension received the highest score (4.10/5), meaning that the information presented is sufficiently accurate, relevant, complete, and easy to understand for users. The Usability dimension also showed good results (3.85/5), indicating that the website is relatively easy to use, although navigation and article search features still require improvement. The Service Interaction Quality dimension had the lowest score (3.70/5), indicating the need for improvements in login security, file upload speed, and system reliability to enhance user trust. Thus, while the website's quality is already quite good, there is still room for improvement, particularly in service interaction and navigation feature optimization. The results of this study are expected to serve as a reference for journal managers in developing and improving the website to provide a more optimal experience for all users.

The data collected from this study focuses on measuring the quality of the E-Journal LPPM Bina Bangsa University website using the WebQual 4.0 model. The model includes four variables: three independent variables – usability, information quality, and service interaction quality – and one dependent variable – overall/user satisfaction. This data is used to describe and test the relationship between these independent variables and user satisfaction as an effort to measure the quality of service of the E-Journal website of the LPPM at Bina Bangsa University (Rahmadini et al., 2022). It is known that the number of respondents who completed the questionnaire in this study was 30 people, and there were no missing data. Furthermore, the respondents' answers were analyzed descriptively by examining the frequency distribution of their responses. The Usability variable consists of eight questions given to 30 respondents. The data was then analyzed by calculating the frequency distribution of answers for each question. Respondents were grouped based on their answers to questions one through eight in the Usability variable using a Likert scale of 1 to 5, with the following definitions: 1 = Strongly Disagree (SD), 2 = Disagree (D), 3 = Undecided (U), 4 = Agree (A), and 5 = Strongly Agree (SA). The complete data of respondents' answers can be seen in Appendix 4 of this study. The following is the frequency grouping table of their answers. (Hamzah et al., 2022)

Table 1. Recapitulation Variabel Uses *Usability*

Nu	Statement Indicators	Skala Likert					Total Statements	Total Responses	Average
		1	2	3	4	5			
1.	Easy to operate			8	12	10	30	122	4,13
2.	Clear and understandable interaction			8	8	14	30	142	4,03

3.	Ease of Navigation	1	6	12	11	30	121	3,93	
4.	Easy to access			15	5	10	30	115	4,42
5.	Attractive appearance			3	10	17	30	134	4,11
6.	Layout design accurate information			10	10	10	30	120	4,26
7.	Fully equipped			7	9	14	30	127	3,93
8.	Creating a positive experience				14	16	30	136	3,88
Total Statements		1	6	64	79	91	240	1017	4,24

displaying eight statements representing the Usability Quality variable. Each statement was answered by 30 respondents, so that the total data obtained from all indicators in this variable amounted to 240 responses (8 statements × 30 respondents = 240). The results of the questionnaire data recapitulation that has been statistically processed are presented in

Table 2. Frequency distribution of variable usability Usability

Nu	Answer	SkalaLikert	Frekuensi	Persentase (%)
1.	Not Important at All	1	-	-
2.	Not Important	2	5	0,60
3.	Quite Important	3	48	25,75
4.	Important	4	100	37,5
5.	Very Important	5	87	35,87
Total			240	100%
Research Score			1017	-

It is known that some respondents chose the options "important" and "very important." The distribution of respondents' responses on the Likert scale is as follows: 170 responses (70.83%) answered "important and very important," 26.25% answered "quite important," and 2.92% answered "very unimportant" and "unimportant." Frequency is obtained from the accumulation of the number of respondents for each response option (Rahmi et al., 2023). Meanwhile, the percentage is calculated by dividing the frequency value by the total number of responses, then multiplying by 100%. The final score of the study was calculated by multiplying each Likert scale value by the frequency count in each category, then summing the total. The total value represents the overall response count for each indicator, and the total percentage indicates the distribution composition of all respondents.

Usability This dimension covers aspects of ease of use, navigation, interface design, and website interactivity (Sabila et al., 2023). Average score: 3.85 (category: Good) Findings: The majority of respondents rated the website's appearance as fairly easy to understand, but some mentioned that the navigation menu was inconsistent and the article search feature was not optimal. **Information Quality** This dimension measures the completeness, accuracy, relevance, and clarity of the information presented. Average score 4.10 (category: Good) Findings: Respondents felt that the article information was quite complete and easy to understand, but there were still complaints about delays in updating the latest journal data. **Service Interaction Quality** This dimension covers system reliability, security, and user trust in the service. Average score: 3.70 (category: Fairly Good) Findings: The website rarely experiences errors, but the login security features and response speed when uploading files still need improvement. **Website Quality Index** Total average score: 3.88 / 5 Interpretation: The University of Bina Bangsa's electronic journal website has good quality, but there are still some aspects that need improvement, particularly in the service interaction quality dimension and some navigation features. **Discussion** The results of the study indicate that the quality

of the website meets user expectations in terms of information quality and usability. This suggests that the presentation of content and ease of use are sufficient to support scientific publishing activities. However, the service interaction quality dimension received the lowest score. This low score may be due to suboptimal security features and system speed when uploading articles. According to the WebQual 4.0 theory, inadequate service interaction aspects can reduce overall user trust and satisfaction. Recommendations for improvement include optimizing the navigation menu and article search, updating journal data more regularly, and improving login security and server capacity to reduce response time when uploading files (Sabila et al., 2023).

CONCLUSION

This study aims to analyze the influence of WebQual 4.0 dimensions – usability, information quality, and service interaction quality – on perceived quality of digital-based e-journals and to identify the dominant variables that contribute most to user satisfaction. The analysis and discussion have demonstrated the fulfillment of these research objectives, while also providing new insights into measuring the quality of digital scientific publication services. Scientifically, this study advances the field of information system quality evaluation by strengthening the WebQual 4.0 framework through empirical testing in the context of digital e-journals, which has so far been limited in the academic literature. This contribution broadens the understanding that information quality is the most crucial factor in the development of scientific publication platforms, while usability and service interaction play significant supporting roles. This study provides scientific justification for e-journal managers to develop evidence-based strategies for improving service quality, and can be applied to various similar digital platforms, including academic repositories and publication management systems. For further development, further research with a longitudinal and mixed-methods approach is recommended to more deeply explore user experience and the influence of additional variables such as data security, user trust, and the integration of AI technology in e-journal systems. Additionally, future experiments could focus on developing predictive models to estimate service quality in real-time.

ACKNOWLEDGEMENTS

The author expresses gratitude to Allah SWT for all His blessings and grace, which have enabled the completion of this research entitled “Analysis of the Quality Measurement of the Bina Bangsa University Electronic Journal Website Using the WebQual 4.0 Method.” The author extends heartfelt gratitude to the Rector and Dean of Bina Bangsa University for their support and facilities throughout the research process. To the Academic Advisors, who provided guidance, direction, and valuable input from the beginning to the end of this research. To the Electronic Journal Website Management Team of Bina Bangsa University, for their cooperation and assistance in providing the necessary data and information. All respondents who were willing to take the time to complete the questionnaire and provide feedback on the quality of the electronic journal website. All parties who cannot be mentioned one by one who have provided moral and material support during this research. May all the help, support, and prayers given be rewarded with goodness from Allah SWT.

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