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Evaluating the Basa-Samawa Platform through WebQual 4.0 and Importance–Performance Analysis

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ABSTRACT

The rapid technological development in the era of Industry 4.0 has significantly influenced the education sector, including the implementation of digital learning methods such as e-learning. This research aims to develop and evaluate a responsive web-based e-learning application for learning the Samawa (Sumbawa) regional language, in response to the declining interest of younger generations in regional languages and the increasing threat of language extinction. The methodology is a quantitative descriptive approach using WebQual 4.0 and Importance-Performance Analysis (IPA) to measure user perceptions and satisfaction with the e-learning system. Data were collected through questionnaires distributed to 170 respondents, including 25 teachers and 145 students in Sumbawa Regency, using simple random sampling. The questionnaire covered three key variables: usability, information quality, and interaction quality. The results of the validity and reliability tests confirmed that the instrument was appropriate for data collection. Descriptive statistics indicated that users generally rated the e-learning application positively, although there were discrepancies between perceived performance and expectations, particularly regarding usability and interaction. IPA quadrant analysis revealed that several indicators, especially related to navigation and content accuracy, fall into the "main priority" category and require immediate improvement. Overall, the average performance score (3.76) was slightly below the expected average (3.84), indicating the need for further refinement in certain features. The integration of WebQual 4.0 and IPA effectively identified user needs and can serve as a framework for the continuous improvement of regional language e-learning systems.

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1. INTRODUCTION

Preserving regional languages is an important aspect in maintaining the cultural identity and intellectual wealth of a nation [1]. However, in recent decades, many regional languages in Indonesia have experienced a drastic decline in the number of active speakers, including Samawa (Sumbawanese). It is estimated that around 40% of the world's languages are at risk of extinction within the next century [2]. Globalization, urbanization, and the lack of interest among young people in learning regional languages have accelerated the threat of extinction. UNESCO has even classified several regional languages in Indonesia as endangered. The extinction of regional languages does not only mean the loss of a means of communication, but also the loss of local knowledge, cultural values, and community perspectives that have been passed down from generation to generation [3]. Language is a reflection of the identity and character of a community, so the extinction of a language means weakening the nation's cultural diversity [4]. In this context, efforts to revitalize regional languages are urgent, particularly through approaches that can attract the interest of the younger generation. Therefore, appropriate strategies are needed to revitalize the use of regional languages, one of which is through the development of technology-based learning media such as e-learning, which can reach the younger generation effectively and adaptively [5].

Several previous studies have examined the development and evaluation of e-learning platforms using quantitative methods, including WebQual 4.0 and Importance-Performance Analysis (IPA). Research by Yusuf found that the combination of Webqual 4.0 and IPA was able to identify priority areas for improvement in online learning systems [6]. In this research, the method is the same as in this study; however, several items and components in the science analysis were not used. Zainal researched user experience in e-learning at BDK Makassar and found that information and service aspects were the main concerns [7]. Zainal's research used only the WebQual method, without combining it with the IPA method, as was done in this research. Utami used usability testing methods, namely the Performance Measurement technique and Retrospective Think Aloud (RTA) to evaluate the e-learning of Ganesha University of Education in terms of usability [8]. Utami's method differs from this research's, namely RTA, whereas this research employs a combination of WebQual and IPA to assess the effectiveness of the Basa-samawa platform.

Another study that became a reference for this research, namely Novita Sari and Rahmi, measured the effectiveness of the National Gallery of Indonesia's website with WebQual 4.0, which stated that this website was the least chosen, but overall, the site's services met user expectations [9]. This research does not combine the WebQual and IPA methods; it tests the web using only the WebQual method. Another study conducted by Gani, which measured website quality using the webqual 4.0 4.0 and IPA methods, showed that the resulting performance was very helpful for companies that have websites in order to improve the quality of web services as a form of improving services for the company's consumers [10]. Overall, the WebQual 4.0 and IPA approaches are highly relevant for evaluating online learning systems from a user perspective and can be used to develop systems that are more effective and responsive to user needs. Through a combination of the WebQual 4.0 and IPA approaches, this study is not only able to identify the quality of websites quantitatively, but also provides strategic direction for website managers in improving the aspects that have the most influence on user satisfaction [11]. Thus, it is hoped that the research results can be the basis for improving and developing websites to make them more effective, efficient, and in accordance with user needs.

Although numerous studies have explored e-learning using the WebQual 4.0 and IPA approaches, there is still very little research specifically examining its application to regional language learning, particularly in Samawa. Most studies still focus on e-learning for general subjects or foreign languages and have not addressed local language preservation as a primary concern. Furthermore, research that integrates quality evaluation and improvement priorities from the perspective of local users within the context of regional culture remains very limited. The Basa Samawa platform is an e-learning platform that has been developed and will be used extensively in schools as the official learning medium for regional languages in Sumbawa Regency. As the first regional language e-learning platform in Sumbawa, this testing will further strengthen the platform's presence and its ability to reach and accommodate all educational aspirations.

This research offers novelty by developing and evaluating a dedicated e-learning platform for Samawa language learning using the webqual 4.0 and IPA approaches. Not only does it assess quality from a user perspective, but this research also contributes to efforts to preserve regional languages through technological approaches relevant to the needs and learning habits of today's young generation. Thus, this research not only expands the application of the WebQual 4.0 and IPA methods in a more specific context but also provides concrete solutions for preserving regional languages through effective digital media.

2. RESEARCH METHOD

The study employed a quantitative descriptive method. This method is used to describe population phenomena numerically. The WebQual 4.0 approach was used to assess the website's quality. The WebQual 4.0 instrument consists of three variables: usability, information quality, and interaction quality. Each variable describes crucial elements for assessing website quality, providing a

comprehensive overview of user perceptions. Meanwhile, the Importance-Performance Analysis (IPA) method was used to evaluate user satisfaction by comparing the importance and performance of each measured aspect. WebQual 4.0 was used to assess the quality of the Basa Samawa e-learning service. The e-learning created must, of course, be tested to assess how well the service meets the criteria of the WebQual 4.0 standard. After testing the Basa Samawa e-learning service, the priority level of the service expected to be improved next will be assessed using IPA analysis. The expected service quality will be compared with the performance of existing services to eventually establish a priority scale for improving the Basa Samawa e-learning service. The integrated use of WebQual 4.0 and IPA aims to provide a more comprehensive understanding of the factors influencing user satisfaction and to formulate more appropriate recommendations for improving service quality. Data processing was performed using SPSS and Microsoft Excel. The data obtained is converted to a Likert scale of 1-5, which will later be used for analysis to obtain conclusions from this research.

The population in this study comprises all teachers and students at the Elementary School and Junior High School levels in Sumbawa Regency who use the developed application. The sample in this study comprises 170 respondents, including 25 master teachers and 145 SD and SMP students in Sumbawa Regency. Validity and reliability testing were conducted on 50 respondents. The sampling technique used is purposive sampling, which selects participants based on specific criteria relevant to the research objectives. The aim is to ensure that all samples used meet the basic criteria and are suitable for the purpose of e-learning testing [12]. In this case, respondents were deliberately chosen because they are considered to have knowledge, experience, or direct involvement in using the application under study. This technique aims to obtain more in-depth data that aligns with the context of the research [13]. The flow of this research is illustrated in the flow diagram in Figure 1.

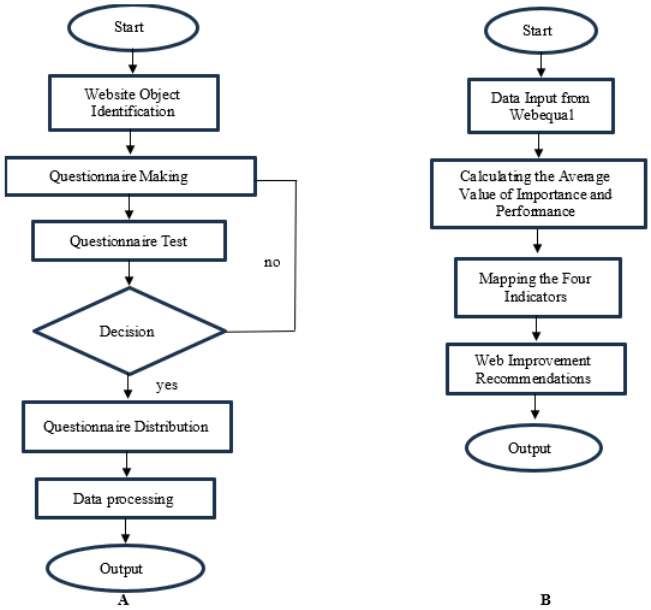

Figure 1. A. Webequal flowchart, Figure B. IPA flowchart

3. RESULT AND ANALYSIS

Before this research was conducted, the results were presented on building and using a responsive web-based e-learning application for learning the Samawa (Sumbawa) regional language. In making the application, the Samawa Language e-learning application was developed using the Rapid Application Development (RAD) framework, which consists of several stages: 1) Requirements Planning Phase, this phase involves developing a plan to identify the steps and needs involved in preserving the Sumbawa language. This phase involved Focus Group Discussions (FGDs) involving cultural activists, local content teachers at schools, and Information Technology practitioners. 2) User Design Phase, this phase involves designing the e-learning application using Structured Design to facilitate application design, context diagrams, data flow diagrams, entity-relationship diagrams, database structure designs, and display designs are utilized to produce a design ready for coding. 3) Construction Phase, this phase involves coding the e-learning application, where the application is built web-based using the Flutter Framework using the PHP programming language. 4) Cotuver Phase, this phase involves testing by IT experts. The following is a screenshot of the Samawa Language e-learning application on

http://e-bahasasamawa.id. Here is the main page of the Samawa Language E-learning application. Figure 2 shows the main page of the Samawa Language E-Learning application, which is web-based. This page serves as the primary entry point for users to familiarize themselves with the system's features. This initial display displays general information about learning the Samawa Language, the main navigation menu, and access to the user authentication process. The interface design is simple and responsive, suitable for a wide range of users, including students and the general public. The main page displays the results of the Construction Phase in the RAD method, with a primary focus on an easy-to-use, informative interface.

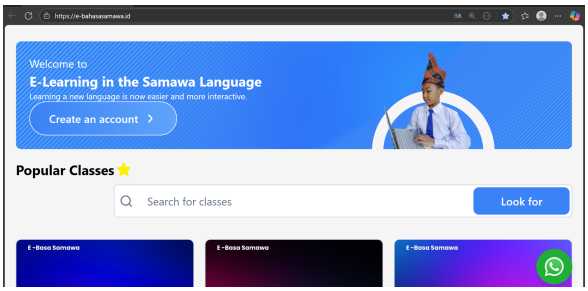

Figure 2. Samawa language E-learning application display

Figure 3 depicts the login page used for user authentication before accessing the learning features. This page ensures that only registered users can attend classes, take tests, and access learning materials. The login process involves entering the account data registered in the system. The existence of this login page is essential for supporting user data management, including recording learning outcomes and learning activities. This feature is part of the Cutover Phase, during which the system is used in production by end users.

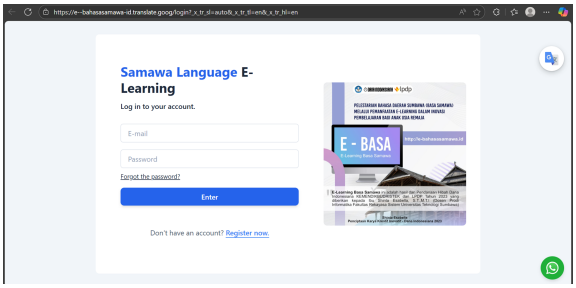

Figure 3. The login page in application

Figure 4 shows the pre-test page that users must complete before beginning the learning process. This pre-test aims to measure the user's initial proficiency in the Samawa language. The pre-test results serve as the basis for evaluating the effectiveness of the system's learning. The pre-test provides an overview of the user's initial level of understanding. This stage supports a structured, systematic learning-evaluation process in e-learning.

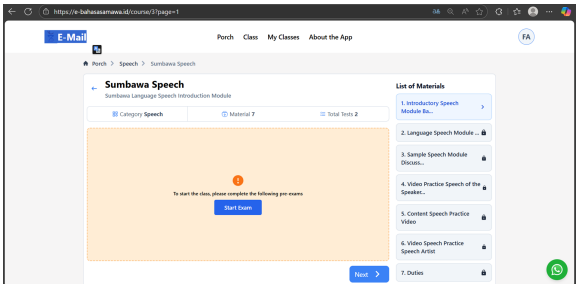

Figure 4. The pre-test page in application

Figure 5 presents the pre-test in multiple-choice format, with 20 questions randomly selected by the system. Each user is allotted up to 60 minutes to complete all questions. The system automatically manages the user's processing time and saves answers. Question randomization minimizes the possibility of cheating and increases the validity of test results. This feature demonstrates the application of the system logic developed during the Construction Phase of the RAD method.

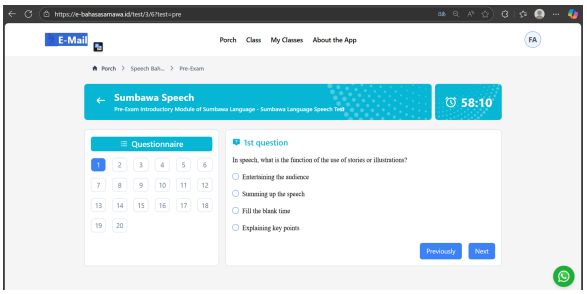

Figure 5. The Pre-Test Material in Application

Figure 6 illustrates the process of completing the learning assignments that users must complete after studying the material. The assignments involve creating a video in the Sumbawa language and uploading it via a link provided in the system. This mechanism allows users to directly practice their language skills. The assignments are then assessed by a Sumbawa Language Master Teacher as part of the learning evaluation. This feature supports practice-based learning and enhances interaction between users and instructors.

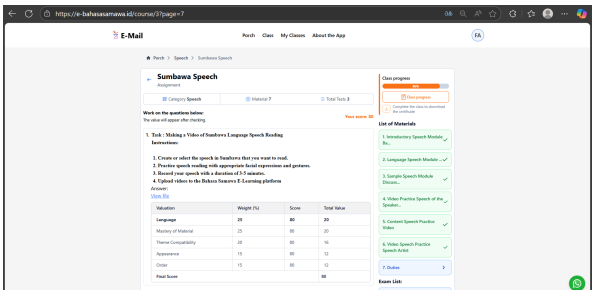

Figure 6. Assignment completion in the application

Figure 7 displays the final learning outcomes obtained by users after completing the entire process, from the pre-test to the post-test, including materials and assignments. Learning outcome scores are awarded by the Sumbawa Language Master Teacher based on predetermined criteria. Users who obtain a score above 75 points are deemed to have passed and successfully completed the learning in a specific category. This learning outcome information is stored in the system as an archive and evaluation material. This feature serves as an indicator of the success of e-learning implementation in improving user competency.

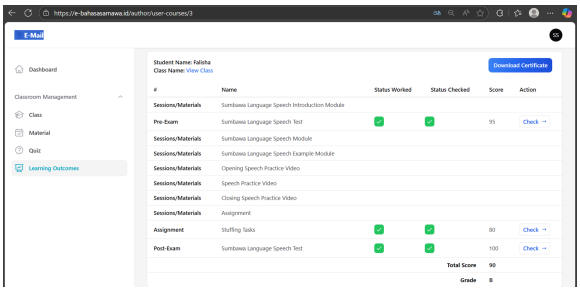

Figure 7. Sumbawa language learning outcomes in the application

After the e-learning application was developed, the first step was to assess its reliability using a questionnaire. The questionnaire was then tested for validity and reliability to ensure it was reliable and valid, and to prepare it for use as a data collection

instrument. The results of the validity and reliability test of the questionnaire obtained using the help of SPSS software are presented in the following Table 1. The calculated r value obtained in each Performance and Importance questionnaire will be compared with the table r value (5% significance). After comparison, the calculated r-value for each question item was greater than the table r-value, indicating that all question items in the questionnaire are valid and can be used.

Table 1. Questionnaire Validity Test Results

Variable	Indicator	R table	Performance webqual 4.0	Note	Importance Webqual 4.0	Note
Usability	A1	**0.150**	0.571	valid	0.661	Valid
	A2	**0.150**	0.645	valid	0.641	Valid
	A3	**0.150**	0.362	valid	0.462	Valid
	A4	**0.150**	0.789	valid	0.569	Valid
	A5	**0.150**	0.881	valid	0.683	Valid
	A6	**0.150**	0.652	valid	0.451	Valid
	A7	**0.150**	0.692	valid	0.652	Valid
Information Quality	B1	**0.150**	0.751	valid	0.671	Valid
	B2	**0.150**	0.772	valid	0.713	Valid
	B3	**0.150**	0.691	valid	0.591	Valid
	B4	**0.150**	0.815	valid	0.713	Valid
	B5	**0.150**	0.792	valid	0.542	Valid
	B6	**0.150**	0.735	valid	0.638	Valid
Interaction Quality	C1	**0.150**	0.673	valid	0.683	Valid
	C2	**0.150**	0.723	valid	0.421	Valid
	C3	**0.150**	0.584	valid	0.384	Valid
	C4	**0.150**	0.836	valid	0.635	Valid
	C5	**0.150**	0.589	valid	0.579	Valid

In addition to testing validity, another prerequisite for using a questionnaire is conducting a reliability test. The reliability test results are presented in Table 2. As with the validity test, the reliability test results in SPSS are compared with 0.6 as the threshold. A value more significant than the r table value is obtained, so that it can be concluded that both types of questionnaires are reliable and can be used as data collection tools that will later be processed to obtain conclusions that can be accounted for.

Table 2. Type Sizes for Final Papers

Variable	Alpha Cronbach
Performance	0.691
Importance	0.772

The data will then be processed using descriptive statistics to provide a description of the research data. The results of the descriptive analysis are obtained in Table 3. The perception values presented in Table 3 indicate the level of satisfaction among users of the e-learning application. The average value obtained for each indicator is relatively high.

Table 3. Results of Descriptive Analysis of User Perception

Variable	Min	Max	Std. Dev	Mean	Var
Usability	19	50	5.067	3.75	25.673
Information Quality	15	38	5.568	3.79	31.002
Interaction Quality	18	55	5.767	3.75	33.261

For the usability indicator, the average value is relatively high, at 4.775, although it is lower than the users' desired value shown in Table 4. Another value, namely the quality of information provided by e-learning, is in the good category, with a score of 3.861. Likewise, the quality of user interaction is rated in the satisfied category, with a score of 4.291. The value of this category is good based on the experience of e-learning users. These values are not much different from user expectations. The user expectation values for e-learning are shown in Table 4.

Table 4. Results of Descriptive Analysis of User Expectations

Variable	Min	Max	Std. Dev	Mean	Var
Usability	23	57	4.755	**3.82**	22.613
Information Quality	18	42	5.668	**3.87**	32.132
Interaction Quality	21	50	5.579	**3.83**	31.121

When comparing the perception value with the expectation value, the expectation value is still higher than the perception value. This indicates an expectation that users will benefit from feature enhancements and additions that make the e-learning easier to use. The quality of e-learning used by respondents is shown in Table 5. The quality values presented in Table 5 are satisfactory. Quality based on usability, which shows 75% satisfaction, illustrates that user satisfaction with the e-learning application is very high. Likewise, the information quality and interaction quality variables are 76% and 74.5%, respectively.

Table 5. Results of E-learning Quality

Variable	percentage	Std. Dev	Mean	Var
Usability	**75%**	**5.062**	**3.336**	**25.626**
Information Quality	76%	5.491	3.823	30.152
Interaction Quality	74.5%	5.218	3.231	27.231

These values describe desirable qualities based on respondents' assessments. The next stage of analysis is IPA, which will show the GAP between the expected and performance values. The results of the gap analysis are in Table 6. The average values of the Webqual 4.0 indicator variables across the 3 variables are -0.06 for usability, -0.08 for information quality, and -0.07 for interaction quality. The negative GAP values for the three variables tested indicate that the quality of Basa Samawa e-learning services has not met users' expectations and needs. Where the importance value is lower than the performance value. For the information quality variable that takes a positive value, this indicates that the variable has met users' perceptions and expectations. The negative value indicates that users of Basa Samawa E-learning consider several features important, but these features do not yet meet user expectations.

Table 6. Gap Analysis

Code	Indicator	Performance	Importance	GAP
A1	E-learning easy to learn how to use	3.68	3.75	-0.07
A2	Interaction between users and facilitators (teachers) in e-learning is easy	3.87	3.91	-0.04
A3	Easy navigation process	3.75	3.85	-0.10
A4	E-learning easy to use	3.69	3.74	-0.05
A5	Attractive e-learning display	3.70	3.73	-0.03
A6	E-learning access can be done at any time	3.89	3.94	-0.05
A7	This e-learning provides a positive experience for users	3.67	3.79	-0.12
Average of variable usability		3.75	3.82	-0.06
B1	The information provided by e-learning is accurate	3.72	3.89	-0.17
B2	The information provided by e-learning is reliable	3.89	3.89	0
B3	The information provided by e-learning is up to date	3.78	3.82	-0.04
B4	The information provided by e-learning is relevant	3.83	3.89	-0.06
B5	The information provided in e-learning is easy to understand	3.82	3.93	-0.11
B6	The information provided by e-learning is appropriate and correct	3.72	3.80	-0.08
Average of Information Quality		3.79	3.87	-0.08
C1	Good e-learning reputation	3.65	3.65	0
C2	E-learning provides a sense of security when interacting	3.69	3.79	-0.10
C3	User's personal information is safe	3.81	3.93	-0.12
C4	E-learning provides a wider space for me to express myself in the learning or teaching process.	3.74	3.83	-0.09
C5	It's quite easy to communicate with e-learning	3.88	3.92	-0.04
Average of Interaction quality		3.75	3.82	-0.07

The next step in analyzing the data is to analyze the quality of the gap between expectations and e-learning performance. The IPA graph is divided into four quadrants, each of which has its own meaning. Quadrant I shows the main priority, quadrant II is

a performance defense, quadrant III shows a low priority, and quadrant IV means excessive [5]. The results of the IPA quadrant diagram analysis for e-learning are presented in Figure 8.

Figure 8 is a picture of the distribution of the IPA value indicators of the variables measured in respondents. It can be seen in Quadrant 1 indicators B1 and A3, which means that these indicators are very important for e-learning users, but the performance displayed is not in accordance with user expectations. In quadrant 2, there are seven indicators, namely C3, B5, B4, A2, A6, C5 and B2. The indicators in quadrant 2 illustrate that the quality of these seven indicators is considered appropriate and needs to be maintained and even improved. Quadrant 3 is spread across eight indicators, namely C1, A1, A4, A5, A7, C2, B6, and C4. These eight indicators are actually indicators that are not considered necessary by respondents, so improvements for these eight indicators are not a top priority. Quadrant 4 has one indicator left, namely B3. Quadrant 4 shows the excessive performance of the e-learning website, which is considered unimportant by respondents.

The distribution of indicators in the four quadrants can show which indicators need to be maintained and improved for the perfection of e-learning in the future. The distribution of indicators in quadrants III and IV affects the value of user satisfaction. The results of this analysis are in line with the results that have been carried out by previous researchers regarding the use of WebQual 4.0 4.0 and IPA can measure user performance and expectations well and optimally [7, 10, 14, 15].

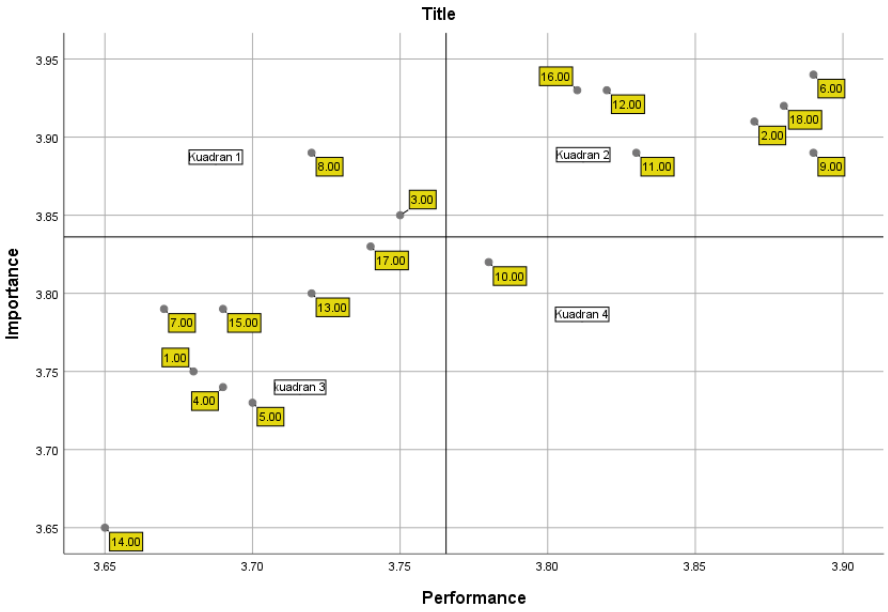

Figure 8. Importance performance analysis quadrant diagram

4. CONCLUSION

Based on the results of the WebQual 4.0 analysis, the quality of Sumbawa language e-learning is in the good category, with an average performance value of 3.76. This value differs slightly from the average expectation (important), which is 3.84. The average GAP value is -0.02. Based on these results, it can be concluded that several improvements and developments need to be made in several features, namely, Interactive Feature Development, such as Applications can be developed by adding interactive features (discussion forums, comment columns on materials, or question and answer features between students and teachers to make the learning process more active and communicative). Furthermore, development can be on multimedia content by enriching learning materials such as Sumbawa language pronunciation audio, animations, and more diverse videos to increase adolescent learning interest, and the use of Sumbawa language e-learning can be expanded in order to preserve cultural heritage. In conclusion, although the results indicate several items in the good category, further improvements are needed across several variable categories, namely information quality, service interaction, and usability.

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6. DECLARATIONS

AI USAGE STATEMENT

During the preparation of this work, the author used ChatGPT (OpenAI) to improve the manuscript's language and clarity. Afterusing this tool, the author reviewed and edited the content as needed and takes full responsibility for the publication's content.

AUTHOR CONTIBUTION

Shinta Esabella, Conceptualization, Methodology, Writing - Initial Draft. Tri Susilawati, Data Curation, Formal Analysis, Visualization. Titi Andriani, Validation, Writing. Yana Karisma, Language Review. Muhammad Hidayatullah, Editing. Gunawan, Supervision, Project Administration, Final Approval of Manuscript.

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COMPETING INTEREST

The authors declare that they have no financial or personal conflicts of interest that could influence the results of this study.

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