

The Effect of WebQual 4.0 Dimensions on SIMPONI User Satisfaction

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ABSTRACT

Universities increasingly run academic administration through dedicated web applications, yet the quality of these non-learning systems is rarely evaluated from the student's point of view. SIMPONI, the web-based academic administration application used at Universitas Multi Data Palembang, is one such case: students rely on it for course schedules, service requests, and attendance records, but its perceived quality had not previously been measured. This study analyzes the effect of the three WebQual 4.0 dimensions, usability quality, information quality, and service interaction quality, on user satisfaction with SIMPONI. A questionnaire covering sixteen WebQual 4.0 items and one satisfaction item was distributed by random sampling among 1,878 active users of SIMPONI version 1.46.4, yielding 236 usable responses. All items passed validity testing (corrected item-total correlation 0.694-0.859 against an r-table of 0.1277) and reliability testing (Cronbach's alpha of 0.957), after which the data were analyzed with multiple linear regression in SPSS. Usability quality, information quality, and service interaction quality each had a positive, significant effect on user satisfaction ($p < .001$ for all three) and jointly accounted for 59.3 percent of its variance. Usability quality carried the largest weight, with a standardized beta of 0.322. SIMPONI is well regarded by the students who use it, particularly for ease of use, while its service interaction quality is the dimension with the most room to improve. The study extends WebQual 4.0 research beyond e-learning platforms into non-LMS academic administration systems and gives SIMPONI's developers an evidence-based starting point for future development.

INTRODUCTION

Universities increasingly deliver academic administration through dedicated web applications rather than paper-based counters or general-purpose portals. At Universitas Multi Data Palembang, this function is served by SIMPONI, a system students use to check course schedules, submit administrative requests, and track their own attendance and academic history. The system sits outside what most people mean by a learning management system: it does not host course materials or deliver instruction, and its value to students depends entirely on how well it handles the administrative side of academic life (Dwiyatno et al., 2022; Oktaviana et al., 2024)

That value cannot be assumed. A system that is hard to navigate, or that returns unclear or outdated information, or that fails when a student needs more than to browse it, undermines the efficiency it exists to provide. Quality, in this sense, is not a property of the code but of the interaction between the system and the person using it, and it can only be established by asking users. WebQual 4.0 was built for that question. Introduced by (Mardiana, 2023), the instrument separates website quality into three components a user experiences: usability quality, how easily the system can be operated; information quality, how much the information it presents can be trusted; and service interaction quality, how well the system holds up when a transaction, not just browsing, is required. The three dimensions were designed for e-commerce sites, but subsequent research has carried them across government portals, social platforms, and, increasingly, campus systems, which suggests they capture something general about how people judge a digital service rather than something specific to online shopping.

Most WebQual 4.0 research in Indonesian higher education, however, has targeted e-learning platforms and learning management systems rather than administrative applications like SIMPONI. The two kinds of system are not interchangeable in what they ask of a user. A learning platform is judged on how well it sustains engagement with course content over a semester; an administration application is judged on whether a short, specific task, checking a schedule, filing a request, gets done without friction. Even the studies that do move beyond websites to applications proper, such as (Pujiastuti et al., 2023) evaluation of a corporate storage application, still leave academic administration systems unexamined. Evaluating SIMPONI on its own terms, rather than extrapolating from e-learning findings, is the gap this study addresses.

This study analyzes the effect of the three WebQual 4.0 dimensions, usability quality, information quality, and service interaction quality, on student satisfaction with SIMPONI. Two things follow from closing this gap. First, it tests



whether a framework built for e-commerce and refined on e-learning platforms still applies when the platform's task is administrative rather than transactional or instructional, extending the boundary of what WebQual 4.0 has actually been shown to measure. Second, and more immediately useful to the university, the results give SIMPONI's developers an evidence-based basis for prioritizing future improvements, rather than one built on assumption or isolated complaints.

LITERATURE REVIEW

WebQual 4.0's three dimensions turn up as significant predictors of satisfaction across a fairly wide range of educational platforms, though the specific weak spot differs from one study to the next. (Fauziah et al., 2023) found usability, information quality, and service interaction quality all rated positively on an e-learning site and all significantly linked to satisfaction. (Purwandani & Syamsiah, 2021) reached a similar conclusion on a different e-learning system, with none of the three dimensions standing out as a problem. (Yang et al., 2024) evaluated the e-learning website of Universitas Papua and found a comparable overall picture, but with one caveat the other two studies did not raise: access speed and display consistency lagged behind the rest of the dimensions and needed attention. Read together, these three studies suggest that WebQual 4.0's dimensions travel reasonably well across different e-learning platforms, but that a good overall score can still hide a specific technical weakness worth checking for.

Outside of e-learning, the pattern shifts slightly toward usability and information quality carrying more of the weight, though not always in the same direction. (Sebayang et al., 2023) measured a local government website and found usability and information quality contributing the most to satisfaction, with service interaction quality, mainly system responsiveness and reliability, trailing behind. (Suharto & Hariadi, 2021) reported nearly the same ranking for a human resource development agency's website. (Nasution & Enda, 2025) went further and tested all three dimensions simultaneously on a public institution's website, concluding that they jointly and significantly predicted satisfaction, with ease of use and information clarity doing most of the explanatory work. Two commercial studies complicate this otherwise consistent picture. (Athallah & Kraugusteeliana, 2022), evaluating a telecommunications company's website with WebQual 4.0 paired with Importance Performance Analysis, found real gaps between what users expected and what the site delivered, particularly around access speed and information clarity, gaps that a WebQual 4.0 score alone would not have surfaced. (Ariestya et al., 2024), by contrast, modeled WebQual 4.0's effect on satisfaction directly for a different telecommunications provider's website, the same structure this study uses, without an importance-performance layer, and still found the three dimensions predicted satisfaction on their own. (Mustikarani & Karyati, 2024) tested the same direct model on a social content platform and reported an even higher coefficient of determination, 75 percent, though their study flagged information quality specifically as the dimension most in need of improvement, the opposite of what several of the studies above found for their own platforms.

Studies of higher education websites, meanwhile, tend to pair WebQual 4.0 with Importance Performance Analysis for one reason: a mean score shows how a dimension is currently perceived, but only a performance-importance comparison shows whether that level of performance is enough for the user. (Handika et al., 2022) used this combination on a university e-learning website to identify improvement priorities that ranking dimensions by mean score alone would have missed. (Murdoko & Jatnika, 2024) applied the same pairing to a university's academic information website with comparable results. (Safitri et al., 2024) evaluated a university faculty website: even indicators with high absolute scores can still show a gap between what students expect and what they experience. (Pujiastuti et al., 2023) took the framework somewhere none of these studies did, applying it to a corporate file-storage application rather than a public-facing website, which matters here because SIMPONI is likewise an application built for internal institutional use rather than a marketing or content site.

Taken as a whole, this body of work supports two claims relevant to the present study. First, the three WebQual 4.0 dimensions are reliable predictors of user satisfaction across educational, governmental, and commercial web services, and the studies that model this relationship directly, without an importance-performance layer, still find it holds, which justifies using the same direct approach here. Second, every one of these studies was conducted on either an e-learning platform, a government website, a commercial site, or, in one case, an internal corporate application, none evaluated a non-LMS academic administration application, where the user's task is transactional rather than instructional. SIMPONI sits in that unexamined category, and closing that gap is what this study sets out to do.

Table 1. Summary of Prior WebQual 4.0 Studies

Study	Object	Method	Key finding
(Fauziah et al., 2023)	E-learning website (higher education)	WebQual 4.0	All three dimensions positive and significant on satisfaction
(Purwandani & Syamsiah, 2021)	E-learning system (UBSI)	WebQual 4.0	Favorable scores across all three dimensions
(Yang et al., 2024)	E-learning website (UNIPA)	WebQual 4.0	Generally favorable; access speed and display consistency needed improvement
(Sebayang et al., 2023)	Local government website	WebQual 4.0	Usability and information quality most influential; service interaction lagging
(Suharto & Hariadi, 2021)	HR development agency	WebQual 4.0	Usability and information quality ranked



2021)	website		highest
(Nasution & Enda, 2025)	Public institution website	WebQual 4.0	All three dimensions jointly significant
(Athallah & Kraugusteeliana, 2022)	Telecommunications company website	WebQual 4.0 + IPA	Gaps between expectation and performance on speed and information clarity
(Ariestya et al., 2024)	Telecommunications company website	WebQual 4.0	All three dimensions predict satisfaction directly
(Mustikarani & Karyati, 2024)	Social content platform	WebQual 4.0 + IPA	R Square = 75%; information quality flagged for improvement
(Handika et al., 2022)	University e-learning website	WebQual 4.0 + IPA	Identified improvement priorities beyond mean scores
(Murdoko & Jatnika, 2024)	University academic information website	WebQual 4.0 + IPA	Pinpointed specific attributes needing attention
(Safitri et al., 2024)	University faculty website	WebQual 4.0 + IPA	High scores can still hide expectation gaps
(Pujiastuti et al., 2023)	Corporate file-storage application	WebQual 4.0	Extended the framework beyond public websites to an internal application

METHOD

This study follows the WebQual 4.0 framework developed by (Mardiana, 2023), which operationalizes website quality through usability quality, information quality, and service interaction quality. The same three-dimension structure, used directly against a satisfaction outcome rather than layered with an importance-performance comparison, has held up in unrelated commercial settings (Ariestya et al., 2024; Mustikarani & Karyati, 2024), which supports applying it here without modification.

Each dimension was translated into questionnaire items scored on a five-point Likert scale, from strongly disagree to strongly agree. Table 2 lists all sixteen WebQual 4.0 items together with the single user satisfaction item, adapted from instruments used in prior WebQual 4.0 studies on Indonesian web platforms. Usability quality covers ease of learning, ease of use, navigation, interface clarity, visual appeal, and conformity to conventional e-learning site design; information quality covers accuracy, trustworthiness, currency, comprehensibility, level of detail, and appropriateness of format; service interaction quality covers reputation, perceived safety of personal data, perceived safety of transactions, and fit between the service and the user's needs. User satisfaction was captured with a single overall item asking respondents how satisfied they were with SIMPONI's quality as a whole.

Table 2. WebQual 4.0 Instrument Items

Dimension	Code	Item statement
Usability quality	UQ1	SIMPONI is easy to learn to operate
Usability quality	UQ2	SIMPONI is easy to use
Usability quality	UQ3	SIMPONI is easy to navigate
Usability quality	UQ4	SIMPONI is clear and easy to understand
Usability quality	UQ5	SIMPONI has an attractive appearance
Usability quality	UQ6	SIMPONI is consistent with typical e-learning website design
Information quality	IQ1	SIMPONI provides accurate information
Information quality	IQ2	SIMPONI provides trustworthy information
Information quality	IQ3	SIMPONI provides current and relevant information
Information quality	IQ4	SIMPONI provides information that is easy to understand
Information quality	IQ5	SIMPONI provides information in adequate detail
Information quality	IQ6	SIMPONI presents information in an appropriate format
Service interaction quality	SIQ1	SIMPONI has a good reputation
Service interaction quality	SIQ2	I feel safe storing personal data in SIMPONI
Service interaction quality	SIQ3	I feel safe carrying out activities in SIMPONI
Service interaction quality	SIQ4	SIMPONI provides service that fits my needs
User satisfaction	US	Overall, I am satisfied with SIMPONI's quality

The population consisted of 1878 active students of Universitas Multi Data Palembang who use SIMPONI version 1.46.4. Sample size was set using Slovin's formula with a five percent margin of error (Adhikari, 2021), which yields a minimum of approximately 330 respondents; random sampling was used so that every student in the population had an equal chance of being selected. The questionnaire was distributed both online, and after screening for completeness, 236 valid responses remained for analysis, below the Slovin target but above the threshold typically considered adequate for regression analysis with three predictors.

Before testing the hypotheses, the sixteen WebQual 4.0 items were checked for validity using corrected item-



total correlation and for reliability using Cronbach's alpha, following standard practice for quantitative instruments (Subhaktiyasa, 2024). An item was treated as valid if its corrected item-total correlation exceeded the r-table value for 236 respondents, 0.1277, and the instrument as a whole was treated as reliable if Cronbach's alpha exceeded 0.70.

Once the instrument's validity and reliability were established, the analysis proceeded in three stages. First, each respondent's items were averaged within their dimension to produce three scores, usability quality (X1), information quality (X2), and service interaction quality (X3), alongside the single user satisfaction score (Y). Second, these four variables were entered into a multiple linear regression in SPSS, with Y as the dependent variable and X1, X2, and X3 as predictors. Multiple linear regression was chosen over partial least squares structural equation modeling, an approach used in some recent studies of similar designs (Demir & Uşak, 2025), because Y here is a single observed item rather than a multi-item latent construct, which rules out the kind of measurement model PLS-SEM is built to estimate. Third, the resulting model was evaluated using the coefficient of determination for its overall explanatory power, the F-test for the predictors' joint effect, the t-test for each predictor's individual effect, and the variance inflation factor to rule out multicollinearity among the three predictors.

Participation was voluntary and anonymous. Respondents were informed of the study's purpose before completing the questionnaire, and consent was implied by their choice to proceed; no personally identifying information beyond what was needed to confirm active SIMPONI use was collected.

RESULT

Corrected item-total correlations for the sixteen WebQual 4.0 items ranged from 0.694 to 0.859, above the r-table value of 0.1277 for 236 respondents, so every item was retained as valid. Cronbach's alpha for the full instrument was 0.957, indicating excellent internal consistency (Table 3).

Table 3. Validity and Reliability Summary

Test	Result
Number of items	16
Corrected item-total correlation range	0.694 - 0.859
r-table (n = 236, alpha = 0.05)	0.1277
Validity status	All items valid
Cronbach's alpha	0.957
Reliability status	Excellent (reliable)

Dimension means, summarized in Table 4, place all four variables above 4.3 on the five-point scale: 4.386 for usability quality, 4.424 for information quality, 4.313 for service interaction quality, and 4.331 for user satisfaction.

Table 4. Descriptive Statistics of WebQual 4.0 Dimensions and User Satisfaction

Dimension	Mean	Category
Usability quality (X1)	4.386	Very good
Information quality (X2)	4.424	Very good
Service interaction quality (X3)	4.313	Very good
User satisfaction (Y)	4.331	Very good

The regression model as a whole performed well. As shown in Table 5, R was 0.770 and R Square was 0.593 (adjusted R Square = 0.588), meaning the three WebQual 4.0 dimensions jointly account for 59.3 percent of the variance in user satisfaction. The F-test returned $F = 112.625$ at a significance level below .001, confirming that the three dimensions predict user satisfaction simultaneously and significantly.

Table 5. Model Summary and ANOVA of the Multiple Linear Regression

Statistic	Value
R	0.770
R Square	0.593
Adjusted R Square	0.588
F	112.625
Sig. (F)	< .001

Individually, all three predictors were significant as well. Table 6 reports usability quality ($B = 0.317$, $\text{Beta} = 0.322$, $t = 5.748$, $p < .001$), information quality ($B = 0.294$, $\text{Beta} = 0.278$, $t = 3.708$, $p < .001$), and service interaction quality ($B = 0.278$, $\text{Beta} = 0.267$, $t = 3.698$, $p < .001$), giving the regression equation $Y = 0.441 + 0.317X1 + 0.294X2 + 0.278X3$. Variance inflation factors of 1.783, 3.211, and 2.981 for X1, X2, and X3 respectively stayed well under the conventional threshold of 10, so multicollinearity was not a concern.

Table 6. Regression Coefficients and Collinearity Statistics

Variable	B	Beta	t	Sig.	VIF
(Constant)	0.441	-	2.061	.040	-
Usability quality (X1)	0.317	0.322	5.748	< .001	1.783
Information quality (X2)	0.294	0.278	3.708	< .001	3.211
Service interaction quality (X3)	0.278	0.267	3.698	< .001	2.981

DISCUSSION

SIMPONI comes out of this analysis well regarded by the students who use it: all three WebQual 4.0 dimensions average above 4.3 on a five-point scale. Information quality scored highest, so students trust the accuracy and clarity of what the system tells them more than any other aspect of it. Service interaction quality scored lowest of the three. That does not mean it scored poorly; it means the dimension has the clearest room to improve, whether through stronger perceived data security, more reliable service delivery, or faster system response.

Usability quality was the strongest predictor of satisfaction, ahead of information quality and service interaction quality. That ordering matches what (Sebayang et al., 2023) and (Nasution & Enda, 2025) found on government and public-service websites, and it fits (Fauziah et al., 2023) finding that all three WebQual 4.0 dimensions shape satisfaction on an e-learning site. The pattern holds across commercial, governmental, educational, and now administrative platforms: ease of use functions as something close to a baseline expectation for institutional digital services, whatever the service is for.

The 59.3 percent figure is worth placing next to comparable studies rather than reading in isolation. (Mustikarani & Karyati, 2024) found the same three dimensions explained 75 percent of satisfaction with a social content platform, well above what this study found for SIMPONI. The gap is plausible rather than troubling: a content platform's entire function is the content experience WebQual 4.0 measures, while an academic administration application also depends on things WebQual 4.0 does not ask about, how the university processes the request behind the interface, for instance, once a student submits one. That distinction may explain why 40.7 percent of the variance in SIMPONI's user satisfaction remains unexplained. WebQual 4.0's three dimensions are evidently not the whole story for this kind of system. (Athallah & Kraugusteliana, 2022) and (Safitri et al., 2024) both documented websites that scored well on WebQual 4.0 dimensions yet still fell short of what users expected, a gap their studies could see only because they also collected importance data alongside performance data. This study did not, and that is its most consequential limitation.

Three specific constraints follow from that gap. User satisfaction was measured with a single item rather than a multi-item construct, which ruled out testing its validity and reliability and confined the analysis to observed-variable regression instead of a latent-variable model. Without importance or expectation data, the study cannot say whether SIMPONI's already-strong usability score is strong enough relative to what students actually want, only that usability matters more than the other two dimensions do. And the sample came from one university's student body using one version of one application, so how far these findings generalize to other academic administration systems remains an open question.

None of this changes what SIMPONI's developers can act on now. The dimension-level means already point to where effort is best spent: service interaction quality, specifically the security and reliability of the interactions students have with the system, rather than a wholesale overhaul of the interface or its content. That is a narrower, cheaper intervention than redesigning the system from scratch, and it is the one the data actually support.

The broader point extends past SIMPONI itself. Universitas Multi Data Palembang is one of many Indonesian institutions running a non-LMS administrative application alongside its learning platforms, and most of them face the same absence of systematic, user-facing quality evaluation this study found for SIMPONI before now. If usability quality is as close to a baseline expectation as the cross-platform pattern here suggests, other institutions running comparable systems have a reasonably cheap first place to look: not a full technical audit, but a short WebQual-style survey of the students who use the system every week.

CONCLUSION

This study set out to determine whether WebQual 4.0's three dimensions, usability quality, information quality, and service interaction quality, affect student satisfaction with SIMPONI, a non-LMS academic administration application at Universitas Multi Data Palembang. Based on 236 active users, the answer is yes on all three counts: each dimension had a positive, significant effect on satisfaction, individually and jointly, together explaining 59.3 percent of its variance. Usability quality mattered most, which points to ease of use as the primary lever available to whoever maintains SIMPONI, ahead of information quality and service interaction quality.

The practical reading of these results is that SIMPONI does not need a wholesale redesign. Its users already rate it favorably across all three dimensions, and the most useful next step is targeted rather than sweeping: strengthening service interaction quality specifically, through better perceived data security and more responsive service delivery, while protecting the usability and information quality the application has already earned credit for.

The broader contribution is that a framework built for e-commerce sites and refined mainly on e-learning platforms still predicts satisfaction when the underlying system is neither: SIMPONI is an administrative tool, not a storefront or a course, and WebQual 4.0's three dimensions held up regardless. That is one data point, not a settled generalization, and the honest next step is to test it further rather than assume it. Future work could extend this study by collecting importance data alongside performance data to run a proper Importance-Performance Analysis, replacing the single-item satisfaction measure with a multi-item construct, and testing predictors beyond WebQual 4.0's three dimensions to account for the substantial share of variance this study left unexplained.

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AUTHOR CONTRIBUTIONS

Conceptualization, supervision, and project administration: Chriestina. Methodology, formal analysis, and writing (original draft): Ahmad Farisi. Methodology validation and statistical review: Dafid. Data curation and investigation: Adit Jansa. All authors reviewed and approved the final manuscript.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ETHICS DECLARATION

This study involved anonymous, voluntary survey responses from adult university students and did not collect sensitive personal data. All respondents were informed of the study's purpose prior to participation.

DATA AVAILABILITY STATEMENT

The questionnaire data analyzed in this study are available from the corresponding author upon reasonable request.

AI DISCLOSURE STATEMENT

Generative AI (Claude, Anthropic) was used to assist with data organization, drafting, and language editing during manuscript preparation. All research design choices, data analysis, interpretation, and conclusions are the authors' own responsibility.

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