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# Usability Evaluation of a Mobile-Based Academic Information System Using the System Usability Scale

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**ABSTRACT**

The increasing adoption of mobile technology in higher education has encouraged universities to implement mobile-based academic information systems to facilitate access to academic services. However, the availability of digital services does not necessarily guarantee that an application is easy to use or meets users' needs. Therefore, usability evaluation is essential to assess users' perceptions and identify opportunities for system improvement. This study aims to evaluate the usability of a mobile-based academic information system using the System Usability Scale (SUS). A quantitative descriptive research approach is employed to measure users' perceived usability through a standardized questionnaire consisting of ten statements with a five-point Likert scale. The research procedure includes participant selection, questionnaire distribution, response validation, SUS score calculation, and interpretation of the results using established usability benchmarks. The analysis focuses on the overall usability score and users' perceptions of system complexity, ease of use, consistency, and learnability. The results are intended to provide an objective basis for understanding the perceived usability of the application and identifying areas that may require further improvement. This study is expected to contribute to the development of more accessible, efficient, and user-centered academic information systems in higher education. The findings may also support developers and university administrators in making informed decisions regarding interface design and the continuous improvement of digital academic services.

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## 1. INTRODUCTION

The development of information technology has significantly transformed the delivery of services in higher education institutions[1]. One of the most notable developments is the implementation of academic information systems that support various academic activities, including course registration, class scheduling, grade reporting, attendance monitoring, and access to academic announcements. These systems enable universities to manage academic information more efficiently while providing students and lecturers with convenient access to essential services[2]. As the use of smartphones continues to increase, many higher education institutions have adopted mobile-based academic information systems to improve accessibility, flexibility, and the overall quality of academic services[3].

Mobile-based academic information systems offer several advantages over conventional desktop-based platforms[4]. Through mobile devices, students can access academic information anytime and anywhere without being restricted to a particular location or computer[5]. This flexibility is particularly important in modern higher education environments, where students require timely and reliable access to academic information[6]. However, the effectiveness of these systems does not depend solely on the availability of features or technological infrastructure. Their success also depends on how easily users can understand, navigate, and operate the application to accomplish their academic tasks. Therefore, usability has become an essential factor in evaluating the quality of mobile-based academic information systems[7].

Usability refers to the extent to which a system can be used by specified users to achieve specified goals effectively, efficiently, and satisfactorily within a particular context of use[8]. In the context of mobile academic applications, usability includes several aspects, such as ease of navigation, clarity of information, consistency of interface design, responsiveness, and simplicity of completing academic tasks. A system with poor usability may cause confusion, increase the time required to complete tasks, and reduce user satisfaction[9]. For example, students may experience difficulties when searching for course schedules, checking examination results, or accessing registration services if the application's interface is complicated or its information architecture is unclear. Such difficulties can negatively affect users' perceptions of the system and reduce their willingness to use it consistently[10].

Evaluating usability is therefore necessary to identify potential problems and determine whether a mobile-based academic information system meets users' needs and expectations[11]. Several usability evaluation methods can be employed, including heuristic evaluation, usability testing, interviews, and standardized questionnaires. Among these methods, the System Usability Scale (SUS) is widely recognized as a practical instrument for assessing perceived usability. Developed by John Brooke in 1986, SUS consists of ten statements designed to measure users' subjective assessments of a system's usability. Respondents indicate their level of agreement with each statement using a five-point Likert scale. The responses are then converted into a score ranging from 0 to 100, providing an overall indication of perceived usability[12]. Although the resulting score is expressed on a scale of 0 to 100, it should not be interpreted as a percentage. Instead, it can be interpreted using established benchmarks and relevant contextual considerations.

The SUS instrument offers several advantages for evaluating mobile-based academic information systems. It is relatively short, easy to administer, and applicable to different types of interactive systems[13]. Furthermore, its standardized structure facilitates comparisons across applications and user groups when appropriate methodological conditions are maintained. By collecting responses from students and other relevant users, researchers can obtain quantitative evidence regarding the perceived usability of an academic application. The resulting scores can help identify whether the system is generally perceived as easy to use and whether further investigation or interface improvements may be necessary[14]. Nevertheless, SUS primarily measures perceived usability and does not independently identify the specific interface problems responsible for a low score. Consequently, its results should be interpreted carefully and, when possible, complemented by additional user feedback or task-based observations[15].

Despite the growing adoption of mobile technologies in higher education, the usability of academic information systems remains an important area of investigation. The availability of mobile applications does not automatically guarantee that users can operate them effectively or feel satisfied with their experience. Differences in interface design, user familiarity, system performance, and the complexity of academic tasks may influence perceived usability. A systematic evaluation is therefore required to provide evidence-based insights into the strengths and potential weaknesses of these applications. Applying a standardized instrument such as SUS can support a structured assessment and provide a measurable basis for evaluating user perceptions.

Based on this background, this study aims to evaluate the usability of a mobile-based academic information system using the System Usability Scale. Specifically, the study seeks to measure users' perceived usability, calculate the overall SUS score, and interpret the results using relevant usability benchmarks. The findings are expected to provide an overview of the system's usability from the users' perspective and serve as a basis for identifying opportunities for improvement. In practical terms, the results may assist developers and higher education administrators in prioritizing interface enhancements and improving the accessibility of academic services. In academic terms, this study contributes to the application of standardized usability evaluation methods in the context of mobile-based academic information systems. Ultimately, improving usability is expected to support a more effective, efficient, and satisfactory digital academic experience for students and other system users.

## 2. RESEARCH METHOD

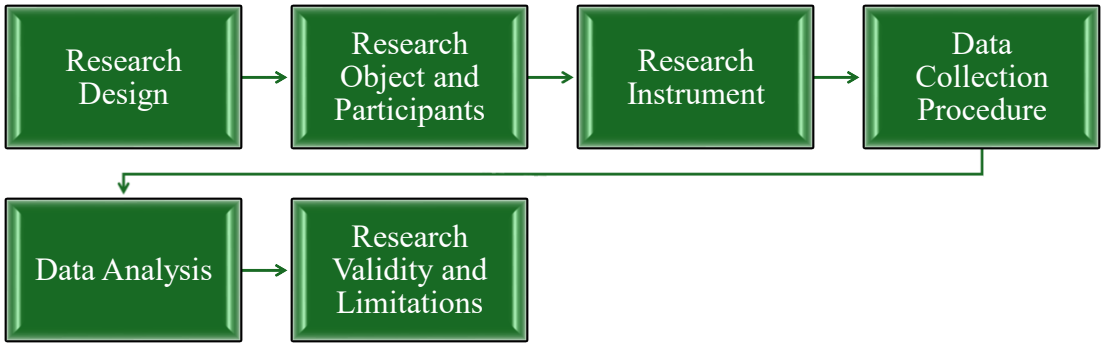



**Figure 1.** Stage Of Research

### 2.1. Research Design

This study employs a quantitative descriptive research design to evaluate the usability of a mobile-based academic information system using the System Usability Scale (SUS). A quantitative approach is selected because it enables the collection and analysis of numerical data representing users' perceptions of the system's usability. The descriptive design is intended to provide an overview of how users perceive the ease of use, complexity, consistency, and overall usability of the application without manipulating the system or its operating environment. The evaluation focuses on the experiences of users who interact with the academic information system to perform academic activities, such as checking class schedules, accessing academic announcements, viewing grades, and obtaining other academic information.

The SUS questionnaire serves as the primary instrument for measuring perceived usability. The evaluation procedure consists of identifying eligible respondents, administering the questionnaire, processing the responses, calculating individual SUS scores, and interpreting the overall results using established usability benchmarks. This procedure provides a systematic basis for assessing the usability of the application and identifying whether further improvements may be necessary.

### 2.2. Research Object and Participants

The object of this study is a mobile-based academic information system used to support academic services in a higher education institution. The system is evaluated from the perspective of its users, particularly students who regularly access academic information through mobile devices. Depending on the research context, lecturers or academic administrative staff may also be included if they use the same application and are relevant to the research objectives. Participants are selected using purposive sampling, a non-probability sampling technique in which respondents are chosen according to predetermined criteria. The inclusion criteria may consist of being an active student at the institution, having access to the mobile academic information system, and having used the application sufficiently to provide informed evaluations.

Respondents should have direct experience with the system so that their answers reflect actual interactions rather than assumptions. The target sample size should be determined according to the study's objectives, population characteristics, available resources, and methodological requirements. The final number of participants must be reported based on the actual data collected. Before participating, respondents are informed about the purpose of the study, the voluntary nature of their participation, and the confidentiality of their responses. No personally identifying information should be collected unless it is necessary and appropriately protected.

### 2.3. Research Instrument

The primary research instrument is the System Usability Scale, developed by John Brooke in 1986. SUS is a standardized questionnaire consisting of ten statements designed to measure users' perceived usability of a system. The instrument contains both positively and negatively worded statements to capture different aspects of the user experience. Respondents evaluate each statement using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire addresses aspects such as the frequency of system use, perceived complexity, ease of learning, integration of system functions, consistency, and confidence when using the application.

The questionnaire may be administered electronically through an online survey platform or in another accessible format. If the questionnaire is translated into Indonesian, the translation should preserve the original

meaning of each statement. Any translation or adaptation should be documented to maintain transparency and support the validity of the evaluation. Additional demographic questions may be included when relevant, but the ten SUS items remain the basis for calculating the usability score.

### 2.4. Data Collection Procedure

Data collection is conducted through several stages. First, the researcher identifies the academic information system to be evaluated and establishes the eligibility criteria for participants. Second, eligible respondents are invited to participate and receive an explanation of the research objectives and procedures. Third, respondents are asked to use or reflect on their actual experience with the application before completing the SUS questionnaire. Where appropriate, participants may be instructed to perform representative academic tasks, such as checking a course schedule or locating academic announcements, to ensure that their evaluations are based on relevant interactions.

Fourth, respondents complete the questionnaire independently. The researcher checks the submitted responses for completeness and consistency without altering the participants' original answers. Incomplete or invalid responses are handled according to predefined data-screening criteria. Finally, the eligible responses are compiled into a dataset for quantitative analysis. Data collection should continue until the predetermined sample target or justified sampling plan has been fulfilled.

### 2.5. Data Analysis

The collected data are analyzed using descriptive statistical techniques. The primary analysis involves calculating the SUS score for each valid questionnaire. The scoring procedure follows the standard SUS calculation method. For positively worded items (items 1, 3, 5, 7, and 9), the contribution score is obtained by subtracting 1 from the respondent's answer. For negatively worded items (items 2, 4, 6, 8, and 10), the contribution score is calculated by subtracting the respondent's answer from 5.

The contribution scores from all ten items are then added together and multiplied by 2.5 to obtain the final SUS score, which ranges from 0 to 100. The formula is expressed as follows:

$$SUS = 2.5 \times [(Q1 - 1) + (5 - Q2) + (Q3 - 1) + (5 - Q4) + (Q5 - 1) + (5 - Q6) + (Q7 - 1) + (5 - Q8) + (Q9 - 1) + (5 - Q10)]$$

In this formula, Q1 to Q10 represent the responses to the ten SUS questionnaire items.

After calculating individual scores, the mean SUS score is obtained by dividing the sum of all valid individual SUS scores by the number of valid respondents. The mean score is subsequently interpreted using appropriate SUS benchmarks and, where relevant, adjective ratings or acceptability categories. A score around 68 is commonly used as a reference benchmark in SUS literature, although interpretation depends on the comparison dataset and evaluation context. The score is not a percentage and should not be interpreted as the proportion of satisfied users.

### 2.6. Research Validity and Limitations

To improve the quality of the evaluation, the researcher uses the standardized ten-item SUS questionnaire and applies the established scoring procedure consistently to all valid responses. The eligibility criteria, data collection process, questionnaire language, and handling of incomplete responses are documented. The study also acknowledges that SUS measures perceived usability rather than directly measuring task completion time, error frequency, or technical performance. Therefore, the findings are interpreted within the scope of users' subjective assessments. If necessary, supplementary interviews or task-based observations may be used in future research to investigate specific usability problems and develop more targeted recommendations.

## 3. RESULTS AND DISCUSSION

### 3.1. Results of the Usability Evaluation

The usability evaluation of the mobile-based academic information system was designed to examine users' perceptions of the application's overall usability. The System Usability Scale (SUS) was employed as the primary evaluation instrument because it provides a standardized approach for measuring perceived usability through ten questionnaire items. The instrument evaluates users' perceptions of system complexity, ease of use, consistency, learnability, and confidence when interacting with the application. The resulting scores provide an overall indication of how users perceive the usability of the system in the context of academic activities.

For the purpose of demonstrating the analysis and presentation of results, the tables in this section use an illustrative dataset of 20 respondents. The numerical values are hypothetical and are not derived from an actual survey. In an empirical study, the values must be replaced with the results obtained from valid questionnaire responses. The analytical procedure, however, can be applied to actual data collected from students or other eligible users of the academic information system.

The evaluation process consists of reviewing questionnaire completeness, calculating individual SUS scores, determining the mean usability score, and interpreting the results against established SUS benchmarks. This approach provides a structured overview of perceived usability and supports the identification of areas that may require further investigation.

### 3.2. Respondent and Data Overview

The quality of the usability evaluation depends on the relevance of the participants' experience with the application and the completeness of the collected responses. Respondents should have sufficient experience using the mobile-based academic information system to evaluate its functions and interface. For example, students may interact with the application to check course schedules, access academic announcements, review examination results, and obtain information about academic registration.Before calculating SUS scores, the researcher should verify that each questionnaire contains valid responses to all ten items. This step is important because the SUS scoring formula requires a response for every item. Incomplete questionnaires should be handled according to predefined exclusion or data-handling criteria rather than being automatically assigned a score.

**Table 1.** Illustrative Overview of the Evaluation Dataset

| Evaluation component | Illustrative value |
|---|---|
| Target participants | 20 respondents |
| Completed questionnaires | 20 |
| Valid questionnaires | 20 |
| Number of SUS items | 10 |
| Response scale | 1–5 Likert scale |
| Individual SUS score range | 0–100 |
| Primary analysis | Descriptive statistics |

Table 1 presents the structure of the dataset used in the example. In this hypothetical scenario, all 20 submitted questionnaires are assumed to be complete and valid. Consequently, all responses are included in the scoring process. In an actual study, the number of invited participants, submitted questionnaires, and valid responses may differ. Reporting these numbers separately improves transparency and enables readers to understand the basis of the analysis.

### 3.3. Analysis of System Usability Scale Responses

The SUS questionnaire contains five positively worded items and five negatively worded items. The alternating wording requires the researcher to reverse the scoring direction for negatively worded statements. This procedure ensures that higher adjusted scores consistently represent more favorable perceptions of usability. For positively worded items (items 1, 3, 5, 7, and 9), the contribution score is calculated by subtracting 1 from the original response. For negatively worded items (items 2, 4, 6, 8, and 10), the contribution score is calculated by subtracting the original response from 5. The ten contribution scores are then added together and multiplied by 2.5 to obtain the final SUS score. The following table presents hypothetical mean responses for each item. These values are included to demonstrate how the questionnaire results can be summarized before the final SUS score is calculated.

**Table 2.** Illustrative Mean Responses to the Ten SUS Items

| Item | Evaluation aspect | Item wording direction | Illustrative mean |
|---|---|---|---|
| SUS 1 | Intention to use the system frequently | Positive | 4.0 |
| SUS 2 | Perceived unnecessary complexity | Negative | 2.4 |
| SUS 3 | Perceived ease of use | Positive | 4.1 |
| SUS 4 | Need for technical assistance | Negative | 2.2 |
| SUS 5 | Integration of system functions | Positive | 4.0 |

| | | | |
|---|---|---|---|
| SUS 6 | Perceived inconsistency | Negative | 2.5 |
| SUS 7 | Ease of learning | Positive | 3.7 |
| SUS 8 | Perceived difficulty of use | Negative | 2.3 |
| SUS 9 | Confidence when using the system | Positive | 4.0 |
| SUS 10 | Need to learn many things before use | Negative | 2.1 |

Table 2 demonstrates how the mean responses may be presented to identify broad patterns in users' perceptions. In the illustrative dataset, the positively worded items receive relatively favorable mean responses. The mean response for perceived ease of use (SUS 3), for example, is 4.1 out of 5, while the intention to use the system frequently (SUS 1) and confidence when using it (SUS 9) each have a mean of 4.0.

### 3.4. Calculation of the Overall SUS Score

The overall SUS score is calculated by adjusting the responses to all ten questionnaire items according to the established scoring procedure. For the illustrative mean responses in Table 2, the adjusted contribution for each positively worded item is its mean response minus 1. For each negatively worded item, the adjusted contribution is 5 minus its mean response.

**Table 3.** Illustrative SUS Score Calculation

| Item | Mean response | Scoring calculation | Adjusted contribution |
|---|---|---|---|
| SUS 1 | 4.0 | 4.0 − 1 | 3.0 |
| SUS 2 | 2.4 | 5 − 2.4 | 2.6 |
| SUS 3 | 4.1 | 4.1 − 1 | 3.1 |
| SUS 4 | 2.2 | 5 − 2.2 | 2.8 |
| SUS 5 | 4.0 | 4.0 − 1 | 3.0 |
| SUS 6 | 2.5 | 5 − 2.5 | 2.5 |
| SUS 7 | 3.7 | 3.7 − 1 | 2.7 |
| SUS 8 | 2.3 | 5 − 2.3 | 2.7 |
| SUS 9 | 4.0 | 4.0 − 1 | 3.0 |
| SUS 10 | 2.1 | 5 − 2.1 | 2.9 |
| **Total** | **—** | **Sum of contributions** | **28.3** |
| **Final SUS score** | **—** | **28.3 × 2.5** | **70.75** |

The total adjusted contribution in Table 3 is 28.3. Multiplying this value by 2.5 produces an illustrative SUS score of 70.75. Because the original table contains rounded mean responses, this calculation demonstrates the procedure rather than establishing a definitive score for a real group of respondents. In an actual evaluation, the preferred procedure is to calculate each respondent's SUS score from their ten original responses and then calculate the mean of those individual scores.

The overall SUS score provides a standardized summary of users' perceived usability. A score of 70.75 in this example would be above the commonly cited benchmark of approximately 68. Nevertheless, a score above this benchmark does not prove that every feature is easy to use or that the application is free from usability problems. It indicates only that the composite perceived-usability result is above the selected reference point.

### 3.5. Interpretation of the SUS Score

The interpretation of the SUS score requires an appropriate benchmark and a clear explanation of the selected interpretive framework. Bangor, Kortum, and Miller (2008) examined SUS data across numerous products and demonstrated the usefulness of the instrument for assessing perceived usability. Subsequent work also examined how numerical SUS scores relate to adjective ratings and acceptability judgments.

A score of approximately 68 is commonly used as a general reference for average SUS performance. Scores above this benchmark are often interpreted as above average, whereas scores below it indicate that perceived usability may warrant closer examination. However, this benchmark is not a universal pass-or-fail threshold for every system. The intended users, application context, evaluation conditions, and comparison dataset should be considered when drawing conclusions.

**Table 4.** Example of SUS Score Interpretation

| Illustrative SUS score | General interpretation | Recommended consideration |
|---|---|---|

| | | |
|---|---|---|
| Below 50 | Low perceived usability | Investigate major usability barriers |
| 50 to below 68 | Below the commonly cited benchmark | Identify and prioritize potential improvements |
| Approximately 68 | Around the general reference benchmark | Examine specific usability concerns |
| Above 68 to below 80 | Above the general reference benchmark | Maintain strengths and investigate remaining problems |
| 80 or higher | Relatively strong perceived usability | Validate performance and seek further improvements |

Table 4 presents a simplified interpretive framework for discussing SUS results. These categories are intended to support descriptive reporting rather than to establish a definitive classification system for all applications. Researchers may choose more specific adjective ratings, grade scales, or acceptability ranges when the selected framework and its limitations are clearly explained.

Using this simplified framework, the illustrative score of 70.75 falls above the commonly cited benchmark of 68. It would therefore be described as an above-benchmark result. A more specific adjective rating should be assigned only when the researcher explicitly adopts a validated or established mapping and applies it consistently.

### 3.6. Discussion of Usability Findings

The overall SUS score provides an initial indication of whether the mobile-based academic information system is perceived as usable by its intended users. In the illustrative scenario, the score of 70.75 is above the commonly cited reference benchmark of 68. This pattern would suggest that users generally perceive the system as reasonably usable, although additional evidence would be needed to determine which features perform well and which require improvement. This interpretation is consistent with the purpose of the SUS instrument as described by Brooke (1996), who introduced SUS as a practical method for obtaining a composite measure of perceived usability. Its standardized format enables researchers to summarize subjective evaluations without requiring a lengthy questionnaire. Bangor et al. (2008) further demonstrated the usefulness of SUS across a broad range of products and evaluation contexts. Nevertheless, these methodological strengths do not eliminate the need to interpret results within the particular context of the application being evaluated.

In higher education, usability has practical implications because academic information systems support activities that students may need to perform repeatedly. If the interface is understandable and the navigation structure is predictable, users may be able to locate relevant information with less uncertainty. Conversely, confusing menus, unclear labels, inconsistent layouts, or poorly organized information may make routine academic tasks unnecessarily difficult. The results should therefore be discussed in relation to the actual functions available in the application. For example, if students report difficulty locating examination results or course schedules, developers could investigate whether these functions are clearly labeled and accessible from the main navigation menu. If users indicate that they need technical assistance, the institution could examine onboarding instructions, interface terminology, and the visibility of important controls. These are potential explanations and recommendations, not conclusions that can be established from an overall SUS score alone.

The distinction between perceived usability and observed usability is particularly important. SUS measures users' subjective assessments of the system, whereas task-based usability testing can examine whether users complete particular activities successfully, how long they take, and what errors occur. An application could receive a relatively favorable SUS score while still containing a problematic feature that affects a specific group of students. Combining SUS with task-based observations or short follow-up interviews could therefore provide more actionable evidence for system improvement.

## 4. CONCLUSION

This study focuses on evaluating the usability of a mobile-based academic information system using the System Usability Scale (SUS). Usability is an important factor in determining whether an academic application can effectively support students and other users in accessing academic information and completing routine academic activities. By applying a standardized usability questionnaire, this study provides a systematic approach to assessing users' perceptions of the application's ease of use, complexity, consistency, and learnability. The SUS method offers a practical and structured means of measuring perceived usability through ten questionnaire items and a standardized scoring procedure. The resulting score can be used to describe the overall usability of the application and compare its performance with relevant benchmarks. Based on the illustrative calculation presented in this paper, the hypothetical SUS score of 70.75 is above the commonly cited reference benchmark of 68. This example demonstrates how SUS results can be interpreted to provide an

initial assessment of perceived usability. However, because the numerical values presented in the results section are illustrative rather than empirical, they cannot be used to establish a definitive conclusion about the actual academic information system. The final conclusion must be based on valid responses collected from the study participants.

The findings of an actual evaluation can provide useful information for application developers and higher education administrators when identifying opportunities to improve the user interface, navigation structure, clarity of information, and accessibility of academic services. Nevertheless, SUS scores should not be interpreted as direct measurements of task completion, technical performance, or the absence of usability problems. Additional methods, such as usability testing, interviews, and task-based observations, may be employed to identify specific difficulties that require further attention. Future research is recommended to involve a broader range of users, examine differences in usability perceptions across user groups, and evaluate the application after interface improvements have been implemented. Longitudinal studies may also help determine whether users' perceptions change as they become more familiar with the system. In conclusion, the SUS provides a valuable foundation for usability evaluation, while combining standardized measurement with complementary assessment methods can support continuous improvement and contribute to more accessible, efficient, and user-centered academic information services in higher education.

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