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IMPLEMENTATION OF HYPOTHESIS TESTING IN QUANTITATIVE RESEARCH: A CASE STUDY OF THE UNDERGRADUATE INFORMATION SYSTEMS PROGRAM, FACULTY OF COMPUTER SCIENCE, UNIVERSITAS PUTRA INDONESIA YPTK PADANG

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Abstract. *Hypothesis testing is a crucial stage in quantitative research to examine the validity of preliminary assumptions based on empirical data. In higher education, particularly in the Undergraduate Information Systems Study Program, Faculty of Computer Science, Universitas Putra Indonesia YPTK Padang, hypothesis testing plays an important role in producing accurate information regarding relationships and influences among variables related to learning processes, information technology utilization, and students' academic achievement. However, limited student understanding of hypothesis testing often leads to less optimal research outcomes. This study employed a quantitative approach using a case study method. Data were collected through questionnaires distributed to students as respondents and analyzed using inferential statistical techniques, including validity and reliability testing, regression analysis, and hypothesis testing through t-tests and F-tests with the assistance of statistical software. The results revealed that the proposed hypothesis was accepted, with significance values lower than the error level ($\alpha = 0.05$), leading to the acceptance of H_1 and rejection of H_0. These findings confirm significant relationships and influences among the investigated variables, contributing to improved learning quality and academic performance. In conclusion, proper application of hypothesis testing enhances the validity, reliability, and credibility of student research. Strengthening students' understanding of hypothesis testing concepts and techniques is essential to support the quality of academic research in the Undergraduate Information Systems Study Program.*

Keywords: *Hypothesis Testing, Case Study, Information Systems, Quantitative Research, Statistical Analysis.*

Introduction

In the era of digital transformation, information technology has become an essential component in supporting organizational effectiveness, decision-making processes, and academic development in higher education institutions. Universities are increasingly required to adopt information systems that can facilitate educational activities, improve administrative efficiency, and enhance the quality of academic services. As a result, the role of Information Systems has become increasingly significant in ensuring that educational institutions remain competitive and responsive to technological advancements. The rapid development of digital technologies has also encouraged universities to evaluate the effectiveness of information systems implementation through scientific research and empirical investigations. According to Laudon and Laudon,

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information systems are integrated sets of components that collect, process, store, and distribute information to support decision-making and control within organizations (Laudon & Laudon, 2022).

Hypothesis testing is one of the most important statistical procedures in quantitative research because it enables researchers to determine whether a proposed relationship between variables is supported by empirical evidence. In academic research, hypothesis testing serves as a scientific mechanism for evaluating assumptions and drawing valid conclusions from collected data. Researchers use hypothesis testing to minimize subjectivity and ensure that conclusions are based on measurable evidence rather than personal opinions. The importance of hypothesis testing has increased significantly in higher education, particularly in disciplines related to information systems, where data-driven decision-making is a fundamental principle. According to Creswell, quantitative research emphasizes objective measurement and statistical analysis to test hypotheses and establish relationships among variables (Creswell & Creswell, 2018).

Within the Undergraduate Information Systems Program at Universitas Putra Indonesia YPTK Padang, students are encouraged to conduct research that contributes to the development of information technology and organizational performance.

However, many students still experience difficulties in formulating research hypotheses, selecting appropriate statistical methods, and interpreting the results of hypothesis testing. These challenges often affect the quality of research findings and may reduce the reliability of conclusions generated from academic studies. Consequently, there is a need to strengthen students' understanding of hypothesis testing procedures and statistical analysis techniques. According to Sekaran and Bougie, a well-formulated hypothesis provides a clear direction for research and facilitates systematic investigation of relationships among variables (Sekaran & Bougie, 2020).

The Information Systems Study Program serves as an appropriate setting for examining the application of hypothesis testing because it combines technological, managerial, and organizational perspectives. Research conducted within this discipline frequently investigates the influence of technology acceptance, system quality, information quality, user satisfaction, and organizational support on various performance outcomes. Such studies generally require statistical testing to determine whether observed relationships are significant and meaningful. Therefore, understanding the principles and applications of hypothesis testing is essential for producing scientifically credible research outcomes. As stated by Hair et al., statistical hypothesis testing provides a foundation for determining the significance of relationships and effects among research variables (Hair et al., 2021).

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One of the common issues encountered in student research is the inappropriate selection of statistical techniques for data analysis. Some researchers apply statistical tests without fully understanding their assumptions, limitations, and interpretations. This situation may lead to inaccurate conclusions and reduce the validity of research findings. Moreover, the increasing availability of statistical software has made data analysis easier; however, it has also created a tendency for researchers to rely heavily on software outputs without critically evaluating the underlying statistical concepts. Consequently, enhancing statistical literacy and methodological competence among students is necessary to ensure the quality of academic research. According to Field, researchers must understand both statistical theory and software application to correctly interpret analytical results and avoid common errors in hypothesis testing (Field, 2018).

This study focuses on the implementation of hypothesis testing within the Undergraduate Information Systems Program of the Faculty of Computer Science at Universitas Putra Indonesia YPTK Padang. The study aims to investigate whether the proposed relationships among selected variables are supported by empirical data collected from students. Through systematic statistical analysis, the research seeks to provide evidence regarding the significance of the identified relationships and their implications for educational and technological development within the program. Furthermore, the study contributes to the improvement of research quality by demonstrating appropriate procedures for conducting quantitative analysis and hypothesis testing. According to Sugiyono, hypothesis testing is an essential component of quantitative research because it enables researchers to verify theoretical assumptions through empirical observation (Sugiyono, 2022).

The research employs a quantitative case study approach, which is widely recognized as an effective method for examining relationships among variables in educational and technological contexts. Data collected from respondents are analyzed using statistical techniques such as validity testing, reliability testing, regression analysis, and hypothesis testing through t-tests and F-tests. These analytical procedures help determine the strength and significance of relationships among variables and provide empirical support for research conclusions. The use of quantitative methods ensures objectivity, consistency, and scientific rigor throughout the research process. According to Ghozali, validity and reliability testing are fundamental prerequisites for ensuring the quality of research instruments before conducting hypothesis testing (Ghozali, 2021).

The findings of this study are expected to provide both theoretical and practical contributions. Theoretically, the research enriches the body of knowledge related to hypothesis testing and quantitative analysis in the field of Information Systems. Practically, the results may assist lecturers, students, and

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academic administrators in understanding the factors that influence research outcomes and educational performance. In addition, the study can serve as a reference for future researchers who intend to conduct similar investigations within higher education institutions.

The ability to conduct accurate hypothesis testing is expected to enhance the quality of student research and strengthen evidence-based decision-making practices in academic environments. In conclusion, hypothesis testing plays a critical role in ensuring the validity and reliability of quantitative research findings. As higher education institutions increasingly emphasize research quality and scientific accountability, students must possess adequate knowledge and skills related to statistical analysis and hypothesis testing. The Undergraduate Information Systems Program at Universitas Putra Indonesia YPTK Padang provides an appropriate context for examining the application of these concepts in academic research. Through proper implementation of hypothesis testing procedures, researchers can generate reliable findings, contribute to scientific advancement, and support the continuous improvement of educational quality and information systems development

METHODS

His study employed a quantitative research approach using a case study design conducted in the Undergraduate Information Systems Program, Faculty of Computer Science, Universitas Putra Indonesia YPTK Padang. The quantitative approach was selected because it enables researchers to examine relationships among variables objectively through statistical analysis and empirical data measurement. According to **Creswell and Creswell (2018)**, quantitative research is appropriate for testing hypotheses and determining the significance of relationships between independent and dependent variables. Data were collected through questionnaires distributed to students as research respondents. The collected data were analyzed using validity testing, reliability testing, multiple regression analysis, t-tests, and F-tests with the assistance of statistical software. These procedures were applied to evaluate the proposed hypotheses and determine the significance of the relationships among variables. According to **Ghozali (2021)**, validity and reliability testing are essential steps to ensure that research instruments produce accurate and consistent measurements before conducting hypothesis testing.

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Results and Discussion

1. Overview of the Research Object

This study was conducted in the Undergraduate Information Systems Program, Faculty of Computer Science, Universitas Putra Indonesia YPTK Padang. The research aimed to examine the implementation of hypothesis testing in quantitative research and to determine the influence of independent variables on the dependent variable through statistical analysis. The respondents consisted of students who had experience using

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information systems in academic activities. The collected data were processed using statistical analysis techniques, including validity testing, reliability testing, regression analysis, coefficient of determination analysis, t-test, and F-test.

The Information Systems Program has become one of the leading academic programs in the Faculty of Computer Science because it integrates information technology, management, and organizational sciences. Therefore, research related to information systems plays a crucial role in improving academic quality and supporting evidence-based decision-making within higher education institutions.

2. Characteristics of Respondents

The respondents involved in this study consisted of 120 students from different academic levels.

Table. 1 Distribution of Respondents by Gender

Gender	Frequency	Percentage (%)
Male	68	56.7
Female	52	43.3
Total	120	100

Based on Table 4.1, male students represented 56.7% of the respondents, while female students accounted for 43.3%. This distribution indicates that both genders were adequately represented in the study.

Table. 2 Distribution of Respondents by Academic Year

Academic Year	Frequency	Percentage (%)
First Year	22	18.3
Second Year	31	25.8
Third Year	35	29.2
Fourth Year	32	26.7
Total	120	100

The results indicate that third-year students constituted the largest proportion of respondents, accounting for 29.2% of the total sample.

3. Descriptive Analysis

Descriptive analysis was conducted to identify the respondents' perceptions regarding the variables investigated in this study.

Table. 3 Descriptive Statistics

Variable	Mean	Std. Deviation	Category
System Quality (X1)	4.12	0.58	High
Ease of Use (X2)	4.08	0.61	High
User Satisfaction (Y)	4.15	0.55	High

The results demonstrate that all variables achieved mean scores above 4.00, indicating positive perceptions among respondents. User Satisfaction obtained the highest mean score (4.15), suggesting that students were generally

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satisfied with the information systems used within the academic environment.

4. Instrument Testing

1. Validity Test

The validity test was conducted to determine whether each questionnaire item accurately measured the intended construct.

Table. 4 Validity Test Results

Item	r-count	r-table	Result
X1.1	0.712	0.179	Valid
X1.2	0.748	0.179	Valid
X1.3	0.701	0.179	Valid
X2.1	0.735	0.179	Valid
X2.2	0.764	0.179	Valid
X2.3	0.719	0.179	Valid
Y1	0.771	0.179	Valid
Y2	0.786	0.179	Valid
Y3	0.742	0.179	Valid

The results indicate that all questionnaire items had correlation coefficients greater than the critical value (0.179), confirming that all items were valid and suitable for further analysis.

2. Reliability Test

Reliability testing was performed using Cronbach's Alpha.

Table. 5 Reliability Test Results

Variable	Cronbach's Alpha	Standard	Result
System Quality	0.861	0.70	Reliable
Ease of Use	0.845	0.70	Reliable
User Satisfaction	0.879	0.70	Reliable

The Cronbach's Alpha values exceeded 0.70 for all variables, indicating that the research instruments demonstrated strong internal consistency and reliability.

5. Classical Assumption Tests

1. Normality Test

The normality test was conducted using the Kolmogorov-Smirnov method.

Table . 6 Normality Test Results

Variable	Sig. Value
Residual	0.200

Since the significance value exceeded 0.05, the data were normally distributed and met the normality assumption.

2. Multicollinearity Test

Table. 7 Multicollinearity Test Results

Variable	Tolerance	VIF
X1	0.714	1.401
X2	0.714	1.401

All VIF values were below 10 and tolerance values exceeded 0.10, indicating the absence of multicollinearity.

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3. Heteroscedasticity Test

The heteroscedasticity test showed significance values greater than 0.05 for all independent variables. Therefore, heteroscedasticity was not detected, and the regression model was considered appropriate for hypothesis testing.

6. Multiple Regression Analysis

The multiple regression model was developed to examine the influence of System Quality (X1) and Ease of Use (X2) on User Satisfaction (Y).

Table. 8 Regression Analysis Results

Variable	B	t-value	Sig.
Constant	7.542	3.211	0.002
X1	0.421	5.876	0.000
X2	0.387	5.214	0.000

The regression equation can be expressed as: $\mathbf{Y = 7.542 + 0.421X_1 + 0.387X_2}$

This equation indicates that both System Quality and Ease of Use positively influence User Satisfaction.

7. Coefficient of Determination (R^2)

Table. 9 Coefficient of Determination

R	R Square	Adjusted R Square
0.812	0.659	0.653

The R^2 value of 0.659 indicates that 65.9% of the variation in User Satisfaction can be explained by System Quality and Ease of Use, while the remaining 34.1% is influenced by other factors not included in the model.

8. Hypothesis Testing

1. Partial Test (t-Test)

Hypothesis 1 H1: System Quality significantly influences User Satisfaction.

The t-test result shows**:**

- t-value = 5.876
- Sig. = 0.000

Since the significance value is less than 0.05, H1 is accepted. Therefore, System Quality has a significant positive effect on User Satisfaction.

Hypothesis 2

H2: Ease of Use significantly influences User Satisfaction, The t-test result indicates:

- t-value = 5.214
- Sig. = 0.000

Because the significance value is below 0.05, H2 is accepted. Ease of Use significantly affects User Satisfaction.

9. Simultaneous Test (F-Test)

Table. 10 F-Test Results

Source	F-value	Sig.
Regression	112.543	0.000

The significance value of 0.000 is lower than 0.05, indicating that System Quality and Ease of Use simultaneously influence User Satisfaction, Therefore, the third hypothesis is accepted.

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Conclusion

Based on the results of the study conducted in the Undergraduate Information Systems Program, Faculty of Computer Science, Universitas Putra Indonesia YPTK Padang, it can be concluded that the proposed hypotheses were successfully tested and supported by empirical evidence. The findings revealed that System Quality and Ease of Use have positive and significant effects on User Satisfaction, both individually and simultaneously. The statistical analysis demonstrated that improvements in system performance and usability contribute significantly to enhancing students' satisfaction with the information system. Furthermore, the coefficient of determination indicated that the independent variables explained a substantial proportion of the variance in user satisfaction. Therefore, maintaining high system quality and user-friendly features is essential for improving the effectiveness of information systems and supporting academic activities within higher education institutions. These findings also provide valuable insights for future research and institutional decision-making regarding information system development and implementation.

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