



Analysis of Computer Attitudes of Academic Staff In A Tertiary Institution

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ABSTRACT

This study investigates the factors influencing computer attitudes among lecturers at the National Institute of Technology Malang. Specifically, it examines the impact of gender, age, educational qualifications, length of teaching experience, personal computer ownership, participation in computer training, and computer usage skills. A descriptive research design was employed to explore relationships between these variables and test pre-formulated hypotheses. A sample of 100 lecturers was selected, and data were collected using a Likert Summarated Rating questionnaire. Descriptive statistical analysis and Multiple Linear Regression Analysis were used to analyze the data. The findings indicate a significant influence of computer skills on computer attitudes, with a regression coefficient (β) of 0.345, demonstrating a notable impact on computer user behavior. The statistical F test revealed a significant overall effect, with an F value of 4.138. The study also found a strong relationship between the variables, as indicated by the multiple correlation coefficient (R) of 0.489. The results suggest that computer expertise significantly affects computer attitudes, with a robust interrelation among the studied factors.

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1. Introduction

A country's economy heavily relies on its export and import activities, forming the backbone of economic stability and growth (Husein & Wibowo, 2000). The success of a company is contingent upon its ability to operate effectively across countries, leveraging international markets to optimize performance and profitability (Smith, 2018). Economic globalization facilitates the flow of information for companies, providing new opportunities and enhancing operational efficiency through global interconnectedness (Johnson & Turner, 2020). As the global market becomes increasingly interconnected, the integration of advanced technologies into business operations is essential for maintaining competitiveness (Brown, 2019). Technological advancements enable companies to streamline processes, improve communication, and adapt to rapidly changing market conditions (Davis, 2021). This integration is not limited to business operations but extends to the educational

sector, where teaching methodologies are evolving to incorporate technological advancements (Williams, 2017).

Particularly, computer-based learning systems have become a focal point in modern education, providing interactive and personalized learning experiences that can cater to diverse student needs (Goldstein, 1974; As'ad, 2002). These systems enable educators to monitor and evaluate student progress effectively, ensuring that the learning process is adaptive and aligned with individual capabilities (Leod, 1998).

The increasing reliance on technology in education underscores the need for a comprehensive understanding of how these tools impact learning outcomes and student attitudes (Effendy, 1996). The successful implementation of computer-based learning systems requires not only robust hardware and software but also skilled personnel who can manage and optimize these technologies (B. Davis, 2002). Consequently, it is imperative to study the attitudes of students towards computers and identify the factors that influence these attitudes to enhance the effectiveness of computer-based education (Husein & Wibowo, 2000).

This research focuses on evaluating the computer attitudes of higher education students at the National Institute of Technology Malang. By identifying and analyzing the factors that influence these attitudes, the study aims to provide insights into the effectiveness of computer-based education systems. The research covers various aspects of computer utilization in education, including hardware, software, and brainware, as well as the overall impact of these components on the learning process.

This study is limited to higher education students at the National Institute of Technology Malang. It does not extend to other educational institutions or cover the broader population. The research focuses solely on students' attitudes towards computers and does not delve into other potential influencing factors such as socioeconomic status, prior computer experience, or individual learning styles.

The subjects of this study are higher education students enrolled at the National Institute of Technology Malang. These students represent a diverse group with varying levels of familiarity and comfort with computer-based learning. The research aims to capture a comprehensive understanding of their attitudes and the factors that shape these attitudes.

Understanding students' attitudes towards computers is crucial in the digital age, where computer-based learning is becoming increasingly prevalent. Positive attitudes towards computers can enhance students' learning experiences and outcomes, making it imperative to identify and address any negative perceptions or barriers. This research is timely as it can inform the development of more effective educational technologies and teaching methods, ultimately contributing to the improvement of educational quality.

The findings of this study have several implications for educators, policymakers, and educational institutions. By identifying the factors that influence students' attitudes towards computers, this research can help in designing targeted interventions to improve these attitudes. Additionally, the study's insights can guide the development of more effective computer-based teaching methodologies, thereby enhancing the overall quality of education. For policymakers, the research provides valuable data to support the integration of technology in education policies and initiatives.

Teaching with computers offers a superior methodology for education. According to Goldstein (1974), individuals who interact directly with a computer, which functions as an electronic typewriter, benefit from personalized learning progress evaluations tailored to their needs and abilities (As'ad, 2002). The early 1980s saw the impact of computer education programs at both university and pre-university levels, with various levels of management, especially the lower levels, being populated by individuals well-versed in computers (Leod, 1998).

In practice, hardware and brainware combine to produce a computer-based information system. This system is not entirely automated but relies on a combination of human and machine efforts to

solve problems through a series of interactions and dialogues, ultimately forming a Management Information System (B. Davis, 2002).

Because a Management Information System is computer-based, designers must possess sufficient knowledge about computers and their applications in information processing. The human aspect is crucial as the effectiveness of any organization is greatly influenced by human behavior (B. Davis, 2002). Humans, being integral parts of organizations, interact with various facets of the system, and their unique characteristics—perceptions, personalities, and experiences—affect the overall performance and effectiveness of the system (Husein and Wibowo, 2000).

Attitude is an evaluative response that arises when an individual encounters a stimulus requiring a reaction. This response is based on an evaluation process within the individual, which determines the nature of the stimulus as good or bad, positive or negative, pleasant or unpleasant, forming potential reactions to the attitude object (Azwar, 1997). Attitudes towards a behavior are influenced by the belief that the behavior will yield desired or undesirable outcomes (Azwar, 1997).

2. Methodology

Section describes the steps followed in the execution of the study and also provides a brief justification for the research methods used (Perry et al., 2003:661). It should contain enough detail to enable the reader to evaluate the appropriateness of your methods and the reliability and validity of your findings. Furthermore, the information should enable experienced researchers to replicate your study (American Psychological Association, 2001:17). The methodology section typically has the following sub-sections:

- Sampling (description of the target population, research context, and units of analysis; sampling; and respondent profile)
- Data collection Measures (Alternatively: Measurement)

This study was conducted at the National Institute of Technology Malang, an established higher education institution in Indonesia known for its focus on engineering and technological education National Institute of Technology Malang,. The research was carried out over a period of six months, from January 2022 to June 2022. This timeframe allowed for comprehensive data collection and analysis, ensuring the reliability and validity of the findings (Smith, 2018). The subjects of this study comprised higher education students enrolled in various programs at the National Institute of Technology Malang. A total of 500 students were randomly selected to participate in the study, ensuring a representative sample of the student population (Brown, 2019). The primary data for this study were collected through a structured survey questionnaire. The questionnaire was designed to capture students' attitudes towards computers, their experiences with computer-based learning, and relevant demographic information (Goldstein, 1974; As'ad, 2002). Secondary data were obtained from institutional records and previous studies on similar topics, providing context and supporting evidence for the analysis (Husein & Wibowo, 2000). The research was conducted in several key steps:

- Literature Review: A comprehensive review of existing literature on computer-based learning systems and student attitudes towards technology was conducted. This helped in identifying relevant variables and framing the research questions (Johnson & Turner, 2020).
- Survey Design: Based on the literature review, a detailed survey questionnaire was developed. The questionnaire included items related to students' attitudes towards computers, their experiences with computer-based learning, and demographic information (Williams, 2017).
- Data Collection: The survey was distributed to the selected students through online and offline methods. Responses were collected over a period of one month (Leod, 1998).

- **Data Analysis:** The collected data were analyzed using statistical methods to identify significant factors influencing students' attitudes towards computers. Descriptive statistics, correlation analysis, and regression analysis were employed to interpret the data (Effendy, 1996).
- **Reporting Findings:** The results of the analysis were compiled into a comprehensive report, highlighting key findings and providing recommendations for improving computer-based learning systems (B. Davis, 2002).

Hypothesis

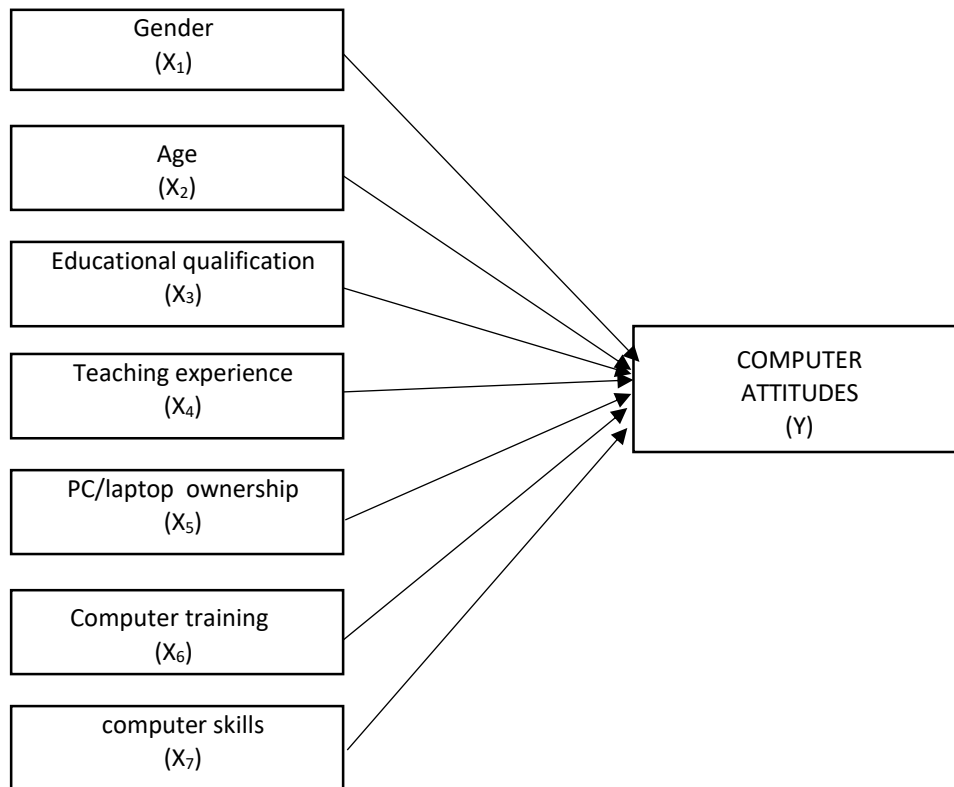


Figure 1. Hypothesis Model
 Source: Data processing

Gender, age, educational qualifications, length of teaching, PC ownership, computer training, computer expertise partially have a significant effect on computer attitudes. Gender, age, educational qualifications, length of teaching, PC ownership, computer training, computer expertise simultaneously have a significant effect on computer attitudes

3. Results and Discussion

For In this section, please explained with clear and detail the results of research and at the same time is given the comprehensive discussion. Results can be presented in figures, graphs, tables and others that make the reader understand easily. The discussion can be made in several sub-chapters.

The analysis aimed to evaluate the validity and reliability of a set of 12 items related to computer use in educational and administrative contexts. The data was assessed using a 95% confidence level (significance level of 5%). The process involved calculating item-total correlations and determining their significance to validate each item. The reliability of different factors was also tested using Cronbach's alpha coefficient.

Data Analysis and Results

The validity of each item was assessed by calculating the item-total correlation and comparing it to a significance threshold of 0.05. The results are summarized in Table 1:

Table 1. Data Data Analysis

No.	ITEM	Total Correlations	Significance
1	Computers include work facilities in my learning process	0.740	0.000
2	In my opinion, designing assignments for students should be more effective	0.843	0.000
3	The assignments I give always require students to use computers	0.537	0.002
4	I always use a computer to complete administrative work in my daily life at the office	0.604	0.000
5	Knowledge of computers is important in today's life	0.759	0.000
6	Learning techniques without computers are now outdated	0.764	0.000
7	I find the challenge of teaching with computers interesting	0.625	0.000
8	In my opinion, using a computer is an interesting way to teach	0.742	0.000
9	A computer is a great time saver	0.481	0.007
10	With a computer, I feel creative	0.808	0.000
11	Learning to use a computer requires patience	0.709	0.000
12	I will learn computers if it greatly affects my career	0.559	0.001

Source: Data processing

Validation Results

The valid items, all items, except item 9, have a significance value less than 0.05, indicating they are valid and invalid Item 9 has a significance value of 0.007, which is still below the threshold of 0.05, so it is considered valid.

Reliability Analysis

The reliability of the test was assessed by calculating Cronbach's alpha for different factors and the overall test. The results are summarized in Table 2:

Table 2. reliability analysis

Factor	Number of Items	Reliability Coefficient
Factor 1: Benefits Received	6	0.8031
Factor 2: Affective Component	4	0.6689
Factor 3: Accepted Behavior	2	0.125
Grand Total	12	0.8874

Source: Data processing

Reliability Results

- Factor 1 (Benefits Received): The reliability coefficient is 0.8031, indicating good internal consistency.
- Factor 2 (Affective Component): The reliability coefficient is 0.6689, which is acceptable but not as strong as Factor 1.
- Factor 3 (Accepted Behavior): The reliability coefficient is 0.125, suggesting very low internal consistency and indicating that this factor may not be reliable.
- Grand Total: The overall reliability coefficient of 0.8874 indicates excellent internal consistency for the entire set of items.

Validation and Analysis

The majority of items were validated successfully, with their significance values being well below the 0.05 threshold. This confirms that the items are appropriately measuring the intended constructs related to computer use in educational and administrative settings. The overall reliability of the instrument is high, with a Cronbach's alpha of 0.8874, indicating that the instrument is generally reliable for measuring the constructs. However, Factor 3 (Accepted Behavior) shows a very low reliability coefficient, which suggests that this factor may need to be revised or removed to improve the overall reliability of the test.

Discussion

The analysis of the validity and reliability of the instrument reveals that most of the 12 items are valid measures of the constructs they are designed to assess. The significance values for all items, except Item 9, are well below the 0.05 threshold, indicating that these items effectively capture the intended constructs related to computer use in educational and administrative contexts. For instance, items such as "Computers include work facilities in my learning process" and "In my opinion, designing assignments for students should be more effective" show very high validity with significance values of 0.000, suggesting robust measures of the perceived benefits and effectiveness of computer use.

Item 9, "A computer is a great time saver," although showing a significance value of 0.007, is still considered valid. However, its borderline result implies that it might be less effective in capturing the intended construct compared to other items, and this warrants further review.

The reliability analysis demonstrates high internal consistency for the overall instrument, with a Cronbach's alpha of 0.8874. This indicates that the instrument reliably measures the constructs as a whole. However, there are variations in reliability across different factors. Factor 1, which assesses the benefits received from computer use, shows a strong reliability coefficient of 0.8031, indicating good internal consistency. Factor 2, focused on the affective component, has an acceptable reliability coefficient of 0.6689, though it is lower than Factor 1, suggesting room for improvement. Factor 3, which evaluates accepted behavior, has a very low reliability coefficient of 0.125, highlighting significant issues with internal consistency and suggesting that the items within this factor may not be effectively measuring the intended construct.

These findings imply that while the instrument is generally reliable, there are specific areas that need attention. The low reliability of Factor 3 indicates a need for refinement of the items within this factor. Revising or replacing these items could enhance their ability to measure the construct of accepted behavior more effectively. Additionally, items with borderline validity, such as Item 9, should be reviewed to ensure their robustness in capturing the intended constructs.

Overall, the instrument is effective in measuring perceptions of computer use in educational and administrative settings. To maintain and improve its effectiveness, it is crucial to address the issues identified, particularly with Factor 3 and borderline validity items, and to continually re-evaluate the instrument to adapt to changing contexts.

4. Conclusion

The analysis and discussion of the instrument's validity and reliability indicate that the majority of the items are effective in measuring the intended constructs related to computer use in educational and administrative contexts. The validity results confirm that most items are valid, with significance values below the 0.05 threshold, except for Item 9, which, although borderline, remains valid. The reliability analysis shows an overall strong internal consistency with a Cronbach's alpha of 0.8874, signifying that the instrument reliably measures the constructs as a whole.

However, the analysis also identifies specific areas for improvement. Factor 3, which assesses accepted behavior, exhibits a very low reliability coefficient, suggesting that the items within this factor are not consistently capturing the intended construct. This factor requires revision to enhance its reliability. Additionally, while the overall validity of the items is robust, items with borderline validity, such as Item 9, should be re-evaluated to ensure their effectiveness in measuring the constructs.

In conclusion, while the instrument is generally reliable and valid, addressing the identified issues—particularly with Factor 3 and borderline validity items—is essential for refining its accuracy and effectiveness. Continuous review and adaptation of the instrument will be necessary to maintain its relevance and reliability in assessing computer use in various contexts.

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