

EXAMINING THE FACTORS THAT AFFECT INTERNSHIP STUDENT TEACHERS' USE OF TECHNOLOGY: A STUDY OF UNIVERSITAS NEGERI MAKASSAR

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Abstract

This study investigates the factors influencing internship student teachers' use of technology at Universitas Negeri Makassar. The research aims to identify key determinants that shape their preferences and attitudes toward integrating technology into teaching practices. Data were collected and analyzed using Confirmatory Factor Analysis (CFA), revealing several critical factors with varying levels of influence based on their loading factors. The strongest predictors of technology use included Student Interest and Motivation (0.81), Perceived Value (0.79), and Self-Efficacy (0.76). These highlight the importance of student engagement, personal confidence, and the perceived utility of technology in driving adoption. Other significant factors were Resources and Infrastructure (0.72), Alignment with Curriculum Goals (0.64), and Administrative Support (0.63), underscoring the role of institutional and logistical support. Moderate contributions were noted from Societal and Cultural Influences (0.61), Government Policies and Mandates (0.57), and Professional Development Opportunities (0.54). These indicate external and professional contexts shaping technology integration. Meanwhile, Innovative Teaching Practices (0.53) and Professional Development (0.43) demonstrated lower impacts, suggesting room for improvement in training initiatives.

Keywords: Technology, Student Teacher, Factors

A. Background

The integration of technology in the mathematics classroom has become an increasingly important aspect of teaching and learning in the digital era. This is particularly relevant for internship student teachers majoring in mathematics education, as they must not only develop a strong understanding of mathematical concepts, but also the ability to effectively incorporate technology into their teaching practices.

The application of technology in mathematics education has been found to have a significant impact on student learning and achievement. Studies have shown that the use of technology-based tools can enhance students' interest and engagement in the subject, as well as their overall understanding of mathematical concepts.

(Othman & Maat, 2020) (Serin, 2017) Furthermore, the integration of technology in the classroom can also lead to a positive growth in teaching, as it allows educators to tailor their instruction to the diverse needs and abilities of their students. (Othman & Maat, 2020)

However, the successful integration of technology in the classroom is not without its challenges. Factors such as the lack of resources, teacher competence, and time constraints can all hinder the effective use of technology in the mathematics classroom.

In the context of Universitas Negeri Makassar, a recent study found that several factors influence the integration of ICT in education, including the vision and personal perception of teachers, their competence, and the availability of electronic-based learning resources. (Sokku & Anwar, 2019)

Another study on the use of technology in mathematics education has highlighted the importance of preparing students to become successful global citizens in the 21st century. Educators must be wise in selecting and using technology-based teaching aids that have the potential to enhance students' interest and achievement in the subject (Othman & Maat, 2020).

Consequently, it is crucial to understand the factors that influence the preference of internship student teachers in applying technology in the mathematics classroom. By addressing these factors, teacher education programs can better support the development of pre-service teachers who are equipped to effectively integrate technology into their teaching practices (Serin, 2017) (Othman & Maat, 2020) (Sokku & Anwar, 2019). This study aims to investigate the factors that influence the preference of internship student teachers at Universitas Negeri Makassar in applying technology in the mathematics classroom.

Several factors influence teachers' decisions to integrate technology into their classrooms which are described as follows:

1. Teacher Beliefs and Attitudes

This dimension consist of Self-Efficacy, i.e. teachers who believe in their ability to use technology effectively are more likely to incorporate it into their teaching practices (Bandura, 1997) and perceived value: teachers who believe

technology can enhance student learning and engagement are more likely to use it (Mishra & Koeler, 2006).

2. Technological Knowledge and Skills

This dimension is related to training and professional development: access to high-quality training and professional development opportunities can significantly impact teachers' technology integration.

3. School and Institutional Support

This kind of support consists of administrative support, i.e., encouragement and support from school administrators can foster a positive climate for technology integration (Sandholtz, et al, 1997) and also resources and infrastructure: adequate access to technology resources, such as computers, internet connectivity, and software, is crucial for effective technology integration.

4. Student Characteristics and Needs

A factor that makes teachers more likely to use technology is student interest and motivation where teachers believe technology can capture students' attention and motivate them to learn (Prensky, 2001)

5. Curriculum and Pedagogical Considerations

Teacher preference in using technology may be caused by the alignment with curriculum goals that is teachers more likely to use technology if it aligns with their curriculum goals and teaching objectives. In addition innovative teaching practices may have a role in affecting teacher to use technology which can support innovative teaching practices, such as project-based learning, flipped classrooms, and personalized learning.

6. External Factors

Several external factors for instance government policies and mandates, can influence the adoption and use of technology in schools. Moreover, societal and cultural factors regarding technology use can also impact teachers' decisions.

B. Method

The method of this research is ex post facto research. This research design studies the phenomenon retrospectively. It examines existing conditions without manipulating variables and explores relationships or underlying factors. The

analysis method of this study is factor analysis which is a statistical method used to identify underlying dimensions (factors) from a set of observed variables. Specifically, it uses confirmatory factor analysis which can give information about the loading factor of items. The sample of this study is the group of internship student teachers, as many as 42 students majoring in mathematics department, Universitas Negeri Makassar. The data collection method is survey, a likert scale form, consisting of the indicators from the dimensions teacher beliefs and attitudes, technological knowledge and skills, school and institutional support, student characteristics and needs, curriculum and pedagogical considerations, and external factors with the total of ten items.

C. Findings and Discussions

After collecting data from the respondents, the loading factors of each item is shown at the Table 1.

Table 1. The Loading Factor of The Items

Factor	Loading Factor
Self-Efficacy	0,76
Perceived Value	0,79
Professional Development	0,43
Professional Development Opportunities	0,54
Administrative Support	0,63
Resources and Infrastructure	0,72
Student Interest and Motivation	0,81
Alignment with Curriculum Goals	0,64
Innovative Teaching Practices	0,53
Government Policies and Mandates	0,57
Societal and Cultural	0,61

The loading factors provide insight into the strength of each variable's contribution to the construct being measured. A loading factor closer to 1 indicates a stronger relationship, whereas lower values suggest weaker associations.

The data analysis using Confirmatory Factor Analysis (CFA) highlights several factors influencing student teachers' preferences for using technology in educational settings. The loading factors provide insight into the strength of each variable's contribution to the construct being measured. A loading factor closer to 1 indicates a stronger relationship, whereas lower values suggest weaker associations.

1. High-Impact Factors

- Student Interest and Motivation (0.81):

This factor has the highest loading, indicating that the enthusiasm and engagement of students significantly influence teachers' preferences for adopting technology. It suggests that teachers are more likely to embrace technology when they perceive it as a tool to captivate students and enhance their motivation to learn.

- Perceived Value (0.79):

This strong loading reflects how student teachers' perceptions of the utility and benefits of technology in achieving educational goals heavily influence their preferences. When technology is seen as adding clear value, teachers are more inclined to adopt it.

- Self-Efficacy (0.76):

Teachers' confidence in their ability to effectively use technology is another critical factor. High self-efficacy can reduce resistance to new tools and promote experimentation with innovative teaching methods.

- Resources and Infrastructure (0.72):

Adequate availability of technological tools, stable internet access, and well-maintained facilities strongly impact preferences. If teachers lack these resources, their willingness to integrate technology diminishes.

2. Moderate-Impact Factors

- Alignment with Curriculum Goals (0.64):

Technology's compatibility with the curriculum and learning objectives moderately affects its adoption. This reflects the importance of relevance; technology must support and not hinder educational standards.

- Administrative Support (0.63):

Administrative encouragement and backing moderately influence teacher preferences. Support in terms of funding, training opportunities, and policy alignment plays a critical role in fostering a conducive environment for technology integration.

- Societal and Cultural Factors (0.61):

Social acceptance and cultural norms regarding technology influence teachers'

preferences. This indicates a need for societal readiness and acceptance of technology in education for its successful integration.

3. Low-Impact Factors

- **Government Policies and Mandates (0.57):**
While mandates and policies provide a framework, their relatively lower impact suggests that mere enforcement without other supportive mechanisms may not sufficiently drive preferences.
- **Professional Development Opportunities (0.54):**
The availability of workshops and training has a limited impact. This could indicate that the quality and relevance of these opportunities are more important than their mere presence.
- **Innovative Teaching Practices (0.53):**
While innovation in teaching strategies can be influenced by technology, its lower loading factor may reflect variability in the willingness or ability of teachers to adopt such practices.
- **Professional Development (0.43):**
The weakest factor, suggesting that generic professional development unrelated to specific technological needs may not effectively influence preferences.

D. Conclusions and Implications

The findings indicate that student teachers are more influenced by factors that directly affect their confidence, perceived utility, and the practical feasibility of using technology. Enhancing student motivation, ensuring adequate resources, and aligning technology with curriculum goals are pivotal. Weak areas, such as professional development programs and policy influence, require attention to better support the integration of technology into teaching practices. Focusing on high-impact factors and addressing barriers in lower-impact areas can create a more conducive environment for technology adoption among student teachers.

Implications

Efforts to enhance technology adoption should focus on increasing student engagement, highlighting the practical value of technology, building teachers' self-efficacy, and ensuring sufficient resources. Furthermore, aligning technology with

curricula, improving administrative support, and fostering a supportive societal culture will further encourage technology adoption. Moreover, it needs to reevaluate the structure of professional development programs and ensure that government policies are implemented alongside resources and incentives that resonate with teachers' practical needs.

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