Perceived Usefulness, Perceived Ease of Use, Facilitating Condition, Social Influence, and Personal Innovativeness of Accounting Students Cloud Computing Adoption

Abstract. This study aims to test the influence of perceived usefulness, perceived ease of use, facilitating condition, social influence, and personal innovativeness in cloud computing adoption. This research is important because of the high demands of understanding student technology which can be started by adopting cloud computing in learning. Students can use cloud computing to share information, assignments, and work that can be accessed with various devices. This research was conducted on students at two state universities in Indonesia. The study used SEM in the analysis process. This research was conducted on students at two state universities in Indonesia. The results of questionnaire to 126 students indicate that the intention to use the cloud is determined by the perceived ease of use and facilitating condition. Three other variables used, perceived usefulness, social influence, and personal innovativeness were not shown to have an effect on cloud computing adoption intentions. The implication of this research is continuous research related to the use of information systems in learning.

Keywords: Perceived usefulness; perceived ease of use; facilitating condition; social influence; personal innovativeness.

Introduction

The accounting profession will face three main challenges that must be responded to by professional organizations, members of professional associations, and educational institutions (Islam, 2017). Furthermore, Islam (2017) mentions that the three challenges...
are industrial digitalization, harmonization of international reporting and inspection standards, and regulations. Satya (2018) explained that industrial digitization would have a negative impact on employment and conventional business entities. The low absorption of labor by the industrial world is because universities have been unable to produce graduates who meet industry needs (Setyaningrum et al., 2015). Optimization of student capabilities can be achieved with technology in learning.

Technological support in learning can be in the form of using blended learning (Sari, 2013; Herliani & Sibarani, 2017; Latifah & Susilowati, 2011; Murniati & Hermawan, 2017; and Harahap, 2015), as well as the use of software and strengthening of other IT support devices (Koerniawan & Kholifah, 2016; Muhsan, 2010; Taradipa et al., 2013; Yuliana & Mentari, 2012; Andayani et al., 2012; and Riadi and Ibrahim, 2014). Both methods can improve students’ learning achievement, critical thinking, and independent learning (Sari, 2013; Harahap, 2015; Taradipa et al., 2013). One of the IT support devices is cloud computing, a personal storage system that can be accessed on all devices only with internet services (Mutia, 2016).

The results of a Microsoft survey show that 92% of respondents prefer to store their data in cloud computing compared to traditional storage (Mutia, 2016). The reason for the results of this survey is the five advantages of the cloud, namely personal services according to needs, network access, resource storage, elastic speed, and scalable services (Najwa et al., 2020). This benefit causes many institutions such as hospitals (Gao & Sunyaev, 2019; Setyawan, 2015, 2016), educational institutions (Bennett & Weber, 2015; Kurniawan, 2015; Lenawati, 2018; Makori, 2016; Mutia, 2016; Najwa et al., 2020; Narkhede et al., 2018; Siregar & Fajrillah, 2016; Susanti & Putri, 2020; Vitalocca et al., 2015) and government agencies (Rizdawaty & Mustafidah, 2022) use the cloud in their activities.

The high use of cloud computing in educational institutions is due to the large benefits of using the cloud in learning activities. Mutia (2016) states that the cloud’s benefits are document and presentation sharing, storage media, entertainment services, communication, and social networking. Like students, for educational institutions, cloud computing is an effective and efficient adoption of technology (Najwa et al., 2020). In more detail, Najwa et al. (2020) describe the benefits of the cloud for educational institutions, namely the availability of online applications, the flexibility of the learning environment, support for mobile applications, intensive computing that supports teaching, learning and evaluation, scalability of learning systems and applications, and cost savings. Cost savings can be made because cloud computing can be developed independently by institutions at a certain cost (Bennett & Weber, 2015; Kurniawan, 2015; Makori, 2016; Siregar & Fajrillah, 2016; Susanti & Putri, 2020; Vitalocca et al., 2015) or using cloud computing that has been provided by IT providers such as Dropbox, OneDrive, Google Drive, Box, and iCloud (Lenawati, 2018; Mutia, 2016).

This study aims to determine the factors that influence the use of cloud computing that the provider has provided in accordance with the Technology Acceptance Model (TAM) developed by Davis (1989). TAM is the development of the Theory of Reasoned Action (TRA), which attempts to explain the measurement of attitude and behavior components. Confidence and external stimulus to the information system (Fatmawati, 2015). TRA can explain the behavior of information system users (Najwa et al., 2020) but cannot explain the perception of usefulness and
convenience, which greatly influences the
use of information systems. TAM was
developed by emphasizing these two
things: perceived usefulness and ease of
use of information systems. Fatmawati
(2015) states that TAM provides a basis
for determining internal factors that
impact information system users' beliefs,
attitudes, and goals. The advantage of the
TAM model is knowing the factors that
influence failure in using the system
because there is no user intention for
system adoption (Fatmawati, 2015).

This research is a development of
research (Thakur & Srivastava, 2014)
which examines the effect of perceived
usefulness, perceived ease of use,
facilitating condition, and personal
innovativeness on technology adoption
intentions by adding social influence
variables (Venkatesh et al., 2012). This
study differs from the research of Thakur
& Srivastava (2014) in selecting the
information system object used. Thakur &
Srivastava (2014) research was conducted
in the industrial sector related to the use of
online payments, while this research was
carried out in educational institutions
using cloud computing.

Sari (2013) states that blended
learning improved independence and
students' critical thinking. The indicators
of independence used are the initiative to
diagnose learning needs, the ability to
formulate learning goals, the ability to
identify learning resources, the ability to
choose and implement learning strategies,
and the ability to evaluate learning
outcomes. The achievement of
independence indicators has increased
from 14.3% in face-to-face learning to
85.7% in the third cycle of online learning.
The implementation of blended resulted in
a percentage of 55% in the first cycle,
85.7% in the second cycle, and 88.6% in
the third cycle. It indicates that blended
learning can increase students' independence and critical thinking.
Students' independence and critical thinking ability are capabilities that must
be possessed by students in the era of the
industrial revolution 4.0.

The message feature in the Moodle
LCMS can be used to interact directly,
either by lecturers to students or vice versa
(Harahap, 2015). Interaction between
fellow students or lecturers with all
students can be done on the discussion
forum menu; at this stage, the lecturer can
make a direct assessment based on student
responses to the topic being discussed
(Harahap, 2015). Documents that can be
inserted in this e-learning are documents in
PDF, DOC, XLS, ODT, et cetera.

Besides that, cloud accounts like; Box,
Google Drive, Dropbox and so on can also
be linked to e-learning, saving data space
and web hosting (Harahap, 2015). The
collection of tasks can be done promptly
by providing a limit on the collection of
tasks. The use of time limits causes
students to be unable to submit
assignments beyond the allotted time.
Feedback on task collection activities can
also be done directly (Harahap, 2015). The
use of the Moodle LCMS serves to make
learning time efficient and the evaluation
process more efficient, and increase
students' technological abilities (Harahap,
2015). However, this method requires the
support of a good internet and intranet
infrastructure from the institution to
minimize obstacles to using Moodle
LCMS.

The use of visual basic (VB) in
learning can increase student interest in
learning because it is more interesting for
students to solve practical cases compared
to manual systems (Andayani et al. 2012).
The purpose of using VB is to improve
students' cognitive abilities and skills in
utilizing information technology. The
advantage of using VB is the reciprocal
interaction between students and
computer programs (covering cases and
working papers), and there is no need for
many books and working papers. The trial
results show differences in the
operationalization of the program by
students with good
technology skills and students who do not have good computer basics, so lecturer assistance and monitoring are still needed for each student (Andayani et al. 2012). In addition, the work process is still vulnerable to making students take unethical actions in the form of copying and pasting other students' work.

The traditional TAM model states that the usability of information systems is an essential factor in system use (Najwa et al., 2020). Perceived usefulness is the perceived benefits of system users related to productivity, effectiveness and speed at work (Thakur and Srivastava, 2014). In higher education institutions, perceived usefulness accounts for about 65.2% of intentions to use cloud computing (Park and Kim, 2014). Najwa et al. (2020) state that perceived usefulness has a positive effect on cloud computing due to the belief that the use of cloud computing can increase efficiency, productivity and performance.

Research Method

This study uses a quantitative approach to determine the determinants of cloud adoption. This research was conducted on students of the Faculty of Economics at Manado State University and Maulana Malik Ibrahim State Islamic University Malang. Researchers used convenience sampling because of covid 19 required students to be outside the campus. There are 124 students as respondents. Researchers distributed questionnaires via the google form link from March 24, 2022, to March 29, 2022. Of the 124 students who were sampled, all students filled out the data completely. The questionnaire uses a Likert scale with a range of 1 to 5. The answers to each questionnaire vary from very positive to very negative, and there is 1 point statement with a negative statement to see the seriousness of the respondent in filling out the questionnaire.

The dependent variable in this study is the intention to use cloud computing. Broadly speaking, this variable explains the respondents' intention, whether at present or in the future, to use cloud computing. The researcher adopted this variable indicator from Thakur and Srivastava (2014), which contains three indicators. The independent variables in this study are perceived usefulness, perceived ease of use, social availability, social influence, and personal innovativeness. The first independent variable, perceived usefulness, was adopted from Thakur and Srivastava (2014). This variable explains that cloud computing has benefits in productivity, effectiveness and speed at work. There are 4 statement indicators in this variable. The second independent variable is perceived ease of use. This variable was adopted by Thakur and Srivastava (2014), which describe cloud computing as easy to run. There are 3 statement indicators in this variable. The third independent variable is the facilitating condition. This variable is also adopted from Thakur and Srivastava (2014), which describes what conditions can support someone using cloud computing, for example, having resources, knowledge and others. There are 4 statement indicators in this variable. The fourth variable is the social influence adopted by Venkatesh et al. (2012); this variable describes social influences such as family, environment or lecturers that influence students to adopt cloud computing. The fifth variable is personal innovation, adopted from Thakur and Srivastava (2014); this variable describes the individual's response to the new technology. This variable consists of 4 statement indicators.

Hypothesis testing was carried out using multiple linear regression analysis. This analysis measures the effect of more than one predictor variable (independent variable) on the dependent variable (dependent). The regressions in this
study are:

\[ \text{INT} = \alpha + \beta \text{USE} + \beta \text{EOU} + \beta \text{FAC} + \beta \text{SOC} + \beta \text{INN} + e \quad \ldots \quad (1) \]

INT was Intention to use cloud computing. USE was the Usefulness of cloud computing, EOU was the Ease of cloud computing, FAC was Conditions that facilitate, SOC was the social influence, and INN was Personal innovation.

**Results and Discussion**

**Research Results**

Questionnaires were distributed to 124 accounting students at Manado State University and Malang State Islamic University. From all research samples, all were filled out completely. Table 1 summarizes the descriptive analysis of the questionnaire distribution.

<table>
<thead>
<tr>
<th></th>
<th>USE</th>
<th>EOU</th>
<th>FAC</th>
<th>SOC</th>
<th>INN</th>
<th>INT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>16.4435</td>
<td>12.2903</td>
<td>15.3871</td>
<td>10.8790</td>
<td>15.1290</td>
<td>12.3629</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>2.71192</td>
<td>2.17440</td>
<td>3.01678</td>
<td>2.59641</td>
<td>2.86546</td>
<td>2.34550</td>
</tr>
<tr>
<td>Maximum</td>
<td>20.00</td>
<td>15.00</td>
<td>20.00</td>
<td>15.00</td>
<td>20.00</td>
<td>15.00</td>
</tr>
</tbody>
</table>

The average value of each variable shows; 54% of students find cloud storage useful. 52% of students find the cloud easy to use. 51% of students have the facility to use the cloud. Less than half of college students (46%) influence them to use the cloud. 57% of students have an innovative nature related to new technology, and the last 55% intend to use the cloud. These results show that students at the two universities are accustomed to using information technology in the learning process. The system is developed by the university's technology development department or a paid system provided by other parties, such as Google Drive and Dropbox.

The researcher conducted a multicollinearity test by looking at the tolerance value and VIF and found that the tolerance value was above 0.1 and the VIF value was below 10 for all variables. Next, the normality and heteroscedasticity tests were carried out, and the data were normally distributed and did not form a specific pattern.

**Table 2. The Validity and Reliability Instrument**

<table>
<thead>
<tr>
<th>Validity</th>
<th>Reliability</th>
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<tbody>
<tr>
<td>Anti-image Correlation</td>
<td>Cronbach’s alpha</td>
</tr>
<tr>
<td>USE1</td>
<td>0.860</td>
</tr>
<tr>
<td>USE2</td>
<td>0.894</td>
</tr>
<tr>
<td>USE3</td>
<td>0.800</td>
</tr>
<tr>
<td>USE4</td>
<td>0.835</td>
</tr>
<tr>
<td>EOU1</td>
<td>0.825</td>
</tr>
<tr>
<td>EOU2</td>
<td>0.838</td>
</tr>
<tr>
<td>EOU3</td>
<td>0.798</td>
</tr>
</tbody>
</table>
Table 2 corroborates the results of the study. The outer value model of all items in the questionnaire has a value of > 0.05. It indicates that 21 statement items from 6 variables in this study are declared valid. While the Cronbach value > 0.06 indicates that all research variables are reliable. These results indicate that the instrument can be used to collect data.

The results of hypothesis testing with PLS are presented in figure 1.

**Figure 1. PLS Result**

The results of hypothesis testing using PLS are two variables that have a positive effect on student's intention to use cloud computing (significant at level 0.05), namely the perceived ease of using cloud computing and the availability of student facilities in using cloud computing. Meanwhile, other variables such as perceived ease of use, social influence and personal innovativeness did...
not determine students' intention to use cloud computing.

Discussion

The traditional TAM model states that the ease of operating an information system is an important factor in the use of the system (Najwa et al., 2020). Perceived usefulness is the ease with which users run information systems (Thakur and Srivastava, 2014). Perceived usefulness has a positive effect on the use of information systems (Thakur and Srivastava, 2014). Najwa et al. (2020) states that the perceived usefulness has a positive effect on cloud computing because of the belief that the use of cloud computing can be done easily. This study's results differ from those of previous studies that found a positive effect of perceived usefulness on cloud computing. The difference between the results of this study and previous studies could be due to the use of a more integrated learning system at the two universities. Integrating the learning system through e-learning developed at the two universities shows that cloud computing is no more useful than the system developed by the agency itself. The features of e-learning can be used to interact directly with either lecturer to students or vice versa (Harahap, 2015). Interaction between fellow students or lecturers with all students can be done on the discussion forum menu; at this stage, the lecturer can make a direct assessment based on student responses to the topic being discussed (Harahap, 2015). In addition, e-learning provides a place for collecting student assignments that is more integrated with the assessment system, and absenteeism causes more interaction between lecturers and students in e-learning.

This research has succeeded in empirically proving the effect of perceived ease of use on accounting students' intentions to use cloud computing. These results are consistent with the concept of the traditional TAM model regarding the ease of operating information systems as an important factor in system use (Najwa et al., 2020). Perception of convenience is the ease with which users run information systems (Thakur and Srivastava, 2014). Manado State University and UIN Malang have e-learning integrated with the academic system to support learning. E-learning is beneficial in learning but is relatively more challenging to access than cloud computing. The difficulty is between the file type and the file size that students can upload.

Facilitating condition and speed of operating information systems affect the intention to use information systems (Thakur and Srivastava, 2014). Thakur & Srivastava (2014) describe what conditions can support someone using information systems, for example having resources, knowledge and others. In educational institutions, students with complete facilities will choose to use cloud computing because of the high intensity of sharing and storing information to support smooth learning (Najwa et al., 2020). This study found a positive effect of facility availability on the intention to use cloud computing. Thakur & Srivastava (2014) describe what conditions can support someone using information systems, for example, having resources, knowledge and others. In educational institutions, students with complete facilities will use cloud computing because of the high intensity of sharing and storing information to support smooth learning (Najwa et al., 2020).

Social influence is a form of consideration for accepting behavior in accordance with emotional closeness in the family, work, or education environment (Venkatesh et al., 2012). Social influence describes the feeling of wanting to be recognized by the environment for the use of information systems. The higher the feeling of wanting to be recognized by the
the higher the likelihood of cloud computing. This study failed to find the effect of social influence on the intention to use cloud computing. Social influence is a form of consideration for acceptable behavior in accordance with emotional closeness in the family, work, or education environment (Venkatesh et al., 2012). Social influence describes the feeling of wanting to be recognized by the environment for using information systems. These results indicate that the pandemic condition can make students freer from pressure due to the lack of direct interaction in the learning process.

Thakur & Srivastava (2014) stated that personal innovativeness describes the response of the individual's personal nature in seeing new technology. This variable is important because of the paradox in the adoption of cloud computing, namely the high need for cloud use and the data security risks that surround it (Najwa et al., 2020). This study failed to find the effect of personal innovativeness on cloud computing. In contrast to the results of previous studies, these results indicate that students prefer to be careful and maintain privacy. The high-security risk of the cloud could be why students are reluctant to adopt the cloud.

**Conclusion**

High technological progress is not always directly proportional to the speed of the world of education to adopt the latest information systems. Cloud computing is one of the eases of technology in sharing documents and work activities that can be accessed on various devices. This study's five determinants of cloud adoption intentions are perceived usefulness, perceived ease of use, facilitating condition, social influence, and personal innovativeness. The results of this study indicate that perceived ease of use and facilitating conditions influence cloud computing, while the other three variables have not been proven to affect cloud computing. Future research can use other question items to measure the security of using cloud computing. It is important because the ease of access to the cloud from different devices makes it vulnerable to data theft by irresponsible parties. The limitation of this research is the use of samples at universities with their learning technology so that the use of cloud computing can be less.

**References**


Gao, F., & Sunyaev, A. (2019). Context matters: A review of the determinant factors in the decision to adopt cloud computing in


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