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Research Article

The Impact of Using the Internet for Learning for Students with Technology Acceptance Model (TAM)

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Abstract: The development of the internet can provide convenience to humans in general, and students as one of the educational academics can provide changes in their life processes. The technique used in this study is Generalized Least Squares (GLS), which is proxied by using asymptotic covariance matrix data. The purpose of the study is to analyze the impact of the use of technology, in this case, is the internet in the learning process carried out by students. There are four constructs used in the TAM research, namely Perceived Ease of Use, Perceived Usefulness, Attitude Toward Using, and Actual Technology Usage. The research has three indicators for each latent variable. In this case, the latent variables are four. Then it can conclude that the number of samples used is 120. The sampling technique in this study uses Nonprobability sampling. The research hypothesis will test by analysis of SEM (Structural Equation Model) with the IBM AMOS (Analysis of Moment Structure) Program. The technique for using Generalized Least Squares (GLS), which is proxied by using the asymptotic covariance matrix data. From the results of the study, it found that this model has shown an overview of the aspects of the behavior of internet users that use for practical learning, where many users can efficiently operate the internet because it fits with what they need. Technology Acceptance Model (TAM) provides a reliable and straightforward explanation in accepting the technology and behavior of its users.

Keywords: Actual Usage, Attitude Toward Using, Structural Equation Model, Perceived Usefulness, Perceived Ease of Use.

1. Introduction

The emergence of new technology, especially in the field of information technology communication, will always produce a reaction in its users. The reaction can be the acceptance of the latest technology or even the rejection of the presence of the new technology [1]. No blocking of technology enters the business process (in this case, the world of education), it is necessary to know the extent of the acceptance of the technology by students.

Internet technology, as a medium of informative, communicative, and up-to-date information, has an extensive range. Internet technology can even say to be almost unlimited. The internet can provide convenience to humans in general and students as one of the educational academics can provide changes in their life processes [2]. The presence of the internet will provide answers when time is money. Communicating remotely can use e-mail facilities, which are real time. The development of Internet technology is very rapid and spread throughout the world has used by various countries, institutions, and experts for various interests, including the world of education [1], [3]. The internet has become a separate need for the world of education Internet technology makes it easy for anyone to get any information from anywhere and anytime easily and quickly [4].

The information available in various data centers on various computers in the world. If the computers connected in the Internet network, we can access it from anywhere. It is one of the advantages of learning through the Internet. The internet can formulate as a large group of computers in a network that is joined together so that many users can share their resources widely [5]. The existence of the internet allows computers to relate to each

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other and can transmit data, both structured data and unstructured data. It can also say, the internet is a network of computers that are connected by computer networks throughout the world [6], [7].

The role of the Internet is very profitable because of its ability to process data with a substantial amount. Information technology has become the largest computer network in the world, which can function adequately if supported by computer devices with good software, and with well-trained teachers. Using the Internet with all its facilities will make it easy to access various information for education that can directly increase students' knowledge for their success in learning because the Internet is the primary data source and knowledge.

Students can act as researchers, become analysts, not just consumers of information. They analyze information that is relevant to learning and conduct searches that match their real life. Students and teachers do not need to be physically present in the classroom because students can learn teaching materials and do learning and exam assignments by accessing a predefined computer network online. The use of the Internet as a learning media conditions student to learn independently. Through independent study, students become doers, as well as thinkers [8]. Students can access online from various libraries, museums, databases, and get primary sources on various historical events, biographies, recordings, reports, statistical data [9], [10].

The concept of Technology Acceptance Model (TAM) developed by Davis [11], offers a theory as a basis for learning and understanding user behavior in receiving and using an information system. Expansion of the concept of Technology Acceptance Model (TAM) expected to help predict one's attitude and acceptance of technology and can provide the necessary information needed regarding the factors that drive the attitudes of these individuals [12].

Technology Acceptance Model (TAM) has a theory that one's intention in using technology is determined by two factors, namely perceived usefulness is the level of one's belief that the use of technology will improve performance and perceived ease of use is the level of one's belief that using technology makes it easier in completion of work [13].

The TAM model can explain that user perceptions will determine his attitude in the use of information technology and describe more clearly the use of information technology that influenced by usefulness and ease of use. There are four constructs used in the TAM research, namely: Perceived Ease of Use, Perceived Usefulness, Attitude Toward Using, and Actual Technology Usage.

Several research models have conducted to analyze and understand the factors that influence the acceptance of the use of computer technology, one of which is the Technology Acceptance Model (TAM). TAM developed from psychological theories that explain the behavior of computer users based on belief, attitudes, desires, and the relationship of user behavior. The purpose of this model is to explain the factors of user behavior towards acceptance of technology use.

This model places the attitude factors of each user behavior with two variables, namely: Ease of use (ease of use) and Usefulness. Both variables can explain aspects of user behavior that explain that the user's perception will determine his attitude in the use of these technologies. This model more clearly illustrates that acceptance of the use of technology influenced by usefulness and ease of use. The perception of ease of use has a causal effect on perceived usefulness.

Feature design directly affects perceived benefits and perceived ease of use. Because design features fall into the category of external variables in the Fishbein paradigm, they do not theorize to have a direct effect on attitudes or behavior, rather than influencing these variables only directly through perceived benefits and perceived ease of use.

This paper explains the development of the model design to measure the acceptance of internet technology by students. This model designed to be a tool to study assimilation of internet use and the dissemination of technology for learning carried out at universities.

2. Research Methods

3.1. Sample Size (Respondents)

The sample size should not be small because the Structural Equation Model (SEM) depends on tests that are sensitive to sample size and the magnitude of differences in covariant matrices [14]. In theory, for sample sizes ranging from 200 – 400 for models that have indicators between 10-15 or according to Hair [15], the representative sample size is dependent on the number of indicators multiplied by 5 – 10. Samples below 100 will be less favorable if using SEM. The research has three indicators for each latent variable. In this case, the latent variables are 4 (four). Then it can conclude that the number of samples used is 12 x 10 = 120 samples.

3.2. Procedure

The sampling technique in this study used Nonprobability sampling. Nonprobability sampling is a technique used for sampling where each member of the population does not have the same opportunity or opportunity as a sample. In this study using a purposive sampling technique is a technique in sampling based on criteria. The criteria for students who use as respondents in this study are respondents who are Internet users for the learning process.

3.3. Data Collection

The data collected will processed and analyzed to obtain research results. This study uses data collection methods using questionnaire distribution. This method requires relatively little cost, but it must also be admitted that it has the disadvantage of a low response rate [16]. This questionnaire given directly to the respondents, namely University students, to overcome the low response rate. Data collection techniques used were questionnaire techniques. Questionnaire technique is a way to obtain data directly from respondents using a questionnaire about the measured variables [17].

There are four instruments used to measure each variable. These instruments used to measure the variables Perceived Ease of Use, Perceived Usefulness, Attitude Toward Using, and Actual Technology Usage. The research instrument developed using a Likert scale with four scales; the lowest score given a score of 1, and the highest given a score of 4 (four). Alternative answers available were "strongly agree," "agree," "disagree," and "strongly disagree." The Likert scale used because this scale can reveal the intensity of the attitudes, and behavior or feelings of respondents [18].

3.4. Data Analysis

The research hypothesis will be tested by analysis of SEM (Structural Equation Model) with the AMOS (Analysis of Moment Structure) program. SEM is a statistical analysis tool that used to complete multilevel research models simultaneously. SEM can used to solve equations with variables that form paths. Joreskog and Sorbom [19], [20], and Joreskog [21], argue that ordinal data (data used in this study) must be treated as ordinal data and may not treat as continuous data. The analytical method that will apply is Generalized Least Squares (GLS) and uses polychoric correlation and additional data asymptotic covariance matrix.

Analysis of structural equation models with ordinal data, raw data cannot used to do analysis. The raw data must convert into a polychoric correlation. Polychoric correlation is a correlation matrix where all variables have an ordinal scale and treated as ordinal data. Joreskog [22], recommends not using the Maximum Likelihood method in using SEM with ordinal data, because it will produce parameter estimates and biased fit models. The technique used in this study is Generalized Least Squares (GLS), which is proxied by using asymptotic covariance matrix data.

3. Results and Discussions

3.1. Evaluation of Data Normality

The assumption of normality of the data tested by looking at the value of CR range between ± 2.58, and it can say that the data typically distributed. Based on the data contained in the results of data processing, it can see that none of the univariate values are outside the range of values ± 2.58, and the multivariate value is 7.942. Therefore, the data said to be normally distributed.

3.2. Outlier Evaluation

Outliers are observations that appear with extreme values because of the combination of unique characteristics they have that look far different from other observations [15]. Based on the results of the Mahalanobis Distance test, it can see that the values of p1 and p2 are 0.05, which means there are no outliers.

3.3. Evaluation of Multicollinearity and Singularity

Based on SEM output analyzed using IBM AMOS 22, the determinant of the sample covariance matrix is 0.000000000273 which means the dimension value or construct is <0.79 and this means that it is not affected by multicollinearity; therefore, this data is feasible [14].

3.4. Goodness of Fit (GOF)

This stage intended to evaluate the degree of compatibility or Goodness of Fit (GOF) between the data and the model. A model said to fit if the model covariance matrix is the same as the covariance of the data matrix. Evaluation of Goodness of Fit Values that have obtained from the results of SEM analysis with the IBM AMOS 22 Program as follows:

- Recommended RMSEA (Root Mean Square Error of Approximation) value <0.080. Then the RMSEA value obtained from the calculation results is equal to 0.001, which means that it is smaller than the recommended value then the results indicate a model fit [23], [24].
- Recommended GFI (Goodness of Fit Index) value >0.900. Then the GFI value obtained from the calculation results is equal to 0.971, which means that it is greater than the recommended value so that the results indicate the model fit [19], [25].
- The recommended Tucker Lewis Index (TLI) and Comparative Fit Index (CFI) >0.900. Then the TLI value obtained from the calculation results is equal to 1,000 and the CFI is equal to 1.020, which means that it is greater than the recommended value then the results indicate a model fit [26], [27].
- The recommended Parsimony Normed Fit Indices (PNFI) and Parsimony Comparative Fit Indices (PCFI) values are >0.500. Then the TLI value obtained from the calculation results is equal to 1.000 and the CFI is equal to 1.024, which means that it is greater than the recommended value so that the results indicate the model fit [28], [29].
- Then AGFI (Adjusted Goodness of Fit Index) has a value of 0.925 which means that if the value is greater than 0.90, the model has a good overall model suitability [30].

- Furthermore, CMIN/DF in this study has a value of 0.851 where this value is smaller than 2.00 (according to the terms Goodness of Fit < 2.00) called the fit model which is the value of Chi-Square relative magnitude less than 0.2 with tolerance below 0.3 which is an indicator of a model and data match in this study [31], [32].

3.5. The effect of variables perceived ease of use, perceived usefulness, and attitude toward using on actual usage variables

Technology Acceptance Model (TAM) has combined the attitude (user attitude) of what done. Davis [11], has developed a model that explains individual behavior in receiving information technology called the Technology Acceptance Model (TAM). Technology Acceptance Model (TAM) developed from a psychological theory that explains the behavior of users starting from belief, attitude, intention, and the relationship of user behavior. This model is in the attitude of each user behavior and has two variables, namely the ease of use and usefulness.

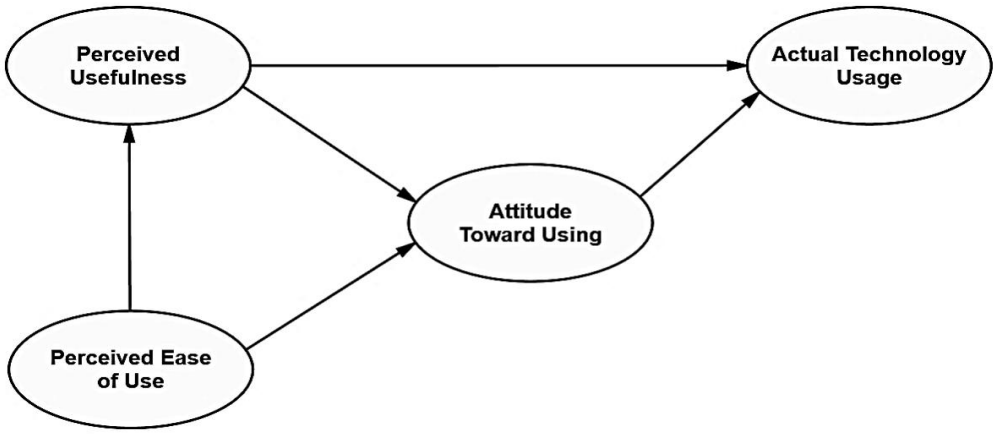

Figure 1. Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) is a model designed to predict the acceptance of computer applications and the factors that are directly related to it and Technology Acceptance Model (TAM) have the purpose of explaining and estimating acceptance of users of the factors that influence acceptance of a technology in the organization and Technology Acceptance Model (TAM) describes a causal relationship between beliefs and behaviors, goals/needs, and actual use of users of an information system.

The TAM model explains in more detail about the acceptance of the internet with certain dimensions that can easily affect internet users. This model places the trust factor of each user behavior with two variables, namely usefulness and ease of use.

Table 1. Standardized Regression Weights

			Estimate	Probability (p)	Result
Attitude Toward Using	←	Perceived Usefulness	0.741	0.018	Significant
Attitude Toward Using	←	Perceived Ease of Use	0.731	0.008	Significant
Actual Technology Usage	←	Perceived Usefulness	0.650	0.022	Significant
Actual Technology Usage	←	Attitude Toward Using	0.827	0.000	Significant
Perceived Usefulness	←	Perceived Ease of Use	0.527	0.011	Significant

This model has shown to provide an overview of the aspects of computer user behavior for experiential learning, where many users can efficiently operate the internet because it fits with what they want. Mathieson [33], states that the tendency for End-User Computing to occur has caused different reactions in attitudes and behavior for users of information systems. Davis [34], states that the behavior aspect in adopting information technology is an important thing to note because the interaction between users and computers is the result of the influence of perceptions, attitudes, affections as behavioral aspects that exist in individuals as users.

The various facilities provided by the internet to users have a positive impact that makes internet users continue to increase access. Users, in this case, our students no longer just using to find learning material but have shared and communicated with each other. According to Adams, Nelson, & Todd [35], the intensity of use and interaction between users and systems can also indicate the ease of use. Systems that use more often indicate that the system is easier to understand, more comfortable to operate, and easier to use. Based on these results, it can conclude that the ease of use of a computer depends on the level of trust of someone that the computer can easily understood and

the system used can easily understood, operated and used. This result is consistent with research that states that if someone feels the internet is easy to use, then that person will be more or more willing to use it again [36]–[38], [39], [40]. Perceived ease of use is a level of one has belief that computers can easily understood. Users, in this case, our students no longer just using to find learning material but have shared and communicated with each other.

Usefulness by Davis [31], interpreted as a level where people believe that the use of technology will improve their work performance. The basis of the measurement of benefits is the frequency of use and diversity of applications that run. A positive and significant relationship between usefulness and attitude toward using the internet also found in Jahangir and Begum [41]. A positive attitude found in a person towards the internet will encourage the person to optimize the usability or use of the internet. Users, in this case, our students no longer just using to find learning material but have shared and communicated with each other.

The attitude of using the internet by students is a form of feeling that requires a more personal system so that if a system meets the needs of students, it will automatically continue to use it. In the view of internet users, the students that the convenience and benefits provided will increase the effectiveness of doing tasks and much information obtained from the internet can add new insights and knowledge to students.

The attitude towards the application of something according to Aakers and Myers [42], is a pro or contra attitude towards the application of a product. The attitude of the pros or cons of a product can apply to predict the behavior or intention of someone to use a product or not to use it. The attitude towards the application of technology (attitude toward using technology), interpreted as an evaluation of the user about his curiosity in using technology.

Perceived ease of use itself is a belief about the decision-making process in the use of information systems (internet). If there is no trust in the information system used, the user will not use it. Indicators of perceived ease of use are information and technology that are easy to learn, easy to be skilled in using information and technology, and information and technology are easy to operate [43].

The ease of use perspective can convince users that the information technology that will applied is an easy matter and not a burden for them. ICTs that are not difficult to use will continue to applied by them.

Davis [44], in his book, also states that the perceived ease of use is a level where a person believes that the use of a system can reduces one's effort to do something. The frequency of use and interaction between users (users) with the system is also able to show the ease of use. Systems that more often used show that the system is better known, more comfortable to operate, and easier to use by users.

Some studies use the TAM research model by adding external variables that influence the TAM model. The renewal of this research is to develop the TAM research model by using system quality as an external variable. Cheng-Tsung [45], combine the Theory of Planned Behavior (TPB) [46], and Technology Acceptance Model (TAM) models to examine the model of the level of tax filing online in Taiwan. From the results of the study it found that attitudes are the dominant factors that significantly affect online tax filing, but attitude factors strongly influenced by Perceived Usefulness, perceived ease of use. Both TAM and TPB obtained correlations and can explain the behavior of variables.

Michael Thomas [47], in his research, stated that the quality of the system is one of the external variables of TAM. However, no one has researched using system quality as an external variable TAM, which is also a variable from DeLone and McLean's model [48]. Another TAM external variable which is also a variable from the success of DeLone and McLean's information system is the quality of information and research related to information quality are Lucas and Spitler [49], and Lederer [50], by definition the perception how well the system performs tasks that match with job goals.

If carefully designed, electronic learning can increase the level of learning interactions, both between students and teachers/instructors, between fellow students and between students with enhancing interactivity. Unlike the case with conventional learning. Not all students in regular learning activities can dare, or can raise questions or express their opinions in the discussion. Given the learning resources that have packaged electronically and available to accessed by students through the internet, students can interact with these learning sources anytime and from anywhere [51]. Likewise, with the tasks of learning activities, can submitted to the instructor once done.

Because even though we cannot avoid globalization, one of which is to improve learning communication and information technology. Thus, it can see that other media that have use as educational media so far, the internet also has equally great opportunities, and maybe even because of its uniqueness that can access all information from around the world. The internet can be the most prominent learning media and widely used in schools, especially universities with national standards and international standard universities.

The internet is an alternative learning resource that is quite effective and efficient. So far, what is commonly known as a learning resource is books and teachers. In fact, the longer the traditional learning resources are increasingly limited, both in number and distribution. One way to overcome this is by using the internet as a source of information. In this case, the internet can be a tool that is more natural to complement. Not replace the role of the

teacher. The use of learning resources using technology-based tools with electronic media currently very commonly used in education circles. For example, the spread of knowledge through the screening of a learning program or educational film from a video cassette, as well as the use of audio media such as tapes. Until the use of projection media with computer aids. All these media functions almost the same as books, namely programs that run to increase knowledge.

4. Conclusions

The use of the internet as a learning medium is essential. The internet in learning is vital because there are uses of several internet applications that provide convenience in the learning process. Besides, the existence of the internet as a learning medium can help build a more exciting learning process. In the world of education, the internet has many roles and functions that are very supportive or helpful in the learning process. The internet also has many benefits that will facilitate us in the learning process.

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