Analysis of the Use of Distance Learning Technology in Universities in the Riau Islands Province with the Technology Acceptance Model (TAM)

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Abstract: The problem that is the focus of the research is the use of distance learning technology at universities in the Riau Islands Province using the Technology Acceptance Model approach. This research aims to analyze user perceptions on ease of use, usability, usage behavior, and use of distance learning technology. This research aims to determine user perceptions of distance learning technology in universities in the Riau Islands Province. Apart from that, this research also aims to evaluate the influence of the ease of use perspective, usability perspective, and usage behavior on the use of distance learning technology. The research results show that research respondents, who are academics and staff at universities in the Riau Islands Province, have a high perception of distance learning technology. From the test results, it was found that there was no significant influence between the ease of se perspective and the usability perspective on the use of distance learning technology. However, usage behavior has a significant influence on the use of distance learning technology. Apart from that, these three variables together have an influence of 69.70% on the use of distance learning technology.

Keywords: Analysis; Distance learning technology; TAM

Introduction

The Riau Islands Province has been formed as a result of the decision to expand from the Riau region as its home province (Kusumaningtyas & Aldrian, 2016). This result is in line with the spirit of reform as well as the regional autonomy law that was enacted in 1998, in which the leaders and communities of the district in the Riau archipelago jointly proposed that a new province be formed separately from the province of Riau. The result was the formation of the Riau Archipelago province with the capital city of Tanjung Pinang. Riau Archipelago Province is also a province that ranks 32 among the provinces in Indonesia. This province includes Batam City, Tanjung Pinang City, Karimun Regency, Bintan Regency, Lingga Regency, and Natuna Regency. In total, there are 2 cities, with 5 regencies, and 59 sub-districts with a total of 2.41 islands spread across the Riau Archipelago Province (Silva & Souza, 2016). The competitive ability of an area can be seen in terms of the economy, human resources, natural resources, and infrastructure (Sinarti et al., 2018); while based on three important priorities originating from the vision and mission as well as the action program of the President of Indonesia, Joko Widodo, known as (Suartini & Rohaya, 2022) there are three things, namely improving the quality of human life; increasing productivity and competitiveness in global markets; achieving economic independence by leveraging key economic sectors and domestic resources. It can be seen that one of the important priorities relates to improving the quality of human life, one of which is in the Education sector; especially in this research in the higher education sector.

Higher education as an operational part of the education sector, has a very noble mission, namely educating the nation, so that it can increase economic growth and regional leadership that is innovative and highly competitive. Higher education has operational

elements in the academic field, namely lecturers and education staff who jointly carry out the tri dharma of higher education to achieve the university's vision. In connection with the COVID-19 pandemic conditions in 2020, distance learning has been carried out at universities in Indonesia (Syah, 2020) and also in Riau Islands. The method of distant learning is carried out using various learning methods, in the form of project-based learning, collaboration-based learning, and discussion; processes that were previously carried out offline, are now carried out online with various information technology utilities; Technology transfers itself, as well as the technological change process's creation, implementation, and adaptation, are among the most important factors to consider (Alkhazaleh et al., 2022), both with social media and by using video conferencing utilities such as MS Teams, Google Meet, and various other utilities.

This has been done for 1 full semester of learning in 2020, at various universities in the Riau Islands. This is a challenge for universities (Mancini & González, 2021) how is the Assessment Analysis regarding the Use of Moodle Application-based Technology for Universities offering distance education in the Riau Islands; this study will use the Technology Acceptance Model (TAM) as the model used. Previous research has only analyzed the level of student satisfaction based on Big Data technology on academic administrative data, the Balanced Scorecard approach, and an internal business perspective (Farhan, 2020). Researchers want to know how to analyze using the TAM and distance learning technology at universities in the Riau Islands. Based on the background that has been previously disclosed, the problem formulation of this research is as follows: Does the ease of use Perspective have an impact that is significant to the Use of Distance Learning Technology? ;Does the Usability Perspective have an impact that is significant on the Use of Distance Learning Technology?; Does usage behavior have an impact that is significant on the use of distance learning technology?

The contributions of this research are: As input for higher education management in managing distance learning based on Distance Learning Technology; As input for teaching lecturers so that they can carry out a better teaching process than what has been done before; and as instructional tools for analyzing the outcomes of the teaching and learning process in the setting of a university campus in the Riau Islands. Learning in a network, online, or distance learning has the aim of meeting an educational standard through the use of an information technology base with the use of gadgets or computer devices that are interconnected between students and teachers so that by utilizing this, the teaching process can still be carried out properly (Ketut

Sudarsana et al., 2019). Distance learning technology has played an important role in maintaining the continuation of the distance learning process (Abdul Latip, 2020). The level of student satisfaction is part of a measure in measuring distance learning.

One way is to use the EUCS (End User Computing) method so that learning effectiveness can be carried out. The indicators used are accuracy, content, ease of use, format, and timeliness (Sugandi & Halim, 2020). Other elements that have a big impact on how well distant learning technology works include social interaction, organizational norms, learner motivation, both parties' information technology skills, readiness on the individual level, participation, openness to new ideas, and technical challenges (Loban' et al., 2020). Distance learning is also an interactive process that has a purpose, providing interaction between learners and teachers and using assistive devices, without depending on certain locations and certain places, ease of use, format, and timeliness (Fiyah et al., 2019).

Several other elements, including interpersonal communication, corporate norms, learner motivation, both parties' information technology skills, readiness on the part of the individual, participation, openness to new ideas, and technical challenges, have a significant impact on how effective distance learning technology is (Dwivedi et al., 2023). Distance learning is also an interactive process that has a purpose, providing interaction between learners and teachers and using assistive devices, without depending on certain locations and certain places (Cavalcanti et al., 2021). Other factors that have a significant impact on the effectiveness of distance learning technology include social interaction, organizational norms, learner motivation, both parties' information technology skills, readiness on the individual level, participation, openness to new ideas, and technical challenges. Distance learning is also an interactive process that has a purpose, providing interaction between learners and teachers and using assistive devices, without depending on certain locations and certain places (Rahayu et al., 2017).

The Technology Acceptance Model (TAM) follows the model from Davis in 1986 and was further developed to analyze student satisfaction levels into Interface Design, Perceived Ease of Use, Attitude Toward Using, and Behavioral Intention to Use (Aeni et al., 2020). TAM is precisely a model that has been developed to analyze user acceptance of the technology used; It is also a theoretical framework to assess how people make decisions based on the adoption of new technologies. Ease of Use Perspective is a level where users have confidence where they feel that there is no more effort in using technology (Baki et al., 2021); this is also supported by other researchers who say that the Ease of Use

Perspective measures how well users can use technology in general or electronic resources as a result of their level of skills and competencies, which other researchers support. The usability perspective can be seen as a significant factor that positively encourages the intention to use something in the future (Alqirnas, 2021). Other researchers (Davoodi et al., 2021) say that the Usability Perspective refers to a level where one formulates the use of a system to increase ownership. The usability perspective is also said to be the use of information technology to improve performance and at the same time benefit users (Adeyemi et al., 2020).

Usage behavior is a behavior towards the use of information technology and is an indication of the acceptance or rejection of a technology. This is supported by other researchers (Osswald et al., 2012), who state that User Behavior is the feelings, thoughts, and perceptions of consumers, directly or indirectly, in the behavior of using a technology. Meanwhile, other researchers (Rotib et al., 2021) stated that user behavior positively and significantly influences people's intentions to use marketplaces.

Method

Analysis Techniques

This study uses a quantitative methodology to examine the effects of distance learning. The study session lasted six months, specifically the odd semester of the school year 2020–2021. The research was conducted at universities in the Riau Islands. Universities provide e-learning platforms, and quantitative research in the Riau Islands is based on a population of 20.52 students. The number of questionnaires to be addressed to a population of 100 students in the Riau Islands province during the odd semester of 2020 will be decided using a sampling process with an anticipated response rate that is expected to fully return or 100%. The following calculations are made for the sample size using the Slovin formula: $n = N/((Nxd2) + 1)$, where d is the margin of error, n is the sample, and N is the population so that the next computation can be made: $n = 20803$ $((20803 \times 10\%2) +1) = 99.50 = 100$. According to the calculation results that have been stated, the minimum number of samples in this study is 100 respondents.

Method of Collecting Data

Convenience sampling was used in this study's data collection process (Scholtz, 2021). As long as the college facilitates eLearning, any participant in distance learning and online courses can serve as a sample. Manual and electronic e-questionnaires were used to collect the questionnaires. Direct hand distribution to students was done, and emails, mobile apps, and online learning forums all provided links to questionnaires. Google Docs was used to distribute online surveys. A Likert scale (Firman & Rahayu, 2020), with a range of 1 to 5, is used in the survey. firmly opposed on a scale of 1 and firmly in agreement on a scale of 5.

Researchers conducted the preliminary study by distributing 30 questionnaires to conduct reliability and validity testing before disseminating the survey to all respondents. Following the preliminary research distribution, a sample of 100 + 10% = 110 was taken from the 5 universities that were respondents (already had e-learning sites: see the table below), 30 respondents would be asked to fill out the preliminary survey used in the study.

Table 1. Universities in the Riau Islands with their eLearning Websites

Name	Website	Phone number	E-mail	E-learning website	Number of Students
Batam International University	www.uib.ac.id	No_Tel	humas@uib.ac.id	http://elearning.uib.ac.id/	3.62
Batam Putera University	www.upbatam.ac.id	0778 6002999,7437111	info@upbatam.ac.id	http://elearning.upbatam.ac.id/login/forgot_password.php	5.92
Batam University	univbatam.ac.id	+62-82391287111	p3t.uniba@gmail.com	http://elearning.univbatam.ac.id/login/forgot_password.php	2.81
Riau Archipelago University	www.unrika.ac.id	+62-778-7485055	humas@unrika.ac.id	http://www.unrika.ac.id/e-learning/	7.45
Universal University	www.uvers.ac.id	+62-778-392752	humas@uvers.ac.id	https://elearning.uvers.ac.id/	7.12
Total	www.uib.ac.id	+62-778-473399, 466869	humas@uib.ac.id	http://elearning.uib.ac.id/	20.52

Research Variable

Conceptually, based on the framework of research, the variable-variable of this research can be classified as follows:

Independent Variable

Research variables that become independent variables are the perspective of use and the perspective of ease of use.

Dependent Variable

The research variable that becomes the dependent variable is the use of distance learning technology.
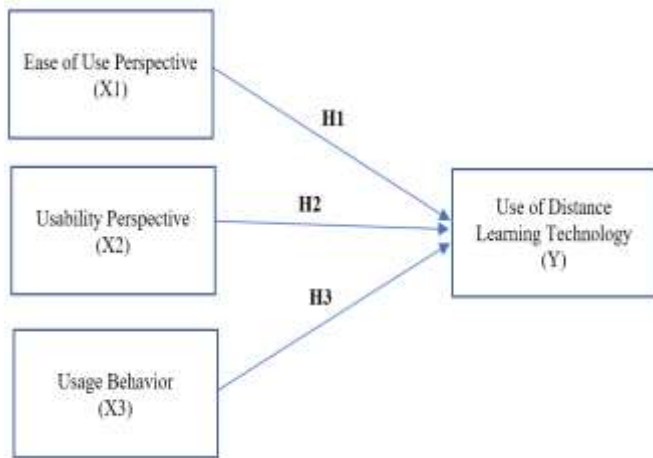
Research Model

Figure 1. The Research framework

Hypothesis Development:

The study's hypotheses are structured as below:

H1 : Ease of Use Perspective (X1) has an important impact on Use of Distance Learning Technology (Y)

H2 : Usability Perspective (X2) has an important impact on Use of Distance Learning Technology (Y)

H3 : Usage Behavior (X3) has an important impact on the Use of Distance Learning Technology (Y).

Result and Discussion

This study employs direct distribution of questionnaires to university students as a method of collecting data, through direct distribution to existing classes at the university, also lecturers who are teaching classes at the university. Respondents are selected with random selection and using the selection criteria that they are part of the academic community, namely lecturers and students so that students or lecturers are valid ones since they are aware of the perception of the use of distance learning technology.

Research Data

The questionnaires were dispersed to Universitas Internasional Batam, Universitas Putera Batam, Universitas Batam, Universitas Riau Kepulauan, and Universitas Universal. The distribution of the survey was carried out in the odd semester of 2020/2021. 128 complete questionnaires can be used out of the total number that have been collected, and 11 incomplete ones that cannot be used. 11 questionnaires in total were not used as study data since 116 questionnaires were required to achieve the desired sample size. There were 116 pieces in the questionnaires utilized in this study.

Respondent Profile

The respondents who responded to the questionnaires that were disseminated display the respondents's categories in gender. According to the profile data, 56 respondents are female, and 60 respondents are male, or 51.70 % of the total respondents. This result is representative of the academic community and is in line with how it is portrayed in the Riau Islands. The following information from the respondent's profile in this study relates to the respondent's college of origin; it is known that the respondent comes from five universities in the province of the Riau Islands that already use e-learning for learning process, with 16 respondents, or 13.80%, coming from the Universitas Batam; 47 people or 40.50% came from Universitas Internasional Batam; 23 people or 19.80% came from the Universitas Putera Batam; 10 people or 8.60% came from the Universitas Riau Kepulauan; and 20 people or 17.20% came from Universitas Universal. These findings suggest that the respondents have constituted a representative sample of the whole who attend higher education learning using e-learning in Riau Islands, a type of distance learning technology, for both teaching and learning.

Based on the data on the age category, it can be seen that the age category of the research respondents who are smaller than 20 years is 20 persons with 17.20% percentage; the age category of the research respondents who were between 20-30 years old were 87 people or 75%; and this is the biggest; the age category of respondents between 31-40 years is 6 people or 5.20%; and the age category of respondents between 41-50 years is 3 people or 2.60%. Referring to this information, it can be summarized that most of the respondents (92.20%) represent students as respondents under the age of 30 years; while those aged over 30 years represent elements of lecturers or teaching staff which amounts to 7.80% of the total respondents.

Referring to the education level data, the education level of the respondents varied from students by 105 people or 90.50%; besides that, there was 1 person who passed the S-1 or 0.90%; and 9 people who passed the master's degree or 7.80%; and others there is one person, namely 0.90% (meaning this one is an academic staff from one of the universities). This serves as evidence that the majority of the students completed the research, with the remaining respondents being lecturers or other academic personnel who were on duty at the institution (Hassoulas et al., 2023). Descriptive analysis was executed to show the research variables's overview

(Ease of Use Perspective, Usability Perspective, Usage Behavior, Use of Distance Learning Technology) used in this study (Cicha et al., 2021). The issue usage of distance learning technologies is distance learning technology usage at private universities that have e-learning sites in the Riau Islands province consisting of Universitas Batam, Universitas Internasional Batam, Universitas Putera Batam, Universitas Riau Kepulauan, and Universitas Universal.

Description of Ease of Use Perspective Variables

The Ease of Use Perspective variable is explained into 4 (four) dimensions as follows, namely "making it easy to realize what you want", "remembering how to use", "easy to use", and "increasing productivity" (Pakurár et al., 2019). These four dimensions are then each expressed in a single question. According to the data, it can be deduced that the respondents have a high impression of the "ease of use perspective" holding on to their opinions (3.90), as evidenced by the average of the respondents' responses, which falls into the high group. The indicator of "ease of use perspective" which has the highest value (4.13) according to the respondent is "easy to use", on the other hand, the indicator of "ease of use perspective"; is lowest (3.72) based on the respondent's opinion, and pointed to "Easy to Realize What Which are desired".

Description of Usability Perspective Variables

Usability Perspective Variables are explained into 4 (four) dimensions as follows, namely "increasing productivity", "having an important role", "making activities easier", and "useful for activities". These four dimensions are then each expressed in a single question. According to the data, the "Usability Perspective" has a strong perception of hanging on to the respondent's opinion (3.86), this has been shown through the respondents' responses, on average which ranges in the high category. The "Usability Perspective" indicator which has the highest value (4.05) according to the respondent is "making activities easier", on the other hand, the lowest "Usability Perspective" indicator (3.5) based on the respondent's opinion, found that it is "increasing productivity".

Description of Usage Behavior Variables

Variables of Usage Behavior are explained into 5 (five) dimensions as follows, namely "good idea", "wise idea", "fun idea", "positive idea", and "benefits are greater than disadvantages". These five dimensions are then each expressed in a single question. According to the data, "Usage Behavior" can be justified as having a strong perception of holding on to respondents' opinions (3.66), this has been shown through the average value of respondents' answers which ranges in the high

category. The "Usage Behavior" indicator which has the highest value (3.78) according to the respondent is a "positive idea", on the other hand, the lowest "Usage Behavior" indicator (3.61) according to the respondent's opinion is a "wise idea" and "The gain is greater than the loss". Variables of Distance Learning Technology Use are explained in 4 (four) dimensions as follows, namely "intend to continue to use", "hope to continue in the future", "will use often in the future", and "will recommend to others" (Kusumadewi et al., 2021). These four dimensions are then each expressed in a single question (Carroll, 2016).

The findings explain why "The Use of Distance Learning Technology" has a strong sense of holding onto the opinions of the respondents (3.58), this has been shown through the average of the respondents' answers which ranges in the high category. The indicator "Use of Distance Learning Technology" which has the highest value (3.67) according to the respondent is "Will Recommend to Others", on the other hand, the indicator "Use of Distance Learning Technology" is the lowest (3.53) in their opinion respondent is "Intend to Continue Using".

Analysis of Research Results

From statistical data, the Cronbach Alpha value is found to be 0.95, higher than the minimum Cronbach Alpha of 0.60. Thus, we can conclude that the study tool employed to assess the variable "Use of Distance Learning Technology" is reliable. The next technique, which will be followed by traditional assumption testing to ensure that the regression equation created has precise accuracy in the estimate, is not biased, and consistent, can be used based on the findings of the validity and reliability testing (Hair et al., 2021). The Normal P-plot graph and the Normality Test can both be used to determine whether the data have a normal distribution by demonstrating why they are distributed normally across the curve region. To show the normality of the research data, the data is scattered along and around the diagonal line.

Based on the results of statistical data processing, the tolerance values for variables X1 and X2 are 0.43, 0.36, and 0.37, respectively. A description of the association between the independent and dependent variables is unaffected by these three figures, which are bigger than 0.1, indicating that the correlation between each independent variable is not exceptionally strong. The heteroscedasticity test findings also demonstrate that the data are distributed and do not adhere to a certain path of pattern, hence the complete data sample can be viewed as being free of heteroscedasticity symptoms.

The significant value of X1 is 0.70 according to the outcomes from statistical analysis on Coefficient data. The first hypothesis was disproved because this value is higher than 0.05, indicating that there is no relationship between the "Ease of Use Perspective" and the "Use of Distance Learning Technology" (Y). Now that the Coefficients data have been statistically processed, it is known that X2 has a significance value of 0.11. Since this number is higher than 0.05, the second hypothesis is disproved, proving that the "Usefulness Perspective" (X2) has no bearing on the "Use of Distance Learning Technology" (Y). predicated on the outcomes of statistically analyzing the Coefficients data, the following analysis can be predicated on the knowledge that X3's significance value is 0.000. Since this value is under 0.05, the second hypothesis is supported.

The F test's significance value is 0.000, which is less than 0.05 and indicates that According to the Summary data and ANOVA data, the factors X1, X2, and X3 collectively or concurrently have an impact on Y or are significant. As a result, the criteria for determining multiple regression analysis's coefficient of determination can be satisfied. According to the coefficient of determination, or R-value, of 0.70, the variables X1, X2, and X3 have a combined effect on variable Y of 69.70%, while the remaining 30.30% is influenced by other factors outside the regression equation or is also a variable not examined in this study. The Summary Model data also provide this information.

The average value of the respondents' responses, which falls into the high category, demonstrates that the "Usability perspective" (X2) has a high sense of hanging on to the respondents' opinions (3.86). According to the respondent, "making activities easier" is the "Usability Perspective" Indicator (X2) with the highest value (4.05), while "increasing productivity" is the "Usability Perspective" Indicator (X2) with the lowest value (3.50). Respondents anticipate that remote learning technologies will simplify rather than complicate their operations. The respondents' responses, on average, which fall into the high category, demonstrate that the "Usage Behavior" (X3) has a positive perception of keeping onto respondents' opinions (3.66). According to the respondent, the "Usage Behavior" Indicator (X3) with the highest value (3.78) is a "positive idea," while the "Usage Behavior" Indicator (X3) with the lowest value (3.61) is a "wise idea" and "The gains outweigh the losses."

Academics and staff at universities have a great deal of opportunity to be morally and verbally inspired by their fellow employees, so there is a tendency for them to support the use of distance learning technologies. The average value of the respondents' responses, which falls into the high category,

demonstrates that the "use of Distance Learning Technology" (Y) has a strong feeling that responders are keeping their opinions in mind (3.58). According to the respondent, "Will Recommend to Others" is the indicator for "Use of Distance Learning Technology" (Y) which has the highest value (3.67), while "Intending to Continue Using" is the indicator that has the lowest value (3.53). This demonstrates the dedication of the academic community, particularly in upholding health protocols, as well as the propensity of the academic community and personnel to encourage others to pursue higher education via distance learning. The "Ease of Use Perspective" does not influence the "Use of Distance Learning Technology" (Y). "Usability Perspective" (X2) has no bearing on "Use of Distance Learning Technology" (Y). "Usage Behavior" (X3) has an impact on "Use of Distance Learning Technology" (Y). The variables "Use of Distance Learning Technology" (Y) is influenced by the variables "Ease of Use Perspective" (X1), "Usability Perspective" (X2), and "Usage Behavior" (X3) by a combined 69.70%, while the remaining 30.30% is influenced by the variable other than regression equation or also some variable that is not examined in this research.

Conclusion

Participants in this study were university students, faculty members, and staff who were residents of the Riau Islands for the 2020–2021 academic year. The university also maintained a webpage for online education. To respond to all of the questions posed by this questionnaire, students, professors, and staff members must have prior expertise in using distance learning technologies to deliver lectures, perform other tasks, and interact with the academic community. Profile information based on sex has already represented the community of academic and is consistent with how the academic community is represented in the Riau Islands; it is also in line with the general population [30]. A percentage of the respondents are from campuses in Riau Islands that use technology for remote learning, specifically e-learning, in the process of instructing and learning. The bulk of sample responders are lecturers and students. The respondents' educational backgrounds support the claim that the majority of students in the Riau Islands who participated in this study were lecturers or other academic staff members working on campus. The average value of the respondents' responses, which falls into the high category, demonstrates that the "Ease of Use Perspective" (X1) has a high sense of hanging on to the respondents' opinions (3.90). According to the respondent, the "Ease of Use" Perspective Indicator (X1)

with the highest value (4.13) is "easy to use," while the "Ease of Use Perspective" Indicator (X1) with the lowest value (3.72) is also "Easy to Use." This makes sense given that the majority of respondents are students and members of a youthful generation who prioritize using convenient distant learning technology in their daily lives.

Author Contributions
Conceptualization, H. S., T. W., T.; methodology, H. S.; validation, T. W and.; T. formal analysis, H. S.; investigation, T. W., and T.; resources, H. S. and. T. W; data curation, T.: writing—original draft preparation, H. S and T. W.; writing—review and editing, T.: visualization, T and H. S. All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest
The authors declare no conflict of interest.

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