

Management of Technology in the Higher Education Sector in Aceh: Adoption and Measurement during the Pandemic Covid-19

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Abstract: Technology Management is used to adapt to changing environmental conditions and technological advances and to create current transformations. Based on dynamic capability theory, this paper considers technology management as capability and measures it through the technology adoption capability maturity model to investigate the relationship between technology management practice and performance. Findings from empirical studies confirm that technology management in particular technology adoption is an important source of competitive advantage and contributes to the success of an online learning process in a positive way. The learning model presented by the lecturer in learning each material with all students uses online without any face-to-face activities. At the level of success, the lecturer felt that the learning he had done during the last few days was mostly only around 45% - 50% of the total material that had been explained. The negative impact felt by students is the ineffectiveness of online learning methods because lecturers and students cannot discuss actively and are constrained by time constraints on several online learning applications. In addition, students feel less free to ask lecturers about materials that are not understood because they are only limited by typing WhatsApp group conversations, the quota runs out, and the number of assignments given to students is the most noticeable obstacle.

Keywords: Management technology, corona virus disaster (covid-19), higher education, adoption, measurement

INTRODUCTION

The COVID-19 pandemic has had a significant impact on almost all levels and sectors of humanity, including on the architecture of development cooperation. This pandemic is not only experienced by recipient countries but also by supplying countries in development cooperation. The response to this pandemic has also raised awareness of the need to redesign the development cooperation system at the macro and micro levels. The new adaptive approach in the New Normal era includes shifting focus on policies and strategies, as well as reviewing the governance of the implementation of development cooperation in the next five years.

Coronavirus (SARS-CoV) is a respiratory infectious disease that can be transmitted through body fluids, contact between individuals, or surfaces contaminated with patient fluids (Bergeri et al., 2022)(Negara et al., 2021). The virus that was declared a national emergency pandemic in Indonesia in February 2020 has affected various sectors, especially education (USAID, 2021)(Ferrel & Ryan, 2020)(Teräs et al., 2020). Most educational institutions have stopped face-to-face learning to break the chain of spread. The Indonesian government has also issued a policy to limit the movement of activities outside the home by doing physical distancing (Rulandari, 2020)(Prodjomaroto & Muhyidin, 2021). If this step continues, in the long term it will have an impact on the development of human resources in the next human generation. So that education experts must come up with several options for solutions to overcome these problems.

The solution offered by the Minister of Education and Culture Nadiem Makarim is based on the circular letter of the Ministry of Education and Culture No.1 of 2020 concerning preventing the spread of the coronavirus to educators and educational institutions by implementing distance learning using online technology. The Ministry

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of Education and Culture has also developed several applications to support online learning that can be accessed from basic education to higher education (Churiyah et al., 2020),(Abidin & Tobibatussa'adah, 2021). This will change the habits of students and educators who initially have to come to school or campus to receive lessons to just stay at home (Nurulfa et al., 2021). However, several research results reveal that online learning still has several obstacles. Several examples were found that students had difficulty processing the knowledge that had been explained by educators because there was no direct special assistance (Syah, 2020),(Ilmi et al., 2020). Then from the educator's point of view, they only give stacked tasks with minimal learning explanations to students (Rahiem, 2021),(Churiyah & Sakdiyyah, 2020).

In terms of accommodation, online learning is quite expensive (Abidah et al., 2020). Some of these examples reveal that there is still a lack of understanding of the components of educational institutions in the application of online learning. So the purpose of this study is to provide critical analysis of the impact of the coronavirus on learning in the higher education sector, identify any changes to the current system and strategy in the online learning process on the use of technology and the ability to adopt technology in higher education lecturers and students in Aceh, as well as models. adaptive governance, which is being implemented in a distance learning scheme due to the Covid-19 pandemic. This research is expected to be a forum for exchanging opinions and ideas for policymakers, improving systems, and technology users, especially for the higher education sector affected by the Covid-19 pandemic.

LITERATURE REVIEW

The scope of technology management can be viewed as a management process. Technology planning is done to reduce the risk of complexity and uncertainty. Organizational development needs to be done to see utilization opportunities. While the creation of technology is done to be able to capture opportunities better than others. Technology assessment methods need to be developed to assess the technological progress that the organization has achieved in developing technology Theodor Levit (2018).

The purpose of implementing MOT is to create and/or add value to the company through technology, both self-created and externally acquired. Value creation/increase can be done in the form of business creation, product and service creation/improvement, or process creation/improvement Theodor Levit (2018).

There are three definitions that can be used to understand Wakefield and Stafford (2017) technology:

1. Technology is meant for accomplishing a task – all things needed to produce goods/services,
2. Technology includes the knowledge and resources that are required to achieve an objective,
3. Technology is the body of scientific and engineering knowledge that can be applied in the design of a product/process, or in the search for new knowledge.
4. It can be in the form of tools, physical manifestation, knowledge, applied science or Academic Discipline, or related and at the same time different from science.
5. Management as a Technology Can be explained as the process of integrating resources with infrastructure in a business unit for the full achievement of goals, objectives, strategies and operations.
6. Is a scientific discipline that bridges the fields of engineering and science with the field of management aimed at planning, developing, and implementing technology in order to achieve the strategic and operational goals of an organization.

The technology cycle proposed by David J. Summanth, is a whole systems approach to technology management in an organization or company. He assumes that technology decisions are not instant decisions, but are a continuous process, where there are five stages that must be passed in the process.

Technology selection is a dominant factor in business and human life. Technological progress that is growing rapidly, has given rise to the term "Technological Determinism" (Technology that regulates human life/work is determined by technology) (Mohr, 2020). In selecting technology, humans are required to become Technology Managers (not Technology Users), by selecting certain technologies and rejecting other technologies and considering the impact of technology on humans and the environment.

Effect of Technology Selection:

1. Job design
2. Productivity
3. Efficiency
4. Product quality

Technology selection and job design should be carried out simultaneously to produce a socio-technical design, where the social system and the technical system of factory operations are optimized together. The result is not only a cost-effective operating system but also considers human and social values. In addition to employment, technology selection also affects productivity (labor substitution) and quality (more uniform output).

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METHOD

Research design

The research design serves as a reference for research strategies so that researchers can obtain valid research data and tools in accordance with the characteristics and objectives of the study. In this study, the authors chose to use an exploratory research design, description.

Informant

The case study research method through an exploratory qualitative approach was carried out in order to obtain accurate data about the impact of the coronavirus on learning in the higher education sector. The sample selection indicators analyzed were based on the depth of information in the answers, not information based on point of view alone. Respondents in this study were students who represented higher education in Aceh, both public and private higher education.

Data collection technique

Collecting data using semi-structured interviews online with Google Form media. The questions used are the result of the development of literature related. Secondary data collection uses the results of data collected through the collection of scientific articles and journals. The sample selection process was carried out using the purposive sampling method. The implementation of purposive sampling it does not look at the number of samples collected but focuses on the accuracy and depth of the information generated.

The author uses in-depth interviews, documentation studies, and triangulation in the data collection process in this study, with the following explanation:

1. In-depth interview
2. Observation of passive participation
3. Literature study

Data analysis technique

Data analysis in this study refers to the qualitative data analysis model from Miles and Huberman. According to Miles and Huberman in (Sugiyono, 2019) this analysis includes three steps, namely:

1. Data reduction
2. Data presentation
3. Conclude/verification

Data Credibility Test

The data or findings in qualitative research are declared valid if there is no difference between what is reported by the researcher and what happened to the object under study. For this reason, it is necessary to test the truth value (credibility test) of the data obtained. Testing the credibility of research data is done by triangulation.

RESULT

Coronavirus (SARS-CoV) is a respiratory infectious disease that can be transmitted through body fluids, contact between individuals, or surfaces contaminated with patient fluids. The virus which was declared a national emergency pandemic in Indonesia in February 2020 has affected various sectors, especially education.

Most educational institutions have stopped face-to-face learning to break the chain of spread. The Indonesian government has also issued a policy to limit the movement of activities outside the home by doing physical distancing. If this step continues, in the long term it will have an impact on the development of human resources in the next human generation. So that education experts must come up with several options for solutions to overcome these problems.

The solution offered by the Minister of Education and Culture Nadiem Makarim is based on the circular letter of the Ministry of Education and Culture No.1 of 2020 concerning preventing the spread of the coronavirus to educators and educational institutions by implementing distance learning using online technology. The Ministry of Education and Culture has also developed several applications to support online learning that can be accessed from primary to upper secondary education levels. This will change the habits of students and educators who initially have to come to school to receive lessons to just stay at home. However, several research results reveal that online learning still has several obstacles. Several examples were found that students had difficulty in processing the knowledge that had been explained by the teacher because there was no direct special assistance. Then from the educator's side only give stacked assignments with minimal learning explanations to students. In terms of accommodation, online learning is quite expensive. Some of these examples reveal that there is still a

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lack of understanding of the components of educational institutions in the application of online learning. So the purpose of this study is to provide critical analysis of the impact of the coronavirus on learning in the primary and secondary education sector.

DISCUSSIONS

Technology Adoption

The adoption ability of each student in using learning media The selection of providers and the level of success in online learning, along with the percentage of the use of various providers as supporters of online learning during the pandemic, the following is a graph of provider selection for each online learning participant.

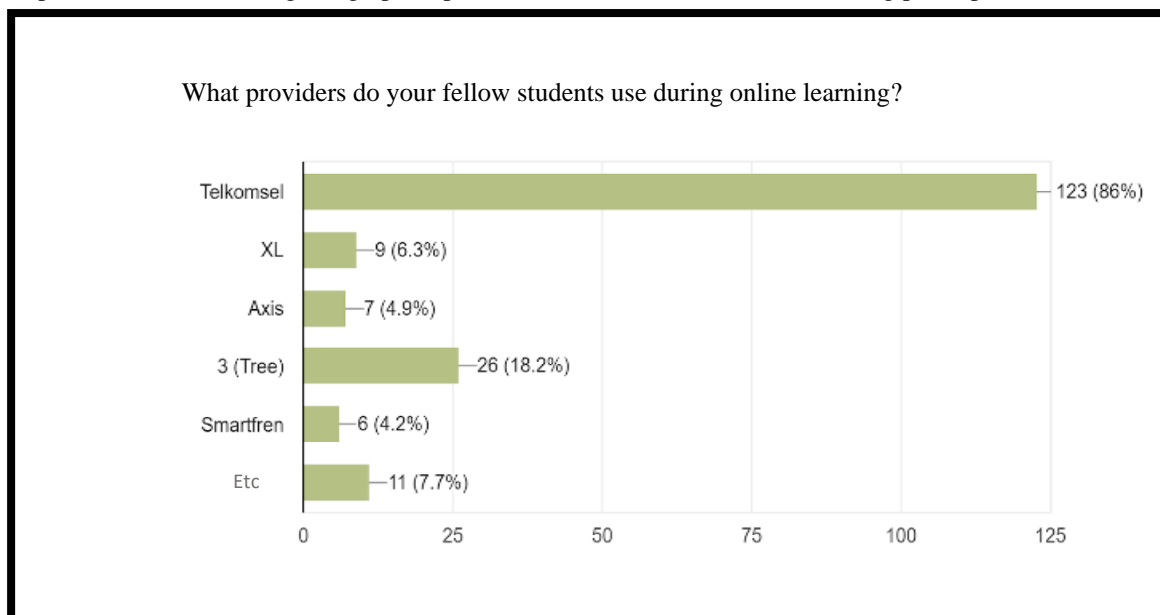


Fig 1. Percentage of Provider Usage in Supporting Online Learning

The Impact of Lecturers

This pandemic has forced lecturers to maximize their ability to operate online technology in every lesson. This can be seen in the reactions of the lecturers that most of the learning uses online applications such as WhatsApp group (WAG), Zoom Meeting, E-learning Websites, Cisco Webex, Google Classroom, Microsoft Team, Wikispaces, and also TeamViewer (figure 2).

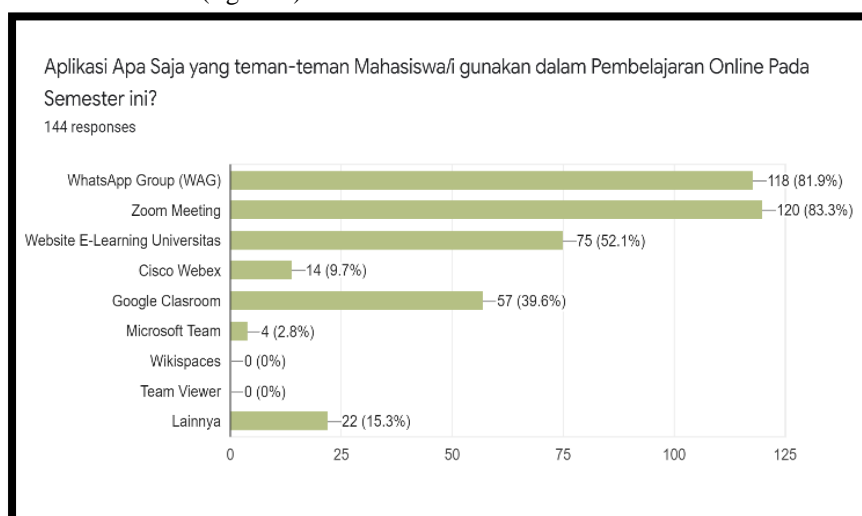


Fig 2. Graphics of Applications Used in Online Learning

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During this quarantine period for professionals whose entire activities are only in front of a monitor or laptop screen, it will not have a major impact on the work process. In contrast to professions that are required to meet face-to-face, especially lecturers/educators. Most of the obstacles felt by lecturers in online learning are the slowness to no response by students in online learning. The reasons also vary, ranging from non-existent signals, quotas, to the most interesting thing is that students do not have cell phones because they are sold for daily needs. Supposedly, after the issuance of a circular from the Ministry of Education and Culture regarding online learning, lecturers and the local government have also thought about and budgeted for all the needs of online learning.

The learning model presented by the lecturer in learning each material with students all using online without any face-to-face activities. Only a few times do the lecturers did home visits just to check on student problems and problems. Most of the lecturers only do learning through WAG where this application has several weaknesses, including: video calls are limited to a few people, cannot know student responses directly, and cannot meet face to face. This weakness is an obstacle for every lecturer in assessing the character and psychological responses of students which can be reached through face-to-face learning (direct). During the current pandemic, the competencies that have been obtained by lecturers are really being tested.

Lecturers are forced to be able to master communication and information technology in order to facilitate learning. In addition, communication between parents and educators is also very important. This is very necessary to maximize students in providing facilities such as quotas, smartphones used for learning.

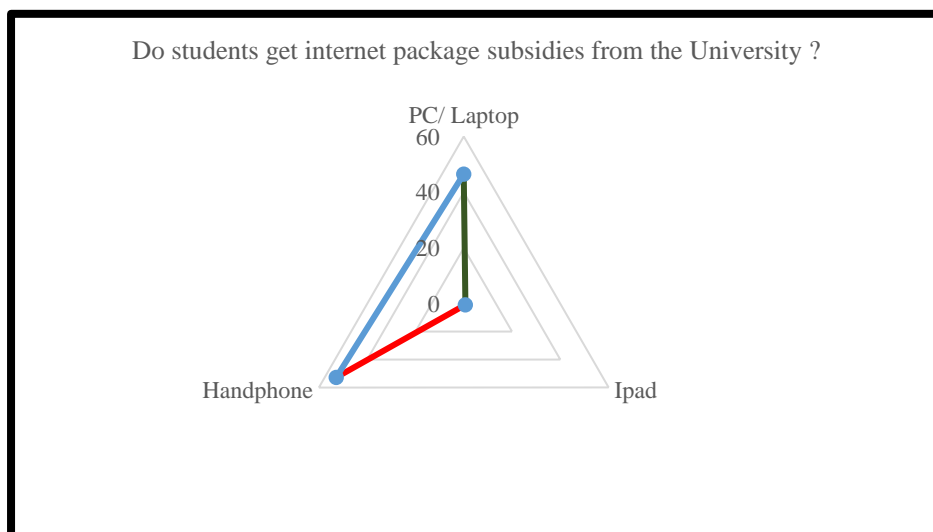


Fig 3. Types Of Electronic Devices Used By Students In Online Lectures

In terms of success rate, the lecturer feels that the learning that has been done for the past few days is mostly only around 45% - 50% of the total material that has been explained. There is only one respondent who revealed that the level of learning is high at 85%. This is because most students are accustomed to online learning, especially during daily exams, mid-semester exams, and end-semester exams.

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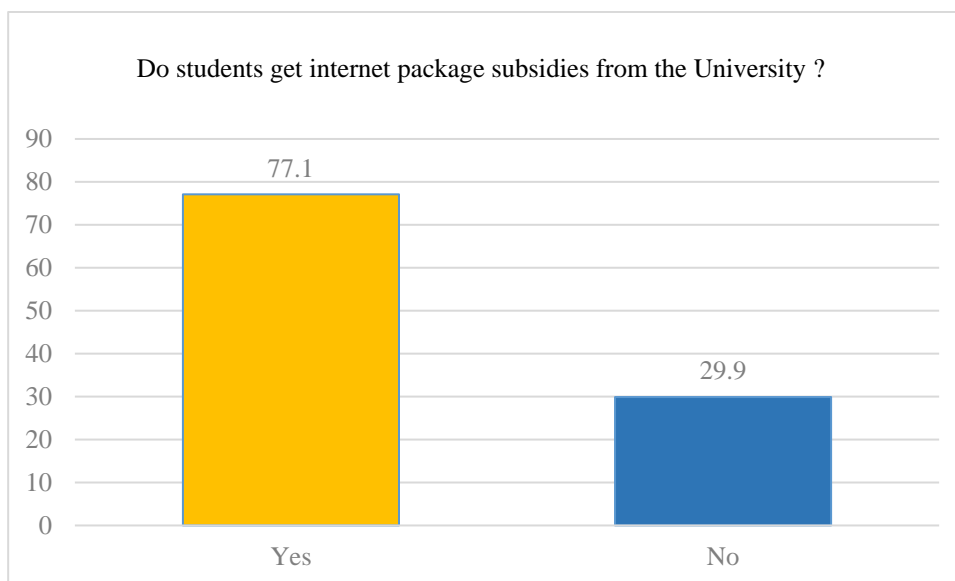


Fig 4. Graph of Internet Quota Subsidy from Universities

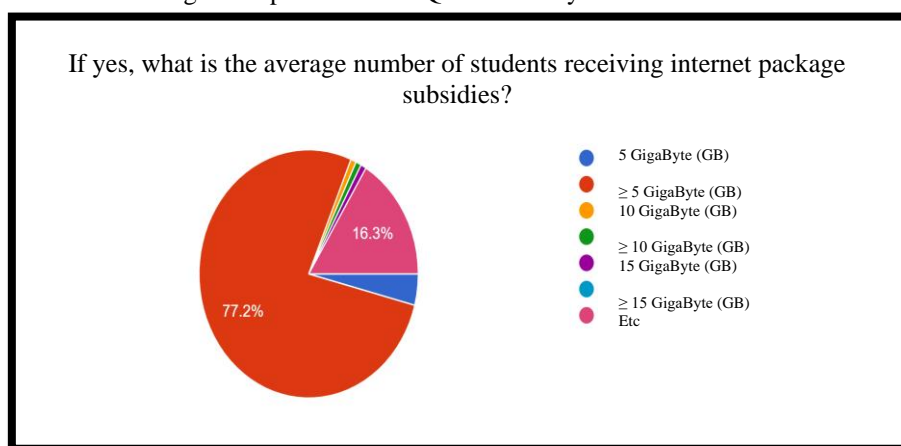


Fig 5. Graph of Average Internet Quota Subsidy

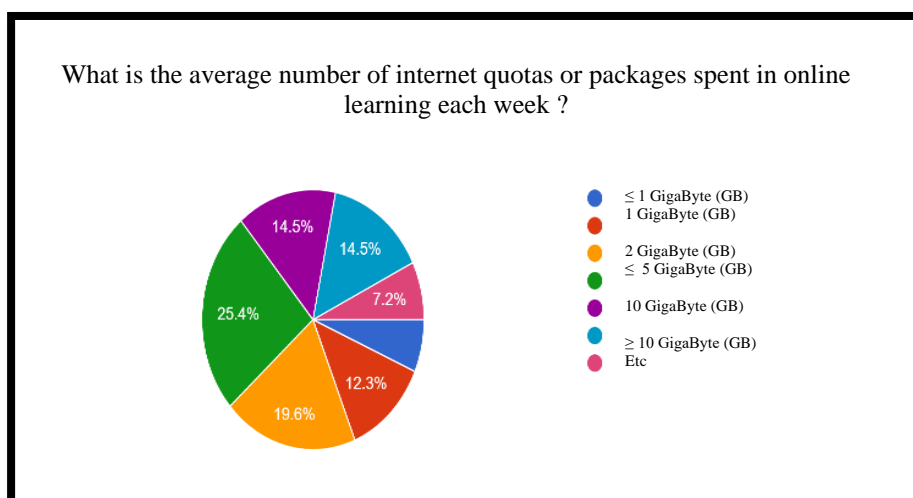


Fig 6. Average Graph in Online Learning

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Online learning should be maximized if it is paired with the synergy of appropriate learning strategies and methods (Chung et al., 2020). After experiencing online learning during this pandemic, lecturers also provide input to policymakers and other educators so they can help them maximize the knowledge transfer process to students. The inputs given include providing proportionally between face-to-face learning and online learning (which we usually know as the blended learning model) as well as taking into account the health protocols that have been regulated by the Ministry of Health of the Republic of Indonesia. This is done so that lecturers also get a definite response in the cognitive, affective, and psychomotor components that exist in students learning. The next solution is to develop learning standards that are in accordance with health protocols by policymakers. The character of students who are different in each school, as well as the ability of schools to provide learning facilities, are also some of the reasons why this solution needs to be implemented.

CONCLUSION

This pandemic is forcing lecturers at the primary to secondary education level to maximize their ability to operate online technology in every lesson. The learning model presented by the lecturer in learning each material with all students uses online without any face-to-face activities. At the level of success, the lecturer felt that the learning he had done during the last few days was mostly only around 45% - 50% of the total material that had been explained. The reason is, most students and lecturers are still not used to studying online, especially during daily exams, mid-semester exams, and end-of-semester exams.

On the student side, online learning was carried out smoothly, this was evidenced by the response of students who said that students understood the material that had been given by lecturers online during the coronavirus pandemic. However, students feel bored because they cannot meet face to face with peers and lecturers. In addition, students feel less free to ask lecturers about materials that are not understood because they are only limited by typing WhatsApp group conversations, the quota runs out, and the number of assignments given to students is the most noticeable obstacle.

Suggestions that can be made in learning during this pandemic include providing a proportion between face-to-face learning and online learning by paying attention to health protocols. The second solution is to develop learning standards following health protocols by policymakers. The character of students varies from school to school, and the ability of schools to provide learning facilities. There are also different reasons why this solution needs to be implemented.

The influence of COVID-19 in universities on the learning process can be carried out well. The media used in the learning process in the form of applications and websites are WAG (WhatsApp Group), Zoom, Google Meet, and Google Classroom, but there are positive and negative impacts felt by the academic community. The positive impact is that the implementation of the learning system at home can break the chain of transmission of the COVID-19 virus. The negative impact felt by students is the ineffectiveness of online learning methods because lecturers and students cannot discuss actively and are constrained by time constraints on several online learning applications.

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