Review of Accounting, Finance and Governance

Journal homepage: https://akuntansi.pnp.ac.id/rafgo

Measurement of E-Learning Readiness Level Case study at Accounting Department Politeknik Negeri Padang

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ARTICLE INFO

Keywords:
e-learning readiness,
e-learning system,
online learning,
pandemic

Received : 13 Nov 2021
Accepted : 26 Nov 2021
Published : 2 Jan 2022

ABSTRACT

During the pandemic, the government closed schools and colleges to avoid massive spreading of the covid-19 virus among students. E-learning has become a requirement for education institutions to support their learning activities, as well as Politeknik Negeri Padang. To be successful, the institution requires a strong strategy and adequate resources when adopting e-learning system. It is important to measure the level of e-learning readiness for avoiding the failure of e-learning implementation. In this study, we examined the level of e-learning readiness of Accounting Department lecturers of Politeknik Negeri Padang. We used six factors to measure e-learning readiness developed by Fariani (2013)and assessed the result of e-learning readiness by Aydin and Tasci index (2005). The data were obtained from questionnaires based on the factor of human resource, technology, content, financial, infrastructure, and organization using five Likert's scale. The result showed that financial factor was not ready, and needed some of work. In general, the Accounting Department teachers were ready to implement the e-learning during this pandemic, but they still need to improve in terms of people, technology, content, infrastructure and organization.

Introduction

Current technological developments have penetrated all areas of life including the education sector. One of use of technology in the education sector is e-learning system. E-learning system bring a new color in the changing of education system. However, the implementation of E-learning requires of large investment, especially in technology and human resources. However, the provison of infrastructure as technology and human resources does not guarantee the success of e-learning. Organization culture and leadership have a major influence on the success of e-learning (Akbar, 2016). In addition, there is still a view that prioritizes traditional education sytems through face to face between teachers and students. This will be a problem in e-learning implementation because they often do not apply TIK in education settings even though technology is not a problem for them (Steel, 2009).

The consequences is e-learning implementation is limited by the absence of an overall views about what should be done to be effective and resilient to alteration (Blin & Monro, 2008) Personal creativity is another challenge that may be critical to the success of Learning Management System (LMS). Personal creativity in the context of information technology is a personal attitude that reflects a tendency to experiment and adopt new information technology independently of other person communication experiences (Al-Busaidi & Al-Shihi, 2012). Chapnick (2000) warn that any agency that trying to implement e-learning must be carefully in the process of e-learning adoption. Chapnick (2000) assert that the adoption of e-learning without a thorough planning will be end in cost overruns, unattractive learning product and failure. Therefore, research of e-learning implementation readiness needs to be carried out so the result of the research can be used as a consideration for agencies

implementing e-learning. The consideration is intended so that the use of e-learning can be carefully designed so that relevant agencies can benefit from it.

The readiness to measure e-learning is known as readiness. Measurement of e-learning readiness is caried out so that organizations can know quantitatively the readiness. By knowing the level of readiness, organizations can determine what policies or strategies to be implemented (Rosenberg, 2005). E-learning readiness model not only limited to preparation before implementation but can be carried out for organization that have implemented it. In this case, organizations can evaluate wether the implementation of e-learning has been successful or need some improvement for running well. This can be seen from the re-measurement e-learning readiness index. If the index increases and reaches the expected index number so the e-learning considered success.

One of the evaluation e-learning readiness model for developing countries is the model of Aydin and Tasci (2005) which developed an ELR model capable of measuring E-learning readiness including technology factor, inovation factor, human factor and self-development factor. In addition, according to Chapnick (2000), he used eight factors to measure the level of e-learning readiness including human resource, technology, content, psycology, sociology, environment, financial, dan infrastructure. In Indonesia, one of the main reference sources in the e-learning readiness component model is research conducted by Fariani (2013). In Fariani's model (2013) she used six factors to measure e-learning readiness including human resource, technology, content, financial, infrastructure, dan organization. In determining the e-learning readiness component model which is used in his research, Fariani grouped research factors from literature and previous research. This grouping is done by taking in to account the similarity in meaning and substance of the components. This is the basis of this research which is use the model developed by Fariani as a guide.

One of university that has tried to implement e-learning in their education systems is Politeknik Negri Padang. Even though the policy for using e-learning in Politeknik Negri Padang is still not commonly used but the accounting department has started to implement it since 2019. The use of e-learning method is caused by the spada grant which was won by accounting department Politeknik Negri Padang from government. Initially, Politeknik Negri Padang used a blended learning method that combined conventional learning process (face to face) and alternately used e-learning syatem. When a pandemic occurred, the government issued instruction to work and study from home as an effort to prevent the spread of covid 19 virus. Especially the government's call to implement PSBB (large scale social restrictions) encourage every school and university to implement full offline learning system. This would affect the condition and readiness of the academic community to fully implement e-learning in a short and quite sudden time.

The implementation of e-learning requires readiness of both infrastructure and organization that oversees the e-learning system. Therefore, it is necessary to analyze e-learning system applied to the accounting department of Politeknik Negri Padang in order to determine the level of readiness of the institution. By knowing the level of readiness, the system provider can determine policies or strategies to be applied. For that reason, it is necessary to analyze the readiness of institution to develop stage in e-learning.

Literature Review

E-Learning Defeniton

E-Learning consists of two words namely "e" which stands for electronic and "learning" which means learning so that e-learning can be interpreted as a learning based on electronic equipment. Basically, e-learning is a concept or educational system that utilizes information technology in the teaching and learning process. Rusman (2012) express e-learning as a process of implementing web-based learning, computer-based learning, virtual classroom and or digital classroom. Materials in electronic learning activities are mostly delivered via the internet, intranet, video or audio, broadcasting via satellite, interactive television and CD-Room. Furthermore, Rusman explained the characteristics of e-learning as:

1. Interactivity, the availability of more communication channels either directly (synchronous) such as chatting or messenger or indirectly (asynchronous) such as forums or mailing list.
2. Independency, learning materials are independent (self-learning material).
3. Accessability, easier access of learning resources through wider distribution of internet access than convensional learning resources distribution.
4. Enrichment,learning activities, lecture materials presentation and training materials as enrichment, allows the use of information technology tools such as video streaming, simulation and animation.

E-learning *Implementation Readiness*

E-learning Implementation readiness is a physical and mental readiness of an organization to carry out, take action dan create e-learning experiences (Seakow and Samson., 2011). E-learning readiness describes how ready an organization is in several aspects to implement e-learning. Readiness is not only toward teachers and students but also readiness of the organization itself. One of the reasons why the adaptation and implementation of e-learning is necessary is the existence of obstacle or barriers in this adaptation and implementation. Spesifically stated seven main barriers in adaptation and implementation of e-learning (Mungania, 2003) :

1. Personal barrier including time management issues, language issues and attitude towards e-learning.
2. Learning style barrier include learning preferences.
3. Situational barrier including the duration of learning and distractions/interruptions in learning.

4. Organizational barrier including organization culture issues, lack of time to study, the lack of availability of online subjects.
5. Technological Barriers including learning management system quality (LMS), connectivity issues, the lack of training, navigational issues, limited technical support, data loss and inability to transfer data.
6. learning content barriers including students' expectation of lessons, relevance of lessons, content that is not specific to participants, poor quality content and poor scoring/evaluation systems.
7. Instructional barrier. Including the lack of progress reports and feedback, limited students' engagement, limited instructional design, limited reference materials, access and navigation problems, limited use of multimedia, inconsistent instructions, information overload, lack of instructor presence or poor interaction and coordination.

To measure readiness level, this research is based on components of e-learning readiness which are used as the basis for establishing the e-learning readiness model.

E-Learning Readiness Model

E-learning readiness model is based on e-learning readiness components used. Various studies and literatures have discussed this components of e-learning readiness including conducted by Chapnick (2000). Chapnick (2000)proposed ELR model by classifying e-learning readiness into eight readiness categories.

a. Psychological readiness. This factor considers individual perspectives on the influence of e-learning initiatives. This is the most important factor to be considered and has the highest chance of sabotaging implementation process.
b. Sociological readiness. This factor considers interpersonal aspects of the environment in which the program will be implemented.
c. Environmental readiness. This factor considers the operation of great power on stake holders both inside and outside the organization.
d. Human resource readiness. This factor considers availability and design of human resource support systems.
e. Financial readiness. This factor considers availability and design of human resource support systems.
f. Technological skill (aptitude) readiness. This factor considers observable and measurable technical competence.
g. Equipment readiness. This factor considers appropriate equipment ownership.
h. Content readiness. This factor considers learning content and learning objectives.

Research by Aydin and Tasci (2005) states that e-learning readiness is influenced by 4 things: people, self-development, technology and innovation. Meanwhile in Indonesia, research of e-learning readiness has begun as the implementation of learning using e-learning in several universities. In Fariani (2013) had a research at the ABC University and resulted a model based on previous reseach. Fariani classified factors that influenced the level of e-learning readiness into six groups that are: human resources, organization, technology, materials, finance and infrastructure. Fariani's research results showed that overall ABC university e-learning index is 3.07. If this figure is compared with Aydin and Tasci e-learning readiness index (2005), it can be concluded that ABC university is at the not ready level of readiness. This is because Aydin and Tasci e-learning readiness index sets a value of 3.4 as the expected level of readiness.

Seta et al., (2016)used the sama five e-learning readiness variables as Fariani (2013) that are technology, human resources, organization, financing and materials. The difference is that Seta et al., (2016) combine infrastructure variables into technology variables. In Seta's et al research, network factors, hardware and software were included into technology variables. Seta et al research at UPN Veteran Jakarta yielded at average score 3.297 which was included in the category not ready and need some of work. This means that overall UPN Jakarta is not ready yet to implement e-learning, but needs a little more effort to improve.

Theoretical Models.

In this research, the framework and e-learning readiness model used is the model developed by Fariani (2013). The reason of this model determination because Fariani's research develops its own framework by classifying research components obtained from literature and previous research. Grouping is done by taking into account the similarity in meaning and component substance. The components developed by Fariani (2013)in his research are grouped into several factors that are:

Figure 1 : Model Framework ELR Fariani (2013)

For the readiness level category in this research will use index models developed by Aydin and Tasci (2005)

those are:
- *Not ready, needs a lot of work* (Index 1 – 2,59)
- *Not Ready, needs some work* (Index 2,6 – 3,39)
- *Ready, but a needs few improvement* (Index 3,4 – 4,19)
- *Ready, go ahead* (Index 4,2 – 5)

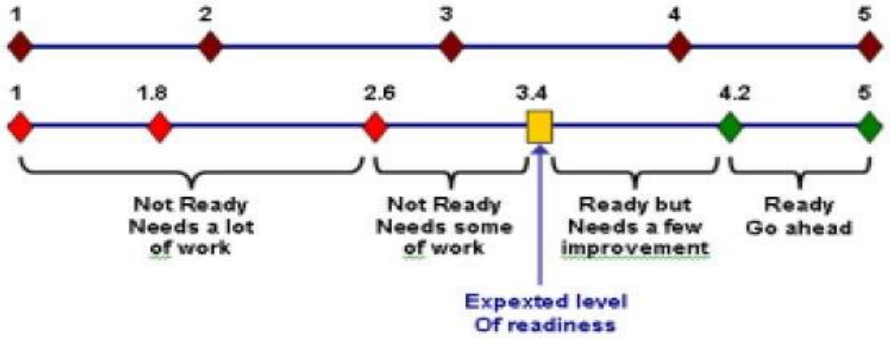

Figure 2 : Measurement Scale ELR Aydin & Tasci Model (2005)

Methods

This research aims to determine readiness level of accounting department Politeknik Negeri Padang in implementing e-learning. This research uses a quantitative approach. This research uses lecturers teaching at Accounting Departemen Poliktenik Negeri Padang for the 2019/2020 academic year as population. Research sample were obtained by using purposive sampling method with the following criteria:

a. Lecturers who teach at accounting department Politeknik Negeri Padang.
b. Have a minimum of 1 year teaching experience.

The data used in this research came from primary data,obtained from the result of distributing questionnaires, designed using the google form facility. Data collection from this questionnaire was carried out using social media and email. Questionnaires consists of two parts which are self-identity part and a part of questions related to the e-learning readiness components. Questionnaires items were developed based on factors and e-learning readiness indicator which were developed based on previous research. Furthermore, measurement use likert scale consist of 1=Strongly disagree, 2=Disagree, 3= Neutral, 4= Agree ,5=Strongly agree.

Collected data will go to the next step that is testing research instruments used, ELR index measurement components. This research tested research instrument in the form of validity and reliability test. To assess an item of questionnaires, assessment can be considered valid (reliable) if the measurement result of correlation coefficient test (r) > 0,334, whereas the instrument uses in questionnaires considered reliable if the factor has a *Cronbach' Alpha* > 0,7 (Nunally in Ghozali, 2013). After the assessment sheet is filled out by the respondents, a total score will be obtained, then the final average is calculated using the formula.

$$\bar{x} = \frac{\Sigma x}{n}$$

note :
$\overline{x}$ = Final average
$\sum x$ = Total score and
n = Respondent number

From the calculation of average score using the formula above, the average score of each research factor is obtained. This average score will be assessed for the level of readiness according to the scale of readiness measurement of the Aydin & Tasci ELR model as explained below. The assessment scale are 4 categories that are:

Table 1. Range of Values and Categories of Aydin & Tasci's ELR Model

Range of Value	Categories
l ≤ x ≤ 2,6	*Not ready, needs a lot of work*
2,6 < x ≤ 3,4	*Not ready, needs some work*
3,4 < x ≤ 4,2	*Ready, but needs a few improvement*
4,2 < x ≤ 5	*Ready, go ahead*

a. Not ready, needs a lot of work, the lowest readiness level, so more effort is needed to improve the readiness level.
b. N*ot ready, needs some work*, the readiness level that is one level below ready. At this level, university need a little more effort tio be at the ready level.

c. *Ready, but needs a few improvement*, the readiness level that can be classified as ready but still needs a little improvement. Basically, university can already develop e-learning systems but it can be disrupted if unexpected problems occurred.
d. *Ready, go ahead*, the readiness level that can be classified as ready dan should develop e-learning systems soon.

Results and Discussions

The result of validity and reliability test measurement of research questionnaire can be seen at the following table:

Table 2. Validity & Reliability Test Results

Factor	Validity test		Reability test	
	Skor	Ket.	Skor	Ket.
Human Rresources	0,850	Valid	0,94	Reliabel
Technological	0,806	Valid	0,90	Reliabel
Content	0,867	Valid	0,88	Reliabel
Financial	0,708	Valid	0,95	Reliabel
Infrastructure	0,818	Valid	0,92	Reliabel
Organization	0,733	Valid	0,90	Reliabel

According to the measurement result of validity and reliability test at research questionnaire above, it can be concluded that all question items in the questionnaire can be considered valid and the factor used in this research can be considered reliable. The Following table shows the result of data processing for each ELR component for Accounting Department Politeknik Negeri Padang.

Table 3. ELR Index for the Department of Accounting Padang State Polytechnic

Factor	**Score ELR**	**Readiness Category**
Human Rresources	4,16	Ready, but needs a little improvement
Technological	4,12	Ready, but needs a little improvement
Content	3,69	Ready, but needs a little improvement
Financial	3,31	Not Ready, but needs a little improvement
Infrastructure	3,95	Ready, but needs a little improvement
Organization	4,30	Ready, the implementation can be continued
Score ELR Institution	**3,92**	Ready, but needs a little improvement

According to the score of ELR aseesment using Aydin & Tasci scale in the table 4.1 above, accounting department Politeknik Negeri Padang has ELR score of x = 3,92. This score shows that accounting department Politeknik Negeri Padang has been in category of ready but still needs to be improve. Each component has a score between 3,4 < x s 4,2, except financial factor/variable (3.31)

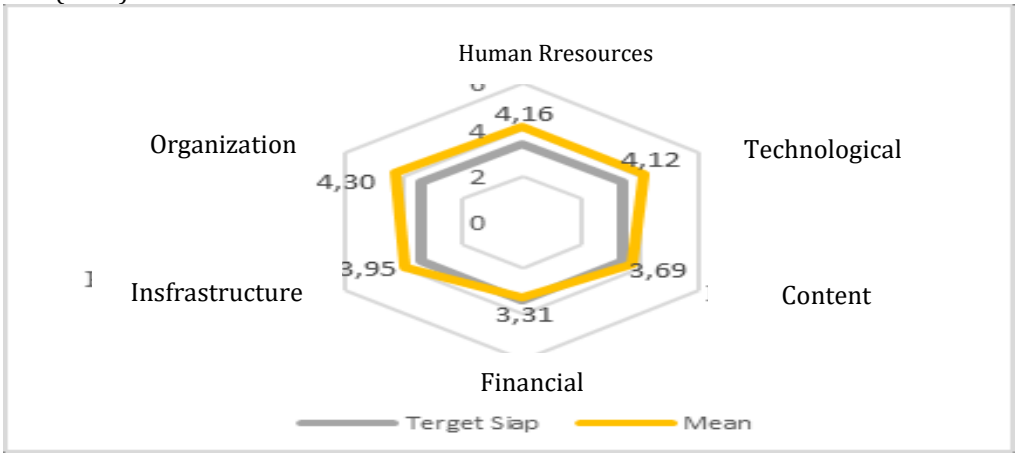

Figure 3. ELR Index for All Factors

The low score on financial factors is influenced by several conditions felt by respondents that are:

1. The lack of funding sources (budget) to develop e-learning such as procurement of hardware, software and network equipment which is very important to implement e-learning. In the implementation of e-learning, the score obtained was 3.24.

2. Not optimal in cost benefit analysis related to e-learning implementation initiatives. This reflects that accounting department did not have a proper financial planning in implementing the e-learning eventhough that cost and benefit analysis is needed.
3. Accounting department Politeknik Negeri Padang still has not maximized the functions of e-learning reserve funds eventhought the reserve funds can anticipate every problem occurs at accounting department Politeknik Negeri Padang so that the problems can be resolved quickly. This can be concluded from the score obtained which is equal to 3.05. Leaders need to allocate a budget to support the implementation of e-learning such as procurement of hardware, software and networks, fees for managing e-learning, incentives for lecturers in making teaching materials. (Meuthia, 2021)

Therefore, it is important to improve the problems above so that e-learning implementation can be continued without significant problems in implementing it. In addition, the improvement not only limited to the factors that had a score of <3.4 but also factors that still had a score of <4,2 such as human resources, technology. Contents/materials and equipment/infrastructure. In this research there is only one component that had a score of > 4,2 namely Organization component at the ELR score of 4.30, it proves that for the organization component, accounting departement has ready and can continue implementing e-learning.

Conclusions and Recommendation

According to the results of this research and explanation of e-learning implementation readiness index at Accounting Department Politeknik Negeri Padang, it can be concluded that:

a) The research model used to measure readiness index of accounting department Politeknik Negeri Padang is based on the model developed by Fariani (2013). The use of this model is based on the completeness included on the model.
b) According to the average score obtained shows that lecturer of accounting department Politeknik Negeri Padang is ready to implement e-learning. But there is also some components that need a little more improvement. The improvement can be done by paying more attention ELR factor that having score lower than 4.2. The readiness can be seen at average score obtained which is 3.92 (Higher than 3.4 as the standard score to implement e-learning)
c) 3. According to the calculation results of ERL score above, accounting department lecturer looks the most prepared for the organizational variable (ELR x = 4,30). This means that it can be concluded that lecturer of accounting depatrment have high confidence that they have an organization that very supportive in implementing e-learning. In addition, the result of the research also show that lecturer of accounting department is still unprepared for financial factor (ELR x = 3,31). This means accounting department needs to consider providing / allocating funding sources (budget) and conducting cost benefit analysis to implementation of learning using e-learning.

According to the findings and implications of the research, some suggestions can be put forward as follows:

a. In this research, researchers had limitations using one research model which is developed by Fariani. My suggestion for further research is to reassess what component will be used and try to compare theme with several other research model.
b. This research also has limitations in component measurement. There are several questions developed by the researchers themselves. For this reason, it is necessary to re-examine this matter in order to avoid the occurrence the inaccurate measurements in the component to be researched.
c. Researcher also suggest to try analyze the readiness of accounting department lecturer in the e-learning implementation using another ELR models to find out the differences in the readiness results obtained.
d. Further research is suggested to increase the number of samples in the research and further develop the scope of the object to be researched. It is also recommended to make research with the aim to compare between different agencies.

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