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E-Learning is Effectively Used for Leadership Courses at Metamedia Universities

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***Abstract*— This development research aims to develop learning media (E-Learning) in all courses at Metamedia University. E-Learning is designed to improve student learning outcomes, so students can fully understand the material provided. This study uses the Instructional Development Institute development method. IDI procedures are defining, developing, and evaluating. The type of data is primary data where the data obtained from media experts, lecturers and students. Data were analysed using Descriptive Data Analysis Techniques which describe the validity, practicality, and effectiveness of using E-Learning. The results obtained from this research and development are as follows; (1) The validity of E-Learning is stated to be very valid in terms of content and interest with a total validity value of 84.54%, while the design aspect is stated to be valid with a total value of 85.55% (2) The practicality of E-Learning is based on the lecturer's response after through validation is stated to be quite practical with a total score of 76%, while the practicality of E-learning based on student responses after going through validation is stated to be practical with a total score of 84.12% (3) The effectiveness of E-Learning is effective in improving student learning outcomes as indicated by the number of students who has passed the Minimum Completeness Criteria (87.42%). Based on the findings of this study, it was concluded that E-Learning is valid, practical and effective for use as a learning medium.**

***Keywords*— E-learning, Development Institute, Effectiveness**

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I. INTRODUCTION

Education is an important part of a country's progress (Gardner & Hoheb, 2005; Lu, Wang, & Yoon, 2019).Today, the national education system aims to ensure the global competitiveness of learners (Chen, 2024; Kithsiri dkk., 2018). Several factors determine the achievement of student learning outcomes in educational institutions. They are internal and external factors (M.-R. Kim, Kim, & Kim, 2011; Obionwu dkk., 2023; Satyanarayana, Jyothi, & Ramu, 2009). Internal factors consist of students' motivation, interests, and talents; meanwhile, external factors consist of curriculum, lecturer, learning methods, costs, facilities and infrastructure, and the environment. If these factors

are maximized, it will expedite the learning process and support optimal learning outcomes (Cheng, Chan, Cai, Zhou, & Yang, 2021; Y. Kim, Kim, & Ahn, 2010; Yang, Deng, & Wang, 2008). Learning outcomes are generally used as a measure of learning success. Learning outcomes can be measured using a series of tests or evaluations. Learning outcomes indicate the quality of educational programs obtained through the learning process.

The industrial revolution 4.0 in education has been influenced by the development of digital technology. This development raises new ideas in learning. It resulted in a paradigm shift that was originally more passive for students or teacher-centered learning (TCL) to become more active for students or student-centered learning (SCL). Students have changed from passive recipients of knowledge to positive knowledge seekers, thereby realizing fundamental educational reforms (B. Baruah, Ward, & Brereton, 2017; El-Gamal, Al-Khayyat, & El-Ewayed, 2005; Jung & Huh, 2019). In addition, the current COVID-19 pandemic leaves educational institutions with no choice but to adopt virtual learning media to promote safety and comply with social distancing protocols.

In Padang City, Metamedia University is a private university in great demand by the public. That is due to the high quality of Metamedia University compared to other institutions in Padang City. Metamedia University pays close attention to all matters, such as student and lecturer discipline, facilities and infrastructures, and syllabus achievements in all courses. Higher education has been transformed in recent times in response to major changes, including digital technology, interactive design, and delivery.

Leadership courses are mandatory courses for students Metamedia University (Bilovodska, Kravchuk, Ponomarenko, Bliumska-Danko, & Kononenko, 2024; Sanagavarapu dkk., 2020; Tkachuk, Sokol, & Glukhovtsova, 2013). This course aims to: Students are able to understand and detail and apply concepts and theories leadership in the world of work as well as being able to collaborate with his leader. This course covers the concepts of leadership, strength leaders, leadership styles, traits, leadership behavior and decision-making.

This method made the students unable to explore their potential, and the learning process became boring. Integrating the vision of the students and the teaching team allows for customization of experiences that support the students' learning processes (Cardenas, Castano, Guzman, & Alvarez, 2022). Table 1. Total of Student Metamedia University Semester Ganjil 2022/2023.

Table 1. Total of Student Metamedia University Semester Ganjil 2022/2023

No	Study Program	**Number of students**
1	Bisnis Digital	16
2	Informatika	34
3	Information System	590
Total		640

Source: Archive of Academic Office

Based on presented in Table 1, it is necessary to innovate and utilize information and communication technology in the learning process supaya semua mahasiswa yang belajar pada semester ganjil 2022/2023 bisa lulus. Technology plays an important role in everyday life, especially in learning (Ahmad & Muhmood, 2024; Krasnova & Shurygin, 2019; Makarova & Ivanova, 2021). One form of technology implementation that can be used in education is *e-learning*. The use of e-learning is expected to improve the quality of learning and push student creativity and active class participation. Besides that, with the support of e-learning, students can have an earlier opportunity to learn materials. Lecturers can also assist students in managing learning better and being involved in E-Learning (Gunasekara, Turner, & Stough, 2022).

The program for developing e-learning is a Learning Management System (LMS) Modlle. The model platform is chosen because it provides many learning resources and is flexible for use as a learning media (Tomeo, 2009; Tugashova, Bazhenov, Vikhtenko, Borodin, & Alekseeva, 2022; Wykes dkk., 2024). The management of the e-learning process, which was developed based on LMS, can be a learning media that includes various activities for lecturers and students, such as upload and download material, quiz, and exercises. It is expected to fulfill the needs of the learning process at Metamedia University.

II. RESEARCH METHOD

A. *Research Methods*

The research method used is the development research method. The type of development method chosen is the IDI (Instructional Development Institute) method. The IDI method applies development principles that are suitable for learning media development. The IDI method applies a design and development process consisting of 3 stages, needs analysis, system development and system development evaluation.

The first cycle or stage is needs analysis, namely problem identification, curriculum analysis, learning models and media used, learner characteristics, and analysis of teaching materials. The second cycle is system development, i.e. E-learning prototype design, E-learning development and E-learning validation. The third cycle is evaluation, E-learning trial, and E-learning testing through questionnaires given to teaching staff and students. The results of the questionnaire were analyzed using a Likert scale (Rahmelina, Firdian, & Maulana, 2019).

B. *Data collection instruments*

Validity

The first instrument is a validity instrument. The validity instrument was used to determine the validity of the E-learning. E-learning was validated by experts and lecturers (Ketoeva, Kiseleva, & Sysoeva, 2021; Siddhpura & Siddhpura, 2021). The validated aspects are content and design aspects of E-learning. The validity instrument uses a Likert scale. On a Likert scale, the variables will be measured and explained into variable indicators.

Practicality

The second instrument is the practicality instrument. Practicality instrument is used to determine the practicality of E-Learning. Practicality of E-Learning is tested through lecturer and student responses. Practicality instrument uses Likert scale (Maria, Oleksandr, Valentina, & Olena, 2019). On a Likert scale, the variables will be measured and explained into variable indicators.

Effectiveness

The third instrument is the effectiveness instrument. The effectiveness of E-learning is seen from the number of students who pass / learning outcomes in learning to all course at Metamedia University. Learning outcomes are obtained by giving tests to students who have been given using E-learning that has been valid and practical. The passing standard uses Minimum Mastery Criteria with a score of >70.

C. *Test Subjects*

This study uses the descriptive data analysis technique to explain the valid, practical, and effective learning level using E-learning implemented in all course at Metamedia University. Analysis of the validity level (Maulana, Firdian, & Rahmelina, 2021).

The validity analysis stages:

The validator provides answers with a choice of criteria:

- 5 = highly valid, 4 = valid, 3 = quite valid, 2 = less valid, 1 = not valid.
- Calculating validator scores on each question indicator.
- The percentage formula for analyzing validity data uses:

percentage = Score of each itemIdeal score item x 100%

$$persentage = \frac{\sum Score\ of\ each\ item}{\sum Score\ of\ ideal\ item}\ x\ 100\%$$

Table 2 explains the level of achievement and categories of validity data analysis.

Table 2. Level of acquisition of validity (Maulana dkk., 2021).

Gain Rate (%)	Group
90 – 100	highly valid
80 – 89	Valid
65 – 79	Quite Valid
55 – 64	Less Valid
0 – 54	Not valid

Analysis of the Practicality level (Omar & Mohamad, 2019).

The validity analysis stages:

The validator provides answers with a choice of criteria:

- 5 = highly valid, 4 = valid, 3 = quite valid, 2 = less valid, 1 = not valid.

- Calculating validator scores on each question indicator.
- The percentage formula of practicality data analysis is:

$$persentage = \frac{\sum Score\ of\ each\ item}{\sum Score\ of\ ideal\ item}\ x\ 100\%$$

Table 3 explains the level of achievement and categories of practicality data analysis.

Table 3. Practicality Gain Gate (Maulana & Firdian, 2019).

Gain Rate (%)	Group
90 – 100	Highly practical
80 – 89	practical
65 – 79	Quite Practical
55 – 64	Less practical
0 – 54	Not practical

Table 4 describes the level of achievement and the categories of effective data analysis.

Table 4. Effectiveness gain rate (Maulana & Firdian, 2020)

Gain Rate (%)	Group
90 – 100	Very effective
80 – 89	Effective
65 – 79	Quite Effective
55 – 64	Less Effective
0 – 54	Not Effective

The standard applied as an indicator of success in learning outcomes is Minimum Mastery Criteria, 70 (source of academic policy).

III. RESULT AND DISCUSSION

A. Result

Validity Acquisition Data

Validity acquisition data can be seen in Table 5:

Table 5. The acquisition of validity test from experts

Validation Aspect	Total Score	Validity Value (%)	Criteria
E-Learning Content	46	84.54	Valid
E-Learning Design	55	85.55	Valid
Total Score/Value Validity/Category	101	85.04	Valid

Table 5 shows the result of the learning validity test using E-learning in the all Course. E-learning content gets a validity value 84.54% and E-learning design gets a validity value 85.55% (T. D. Baruah, 2018; Grote, Hoffmann, & Reinhardt, 2008; Yeleussizkyzy, Zhiyenbayeva, Ushatikova, & Lushkov, 2023). On average, all online learning validation result using E-learning for content and design with valid values 85.04%. Learning design of all course using E-learning is declared valid as a learning media.

Practicality Acquisition Data

Practicality data based on educator responses can be seen in Table 6 as follows:

Table 6. Acquisition practicality data based on educator responses

R1 = Lecturer 1 R2 = Lecturer 2

Measurement Section	Sum			Criteria
	R1	R2	AVG	
Easy to Operate	85	90	87.5	Practical
Time Effectiveness	70	80	75	Quite Practical
Media Interpretation	70	95	82.5	Practical
Equivalence	80	80	80	Practical
Rerata	76.25	86.25	81.25	Practical

Table 6 shows the results of Practicality test data for the use of E-learning for all courses from teaching staff. The practicality of using E-learning in the aspect of "Easy to Operate E-Learning" gets practical value 87.5%. The practicality of using E-learning in the aspect of "Time Effectiveness" gets quite practical value 75%. The practicality of using E-learning for "Media Interpretation" aspect gets practical value (82.5%). Practicality of E-learning from the aspect of equivalence with a practical value (80%). The average practicality of E-learning from 4 aspects is practical (81.25%). The use of E-learning for all courses is practical to use.

Practicality Test Data Based on Students' Responses

Practicality test acquisition data from students can be seen in Table 7 as follows:

Table 7. Recap assessment from students

Measurement Section	Sum	Criteria
The simplicity of Using E-Learning	84.56	Practical
Time effectiveness of E-Learning usage	80.37	Practical
The attractivity of using E-Learning	83.33	Practical
Average	**82.75**	**Practical**

Table 7 indicates the results of the practicality test using E-learning for all course based on students' responses. The practicality of using E-learning for each aspect of simplicity, effectiveness, and attractiveness gets practical value 84.56%, 80,37%, 83.33%. The average of all learning validation results using E-learning for the three aspects gets practical value 82.75% (Ifdil I., Yohandri Y., Krismadinata K., & Rahim R., 2019; Kula, Cohen, Clempert, Grinstein-Cohen, & Slobodin, 2021). It can be concluded that using E-learning for all course is practical as the learning media based on student assessments.

Effectiveness

The result of total graduated and non-graduated students can be seen in table 7:

Table 7. The Effectiveness Result

No	Study Program	Graduated	Non Graduated
1	Bisnis Digital	90%	10%
2	Informatika	89.88%	10.12%
3	Sistem Informasi	82.40%	17.60%

Source: Archive of Academic Office

Table 7 data on students who passed and did not pass all courses at Metamedia University using E-Learning. The number of students who pass the digital business study program is 90% and 10% who fail. The number of students who passed the informatics study program was 89.88% and those who did not graduated were 10.12%. The number of students who graduated in the information systems study program was 82.40% and those who did not graduated were 17.60%. After combining the number of students who have graduated in each study program, the percentage that has passed is 87.42% (effective) (Kakehi, Takahashi, Watanabe, & Yamada, 2005). The use of E-learning in all courses at Metamedia University is effective.

B. Discussion

Validity test results discussion

Validity is the accuracy in performing the measurement function (Abuhmaid, 2020). The aspects of E-learning that are measured for validity are content aspects and design aspects. Before measuring the validity of the content aspects and design aspects, an indicator validation is carried out on each statement used. The results of the questionnaire validation from experts for each question item on the content aspect were declared valid by getting a score of (85%). Based on the results of the expert's assessment, the validation questionnaire for the content aspect is valid to use. The results of the questionnaire validation from experts for each question item on the design aspect were declared very valid by getting a score of (90%). Based on the results of the expert's assessment, the validation questionnaire for the content aspect is very valid to use. Based on the results above, it can be concluded that the questionnaire to measure the validity of E-learning from the aspects of content and design is very appropriate to be used by respondents.

The questionnaire instrument that has been valid from the content aspect is then given to the E-learning expert for assessment. The questionnaire instrument for this aspect is divided into 2 parts, namely the E-learning content and interest in using E-learning (Grigg & Wheeler, 2003; Maqbool, Asif, Imran, Bibi, & Almusharraf, 2024; Shurygin & Krasnova, 2016). The number of statements assessed by the expert amounted to 11 statements. From the content part, the expert assessed that the E-learning developed refers to the curriculum, teaching materials in accordance with the curriculum, clear learning objectives, supports understanding of concepts, uses simple sentences and is easy to understand. In the interest group, experts assessed the characteristics and increased student interest in learning using E-learning.

Based on the assessment that has been done by the expert, from the content aspect, it gets a valid score (84.44%). This means that the E-

learning developed has referred to the curriculum, teaching materials are in accordance with the curriculum, learning objectives are clear, have supported understanding of concepts, use simple sentences and are easy to understand. Based on the assessment that has been done by the expert, from the interest aspect, it gets a very valid score (90%). This means that the development of E-learning is very suitable for the characteristics of students and greatly increases student interest in learning. The average value of the validity of E-learning learning media from the content and interest aspects is valid with a value of (85.45%).

Based on the assessment conducted by experts, the display aspect received a valid score (84.54%). This means that the menu, instructions, colours, buttons and icons of the developed E-learning are simple and easily understood by students. Based on the assessment that has been done by experts, from the language aspect it gets a very valid score (85.55%). This means that the development of E-learning is simple and very easy to understand and in accordance with good and correct language rules. The average value of the validity of E-learning learning media from the display and language aspects is valid with a value of (85.04%).

Discussion of practicality test results

Practicality is related to the application of E-learning media during the learning and teaching process. The application of E-learning learning media is equipped with clear instructions that make it easier for lecturers and students to use it. The level of practicality of E-learning learning media is assessed by lecturers and students who take Leadership courses. The first step in assessing the practicality level of E-learning is to validate the practicality questionnaire for each statement item to the E-learning expert (Alemdar & Docal, 2011; Deshogues & Gilliéron, 2010). This activity is carried out to determine the validity level of each statement item that will be asked to lecturers and students who have taken the course.

The results of the validity assessment of the practicality questionnaire for each statement item conducted by E-Learning experts are valid (85%). Based on the results of the expert's assessment, the practicality questionnaire is valid and appropriate for use. After the practicality questionnaire is declared valid for use, the next step is to give the practicality questionnaire to lecturers and students who take the course. The process of filling out the practicality questionnaire to lecturers and students is done online using google form. The content of the practicality questionnaire is divided into 4 parts, the first is the ease of using E-learning, the second is the effectiveness of time to use E-learning, the third is the interpretation of E-learning and the last is the Equivalence of E-Learning.

The results of filling out the practicality questionnaire conducted by lecturers who teach courses for aspects of ease of using E-learning are practical (87.5%). In the aspect of time effectiveness, it is quite practical (75%). Based on the above results, it can be concluded that E-learning applied to courses is easy/practical to use. As for the time effectiveness aspect, it is quite practical to use. This is because the lecturer must manage the time for the implementation of theoretical lectures and practicum. The results of the assessment from lecturers on the practicality of using E-learning for the interpretation section received a practical score (82.50%). Based on the results of the assessment, it means that the developed E-learning is easy to understand the operation by lecturers.

Discussion of effectiveness test results

The effectiveness of using E-learning is seen from the ability of students to be actively involved in the learning process and make it easier to understand the learning material provided. The effectiveness of using E-learning in Leadership courses can be applied if the E-learning used is valid and practical. Based on the results of tests that have been carried out by experts, lecturers and students, E-learning is declared valid and practical to use as a learning medium at Metamedia University. The effectiveness of using E-learning can be seen from the results of student learning at the end of the semester.

IV. CONCLUSIONS

After conducting research and analysis of the application of E-learning to the learning outcomes of 2022/2023 odd semester students at Metamedia University. Several conclusions were found:

1. The resulting learning media is E-learning. E-learning contains the arrangement of course material, availability of assignment menus, attendance lists, chat, discussion forums,

glossaries, lessons, quizzes, surveys, URLs, wikis and workshops.

2. The results obtained from this research and development are as follows; (1) The validity of E-Learning is stated to be very valid in terms of content and interest with a total validity score of 84.54%, while the design aspect is stated to be valid with a total score of 85.55% (2) Practicality of E-Learning based on lecturer responses after going through validation it was stated to be quite practical with a total score of 76%, while the practicality of E-learning based on student responses after going through validation was stated to be practical with a total score of 84.12% (3) The effectiveness of E-Learning was effective in increasing student learning outcomes which was marked by the large number of students who passed was 87.42%.

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