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E-Learning Evaluation Based on Context, Input, Process, and Product (CIPP)

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Abstract: The development of internet-based information technology has had an impact on many aspects of human life, including education. Online learning is made possible by the learning paradigm in the industrial era 4.0. During the COVID-19 pandemic, many universities implemented online learning methods using E-Learning, in line with government recommendations to implement health protocols to break the chain of the COVID-19 virus, such as wearing masks, washing hands and maintaining distance. The Faculty of Engineering, Batam University has used e-learning for learning during the pandemic and continues after the pandemic, but its implementation has never been evaluated. The aim of this research is to assess the context, input, process and product (CIPP) of e-learning at the Faculty of Engineering, Batam University. This research uses a quantitative and qualitative approach (mixed research) by distributing questionnaires to lecturers and students of study programs within the Faculty of Engineering, Batam University. Based on research conducted by evaluating E-Learning from the context aspect, both lecturers and students gave very good responses so it needs to be maintained. Furthermore, from the input aspect it provides a very good response, therefore it needs to be maintained and improved. The response from lecturers for the process aspect is in the very good category, while the response from students is in the good category, so the process element needs to be improved. Assessment of the product aspect shows that E-Learning at the Faculty of Engineering, Batam University must be improved.

Keywords: Context; E-learning; Evaluation; Input; Process; Product

Introduction

The development of internet-based information technology has had an impact on many aspects of human life, including education (Li, 2021; Lily & Alhazmi, 2020). Online learning, made possible by the learning paradigm in the industrial era 4.0, is increasingly being implemented after the COVID-19 pandemic in an effort to help students in their academic endeavors (Djamdjuri & Kamilah, 2020; Nabung et al., 2022). The Covid-19 pandemic that has occurred has had a major impact on human life in various aspects, both in terms of aspects (Amin et al., 2002). The rise of advances in information and communication technology has changed the direction and media used in the learning process, ushering in an industrial revolution fourth in the field of education (Paizar, 2021). So that the quality of the graduates produced is able to compete in the difficult digital era, technology plays an important role in the learning process to meet the demands of lecturers and students in achieving learning goals. E-Learning is one of the internet-based information technologies that is most widely used in the field of education and online learning (Alfiyandri et al., 2020; Martinez-Garcia et al., 2023). One of the results of aligning the educational landscape with the growth of information technology is the implementation of e-learning, which has the

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advantage of bringing teachers and students together during the educational process. Students will certainly benefit from using e-learning to absorb lectures in an interactive, productive, constructive, effective and efficient manner. E-learning is online or virtual learning that involves technology (Alfiyandri et al., 2023; Dewi, 2022). Apart from that, students are also expected to have 21st century skills. 21st century skills include knowledge of learning, innovation, and information, media and technology (Trilling & Fadel, 2009). E-learning can have an impact on students' digital literacy skills (Dewi, 2022; Hamutoğlu & Sezen-gültekin, 2019). The use of E-Learning actually also provides opportunities for lecturers and students to develop their competencies, especially pedagogical and professional competencies, so that the use of E-Learning can be a solution to overcome the learning process so that learning becomes effective and efficient and can be done anywhere and at any time.

Before the Covid-19 pandemic, the Faculty of Engineering, Batam University began offering online education through e-learning, which then became the main teaching method during the pandemic and continues after the pandemic. Research on the use of e-learning shows that it increases the effectiveness of the learning process, according to a number of studies. Learning can now be done anywhere and without the need to take place in a physical classroom thanks to e-learning, which has replaced traditional approaches with new, digitally integrated ideas (Prestiadi, 2020). In E-Learning, lecturers not only upload lecture material that students can access, but lecturers also evaluate lectures, communicate, collaborate, and manage other aspects of lectures (Friadi et al., 2022). The learning process with E-Learning in its implementation certainly still has obstacles and shortcomings here and there, but since it has been used until now, the Faculty of Engineering, Batam University has never carried out monitoring and evaluation of the use of E-Learning so researchers are interested in seeing the extent of the use of E-Learning (Friadi et al., 2020) viewed from the Context, Input, Process and Product (CIPP) side.

Initial results of interviews with lecturers and students at the Faculty of Engineering, Batam University show that there are still obstacles in using e-learning. These obstacles include the need for longer lecture preparation time compared to lectures in traditional classes, barriers to access to e-learning for some lecturers, and a lack of ability to master information technology, which means all lecturers are unable to use e-learning. On the student side, it is known that the level of student access to E-Learning is still low with limited internet data quotas and WiFi access facilities. Another problem arises because there are still many students who are lazy about accessing and downloading lecture materials, preferring to wait for their friends, and there is a lack of interest and desire among students to take part in online learning.

There are still gaps in the implementation and process of e-learning at the Faculty of Engineering, Batam University which is not felt to be appropriate for lecturers and students. Lecturers have not made full use of the available content; instead, they only use downloaded materials, content related to document presentations, and email-based learning strategies. Discussion facilities and interactive content creation have not been utilized properly. The gap in research findings regarding online learning assessment shows that students' situations also require a learning approach. It is important for lecturers to incorporate online learning into efficient learning techniques when implementing it. According to a number of studies, educators' technical teaching methods and styles are not suited to the online learning environment and have not been fully integrated with technology (Coman et al., 2020). It is important to assess the overall content and application of E-Learning as there are several implementation and technical issues with the use of the content that prevent students from practicing and learning successfully.

Researchers used the context, input, process and product (CIPP) evaluation model to assess E-Learning learning at the Faculty of Engineering, Batam University. The purpose of the CIPP model is to improve rather than prove, and the CIPP evaluation model is considered acceptable and comprehensive for evaluating educational programs. Researchers chose the CIPP assessment model because it uses a holistic evaluation approach and aims to present a very complete and comprehensive picture of a project, from the setup stage to the implementation stage. In addition, the CIPP evaluation approach has the capacity to conduct formative and summative evaluations. Therefore, this serves to provide final data and help program improvements (Arikunto, 2014). The results of this research are believed to be able to help the Faculty of Engineering, Batam University implement e-learning as well as possible in the future.

This E-Learning evaluation needs to be discussed to resolve the main problems of use, innovation, E-Learning initiatives and policies, especially regarding quality and content. The solution provided is to add content in the form of indicators of online teaching skills such as starting classes, teaching variations, and ending learning sessions. The advantage of the proposed solution is that it links content with clear teaching methods and involves designing ideal teaching aspects to make them more meaningful.

Method

This research uses the CIPP (Context, Input, Process, and Product) method created by Stufflebeam et al. (2017) as the basis for its evaluation. A sequential explanatory design, mixed strategies, was used in this study. There are two processes, the first involves conducting a quantitative survey. Apply the CIPP model that includes context, input, process, and product. After that, the results are compared and analyzed in the second qualitative step. Questionnaires are used as instruments in quantitative research.

The CIPP model, as depicted in Figure 1, is a comprehensive and extensive evaluation approach that concentrates on four main areas of a program. CIPP-based e-Learning is being evaluated at the Faculty of Engineering, Batam University, using quantitative and qualitative methods (mixed methods) (Sugiyono, 2015).

Figure 1. CIPP model components (Stufflebeam & Zhang, 2017)

Primary and secondary data were used in this investigation. The results of filling out respondent questionnaires by lecturers and students are primary data that researchers collected directly from the source. Secondary data is facts found that already exist at Batam University. The population in this study were E-Learning users at the Faculty of Engineering, Batam University, consisting of lecturers and students. The sampling technique in this research is to use a Non-Probability Sampling technique, Accidental Sampling type, namely a sampling technique that does not provide an equal opportunity for each element or member of the population to be selected as a sample. Rivanti et al. (2021) with a sample size as many as 19 lecturers and 135 students.

In this research, questionnaires, interviews and observations were used to collect data. To collect related data, a questionnaire including selected questions on a Likert scale was distributed to respondents using E-Learning. Interviews are a type of direct data collection that asks about relevant sources. Observation is the process of collecting information for research through sensing and making reports based on what is observed, heard and felt. According to the definition of qualitative research, data analysis is an effort carried out by processing data, organizing data, dividing it into manageable units, looking for and identifying patterns, determining what is important and what to learn, and deciding what can be given for others. Assessment information is contained in questionnaire data.

Data from the questionnaire was assessed based on a Likert scale, namely with the criteria of Strongly Agree (SS), Agree (S), Neutral (N), Disagree (KS), and Strongly Disagree (STS). Therefore, depending on how lecturers and students show their interest in adopting E-Learning, the value of each is different. To find out the percentage of lecturers' and students' attention to the implementation of E-Learning based (CIPP) which is expressed using the Total Respondent Achievement (TCR) formula.

Result and Discussion

Results

Context Evaluation of Lecturer Responses

Table 1 presents indicators for assessing the E-Learning learning context with lecturer respondents. The average percentage value of context evaluation with lecturer respondents is 82.69% in the very good category.

Table 1. Evaluation Aspects Context Description of Lecturer Respondent Data

Indicator	(%)	Category
The purpose of implementing e-learning	79.30	Good
Setting the environment for implementing e-learning	84.21	Very good
Requirements for implementing e-learning	84.56	Very good

Evaluation of Student Response Context

Table 2 contains indicators for assessing the E-Learning learning context with student respondents.

Table 2. Evaluation Aspects Context Description of Student Respondent Data

Indicator	Percentage (%)	Category
The purpose of implementing e-learning	3.23	Good
Setting the environment for implementing e-learning	4.69	Very good
Requirements for implementing e-learning	6.17	Very good

The average percentage value of context evaluation with student respondents was 81.36% in the very good category.

Evaluation of Lecturer Response Input

Table 3 is the percentage of evaluation of e-learning learning input at the Faculty of Engineering, Batam University. The average percentage value of input evaluation with lecturer respondents was 86.84% in the Very Good category.

Table 3. Evaluation Aspects of Input Data Description of Lecturer Respondents

Indicator	Percentage (%)	Category
Teaching lecturer	84.91	Very good
Student	88.77	Very good

Evaluation of Student Response Input

Table 4 shows the percentage of evaluation of E-Learning learning input at the Faculty of Engineering, Batam University. The average percentage value of input evaluation with student respondents was 87.75% in the very good category.

Table 4. Input Evaluation Aspects Description of Student Respondent Data

Indicator	Percentage (%)	Category
Teaching lecturer	86.12	Very good
Student	89.38	Very good

Evaluation of Lecturer Response Process

The evaluation indicators for the E-Learning learning process with lecturer respondents are presented in Table 5. The average percentage value of the evaluation process with student respondents was 80.74% in the very good category.

Table 5. Process Evaluation Aspects Description of Lecturer Respondent Data

Indicator	Percentage (%)	Category
E-Learning Implementation	86.66	Very good
Utilization of E learning courses for teaching and learning activities	84.91	Very good
Utilization of infrastructure and facilities	80.52	Very good
Barriers to implementing E-Learning	70.87	Good

Evaluation of Student Response Process

Indicators for evaluating the E-Learning learning process with student respondents are presented in Table 6. The average percentage value of the evaluation process with student respondents was 78.66% in the good category.

Table 6. Process Evaluation Aspects Description of Student Respondent Data

Indicator	Percentage (%)	Category
E-Learning Implementation	81.83	Very good
Utilization of E learning courses for teaching and learning activities	83.63	Very good
Barriers to implementing E-Learning	68.79	Good

Product Evaluation Lecturer Response

Table 7 shows the percentage of E-Learning product assessments at the Faculty of Engineering, Batam University. The average percentage value of product evaluation by lecturer respondents is 77.87% in the good category.

Table 7. Description of Data on Product Evaluation Aspects of Lecturer Respondents

Indicator	Percentage (%)	Category
Results of achievements in implementing E-Learning courses	76.14	Good
Impact of implementing E-Learning courses	79.47	Good

Evaluation of Student Product Responses

Table 8 below shows the percentage of E-Learning product assessments at the Faculty of Engineering, Batam University. The average percentage value of product evaluation by student respondents was 76.48% in the good category.

Table 8. Product Evaluation Aspects Description of Student Respondent Data

Indicator	(%)	Category
Results of achievements in implementing E-Learning courses	75.45	Good
Impact of implementing E-Learning courses	77.51	Good

Based on Figure 2, it can be seen that from the Context, Input, Process, Products (CIPP) variables, the results obtained for Contexts have an average of 80.74, for Input the average is 78.66, then for process the average is 77.87, and product times 76.48.

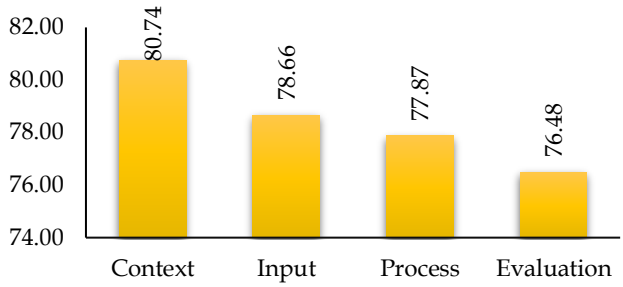

Figure 2. Result CIPP evaluation of e-learning in engineering faculty of UNIBA

Discussion

The use of E-Learning in the learning process which is adapted to the characteristics of digital native students proves that Batam University is one of the universities in Indonesia that incorporates technology into its curriculum. Lecturers are expected to master a series of skills and be equipped with various digital competencies and the ability to utilize new technology, which is a challenge for some lecturers (Alexander et al., 2017). Utilizing E-Learning is also an option to improve the quality of education in each study program at Batam University as a support for learning. Likewise in the Faculty of Engineering, but the implementation of E-Learning in the Faculty of Engineering has never been evaluated because it has only been implemented in the last two years.

E-Learning improves students' understanding and practice in subject matter while giving them great freedom in the learning environment (Guo et al., 2020; Permata et al., 2023). The digital era encourages students and lecturers to put more effort into carrying out their respective duties so they can become part of the digital world (Gonzalez-Sanmamed et al., 2020; Marsevani, 2022). In this research, researchers conducted an evaluation of E-Learning at the UNIBA Faculty of Engineering with the aim of measuring the success of using E-Learning, comparing the reality of what happened with the planning and program expectations contained in the implementation of E-Learning-based lectures and producing conclusions and recommendations for the program. The findings of this research show that although the use of E-Learning is relatively effective (Aman et al., 2021; Damayanti et al., 2022; Irawan & Prasetyo, 2020; Satyawati et al., 2022). Several implementation issues still need to be resolved. These problems have been mentioned in the points above.

Based on the research results, it was found that the CIPP model has advantages, one of which is that it is more comprehensive or complete in obtaining information because the object of evaluation is not only results but also includes context, input, process this is in accordance with research. The CIPP model also has weaknesses, including: evaluators are not sensitive to related questions or problems, because they only focus on information that is important for decision makers and their staff (Oktapiani et al., 2022). The assessment results are focused on senior management coordinators, so this model is considered unfair and undemocratic; and the CIPP model is complex and requires a lot of money, time, and other resources. The use of the CIPP assessment model is that its application in the classroom needs to be tweaked or changed in order to achieve maximum achievement.

The results of this research conclude that program evaluation using CIPP was carried out to improve the quality of the learning process in the classroom. The evaluation study also concluded that the research has produced benefits that can be implemented in institutions as is also found in this research because the results of the evaluation research are intended to be used as material for consideration in decision making. Especially if using an appropriate assessment research approach, such as CIPP.

Conclusion

The implementation of E-Learning at the Faculty of Engineering, Batam University has gone well, although there are still several things that are not optimal. The form of recommendation resulting from the findings of this research is to the leadership of Batam University, especially IT managers and campus communities who use E-Learning to maximize the availability of E-Learning facilities and infrastructure, and the university prepares strict regulations for quality monitoring in the learning process which is likely to occurs in online learning. Furthermore, students are able to increase their personal capacity as dignified learning beings. Finally, for lecturers to improve the competence of professional educators, especially in mastering teaching using information technology, especially based on E-Learning. The average product component value which has the lowest value is 76.48, recommended for improving the implementation of online learning and ideal E-Learning content. The implementation of E-Learning can be continued with improvements because parts that are less than ideal are found but can still be improved in each indicator element.

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Conflicts of Interest

The authors declare no conflict of interest.

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