

Distance Learning Evaluation of Material Science With The CIPP Model

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Article Info	Abstract
<p>Article History</p> <p>Received: May 14, 2021</p> <p>Accepted: August 29, 2021</p> <hr/> <p>Keywords : Distance Learning, Material, Science Evaluation, CIPP</p> <p>DOI: 10.5281/zenodo.5326946</p>	<p><i>The Merchant Marine Polytechnic (known as PIP/PoliteknikIlmuPelayaran) Semarang is a boarding school recently implementing distance learning of Material Science for the first time. As a ship's crew, each seafarer is required to have the Certificate of Competency (Co.C) and Certificate of Proficiency (Co.P). This research aims at analyzing the implementation of distance learning at the Merchant Marine Polytechnic (PIP) Semarang based on understanding and management of lecturers and instructors in their fields of expertise. The population was 86 lecturers. The data was collected using questionnaire previously tested based on its validity and reliability and then descriptively and qualitatively analyzed. The research results showed the context evaluation of 81.40%, input evaluation of 72.09%, process evaluation of 95.35%, and product evaluation of 83.72%. Due to the implementation of distance learning at the Merchant Marine Polytechnic (PIP) Semarang, the results of CIPP evaluation classified into good category in all aspects. The distance learning process evaluation was the most dominant result. It means that the distance learning process evaluation was greatly successful as expected by the PIP Semarang.</i></p>

Introduction

The Merchant Marine Polytechnic (PIP) Semarang is one higher education institution educating and training cadets in the field of shipping and port to become the Officers Class I and Shipping/Port experts to meet the needs of the national and international navy fleets. To realize the learning objectives, the cadets of Merchant Marine Polytechnic (PIP) Semarang are greatly required to master the shipping competencies. The recent development of knowledge and technology has significantly changed various fields including education. The information technology in education may be used to facilitate the teaching-learning processes. The use of information technology in teaching-learning processes has become one important element in supporting more qualified education. The information technology-based learning has met the demands of millennial generations and 4.0 era.

In a normal condition, the learning activities commonly include the observation, questioning, data collection, associating, and communication stages. Meanwhile, the methods used usually cover discussions, practicums, and observations. Giving rewards, like having earlier lunch for those quickly and accurately completing the tasks than the other groups as well as giving light sanctions, like cleaning the practicum room, classroom, or the surrounding environment for those frequently make mistakes or less-active during the class activities are actually made to motivate the class participants.

On 3 March 2020, the Merchant Marine Polytechnic (PIP) Semarang issued a policy for all cadets to implement the distance learning leaving their conventional learning and dormitory life activities. Staffs and lecturers/instructors were recommended to work from home to prevent from the spread of pandemic. This new phenomenon happened for the first time that distance learning was inevitable and should be implemented with limited preparations and conditions. The government has made various efforts to fight against the corona virus pandemic by issuing various policies in all sectors including education. One of those policies is social distancing. This policy requires cadets to study at home for indefinite period of time as recommended by the government. This uncertain condition requires the lecturers to use internet-based technology for distance teaching-learning activities.

The Information technology-based learning has greatly influenced the education transformation processes from the conventional to digital learning in both content and system. In the educational world, the utilization of information technology has its own advantages both from the learning effectiveness and flexibility. Effectiveness deals with the easiness in understanding various sources to possibly learn individually, while flexibility deals with the unlimited space and time that learning is possibly accessible wherever and whenever.

Online learning is a learning activity utilizing the internet technology. In online learning, the lecturers do not only upload the learning materials to be accessed by the cadets, but also evaluate, communicate, collaborate, and manage the learning processes considering the other learning aspects. Learning materials are not merely taken from books or materials which are then changed into web pages, but the lecturers should also pay more attentions to the instructional and design aspects to make those materials more attractive.

The lecturers, especially those teaching the theoretical courses have admitted that the implementation of distance learning at the Merchant Marine Polytechnic (PIP) Semarang has already utilized the internet networks, yet still limited as the source of information only. Not all lecturers and instructors have the ability to provide various learning materials through internet, cyber interactive forums, or online tests.

The Merchant Marine Polytechnic (PIP) Semarang has issued a policy for all cadets to have distance learning and leave their conventional learning and dormitory life activities. Staffs and lecturers were recommended to work from home and still be productive and run the learning processes well through the internet-based technology. This phenomenon happened for the first time that distance learning should inevitably be performed with limited preparations and conditions.

Thus, this research is conducted to evaluate the implementation of distance learning at Merchant Marine Polytechnic (PIP) Semarang. The implementation of distance learning included: (1) distance learning management implemented by the lecturers and instructors, (2) cadets' understanding in distance learning activities (3) the availability of supporting facilities and infrastructures, and (4) problems faced by Merchant Marine Polytechnic (PIP) Semarang in implementing the distance learning activities.

Distance learning was first introduced by the Illinois University in Urbana Champaign by utilizing the Computer-Assisted Instruction (CAI) and the first computer was named Plato (Nicholson, 2007). Distance learning is a learning process using an electronic series (LAN, WAN, or internet) to deliver the learning materials, interactions, or guidance. Furthermore, Rosenberg (2001) asserted that distance learning refers to the use of internet technology to deliver a series of solutions to develop knowledge and skills. This is in line with the opinions delivered by Campbell (2002) and Kamaga (2002) emphasizing that the use of internet in education is the principle of e-learning. In addition, OnnoW.Purbo (2002) explained that the term "e" such as in "e-learning" is used for all technologies using to support the learning efforts utilizing internet, intranet, satellite, tape audio/video. Interactive TV, and CD-ROM as parts of electronic media used in learning delivered either synchronously (at the same time) or asynchronously (at different time).

This evaluative research aims at describing and analyzing the implementation of distance learning with the Context, Input, Process, and Product (CIPP) approach. This evaluative research tried to find the meaning of learning participants' behaviors, describe the learning process, explore the most appropriate research and development approach using Context, Input, Process, and Product (CIPP) components. After understanding the happening phenomena, the subjects under study were evaluated based on their daily life conditions.

Input evaluation was greatly important to consider the success of distance learning implementation at the Merchant Marine Polytechnic (PIP) Semarang. Input evaluation did not only reveal in the existing phenomena at the institutional environment (both material and personal), but also predict the future possibilities when the program – in this research, the distance learning evaluation program at the Merchant Marine Polytechnic (PIP) Semarang – is implemented (Hasan, 2008:217). According to Stufflebeam (1996), an expert in management, required the policy makers to make decisions. CIPP stands for Context, Input, Process, and Product. Context component was used to evaluate needs, problems, and opportunities in determining purposes and reveal the quality of graduates. Input component was used to plan the activities and coordinate the maximization of the existing human resources. Process component was used to evaluate the distance learning program planning and implementation at the Merchant Marine Polytechnic (PIP) Semarang referring to the predetermined purposes. Product component was used to identify and evaluate the effectiveness (Daniel L Stufflebeam, 2017:279).

Method

This evaluative research was descriptively and quantitatively analyzed. The research population was all lecturers and instructors with a total of 86 participants. The data was collected using questionnaire and interview. Before the questionnaires were distributed, the instrument validity and reliability had been conducted. The validity test result showed that the data was valid and possibly used for this research, although there were two non-valid questionnaire items. The reliability test result conducted using the Cronbach showed the context of 0.727, input reliability of 0.821, process reliability of 0.843, and product reliability of 0.819. The reliability test result showed that all CIPP components were reliable proven with the Cronbach Alpha result of bigger than 0.70. The data was then descriptively and statistically analyzed by evaluating the implementation of distance learning program at the Merchant Marine Polytechnic (PIP) Semarang using the CIPP model as the evaluative analytical instrument.

Results and Discussion

Lecturers/Instructors Evaluated Based on Context Component

Context evaluation was the preliminary condition of a distance learning activity. Context evaluation included the aspects of need-based computer utilization internet utilization for working/to obtain learning materials and internet networks. Context component in this learning was the whole knowledge and preliminary understanding

belonging to the lecturers/instructors that the implementation of distance learning was better directed and the learning objectives were eventually achieved. The description of context component was presented in the following table 1.

Table 1. The Description of *Distance Learning* Evaluated with the CIIP Model at the Merchant Marine Polytechnic (PIP) Semarang

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Context	86	36.00	65.00	51.2442	5.62125
Input	86	31.00	50.00	39.5930	4.11133
Process	86	74.00	104.00	81.4419	6.79204
Product	86	107.00	160.00	121.9651	9.41769
Valid (listwise)	N 86				

Source: Processed Primary Data, 2020.

Based on the data presented in Table 1 above, it can be explained that the distance learning evaluated using the CIIP model was described as follows: the mean Context component was 52.2442 with the standard deviation of 5.56125, the mean Input component was 39.5930 with the standard deviation of 4.11133, the mean Process component was 81.4419 with the standard deviation of 6.79204 and the mean Product component was 121.9651 with the standard deviation of 9.41769.

The detailed description of each context, input, process and product (CIIP) was respectively explained below.

The Lecturers/Instructors evaluated Based on Context Component

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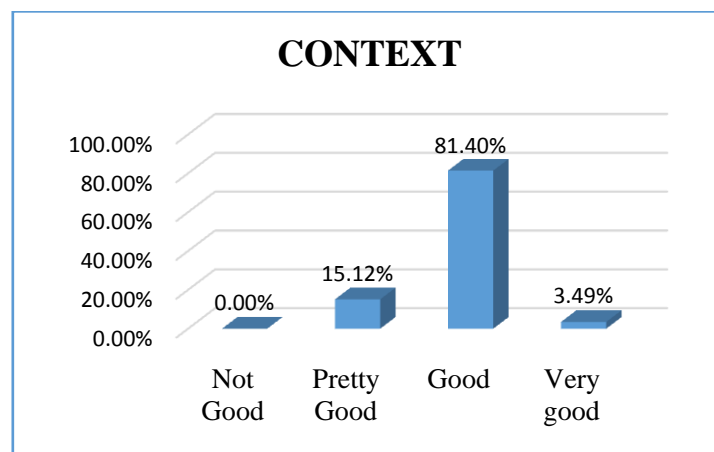


Figure 1. The Description of Distance Learning based on the *Context* Component at the Merchant Marine Polytechnic (PIP) Semarang

Source: Processed primary data, 2020

Based on Figure 1 above, it shows that the implementation of distance learning on the lecturers'/instructors' knowledge and understanding was 3.94% and classified into very good category. 81.40% lecturers/instructors had very good knowledge, and 15.12% lecturers/instructors had pretty good knowledge. The analysis result on the description presented in Figure 1, it shows that most 81.40% lecturers had good distance learning knowledge and understanding. Thus, it was proven that the lecturers/instructors' had good distance learning understanding and knowledge based on the context component.

In the context component, the lecturers/instructors commonly needed internet for working/to obtain teaching materials. The lecturers/instructors are now facing the millennial generations to keep up with the recent development of digital world. Learning plans, instruments, and materials were greatly required in distance learning. Qualified distance learning should always be prioritized. The Context component analysis result indicated that the most important element for lecturers was to plan activities to achieve the expected learning objectives, that is, the learning which continuously maintains the quality and fun for the cadets of Merchant Marine Polytechnic (PIP) Semarang.

The Lecturers/Instructors Evaluated Based on Input Component

Input evaluation was the context component's advanced ability emphasizing on evaluating the implementation planning in a program. In this case, the input component included home internet network, distance learning effectiveness, learning objective achievement, learning schedule and scheme that learning activities might be successfully implemented. The descriptive analysis result on distance learning management evaluated with the input aspect was shown in the following Figure 2.

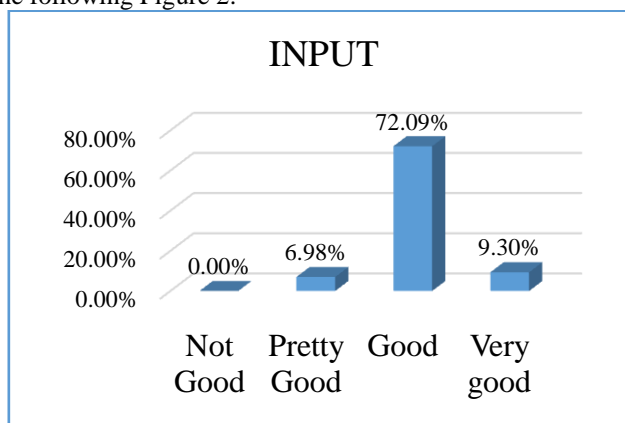


Figure 2. The Description of Distance Learning Based on Input Component at the Merchant Marine Polytechnic (PIP) Semarang

Source: Processed primary data, 2020.

Based on Figure 2 above, it shows that the distance learning based on input component included the implemented planning and distance learning program's objectives set by the administrator in which 9.30% participants said very good; 73.09% participants said good; and 13.95% participants said pretty good. From the result analysis, it shows that based on input component, most (72.09%) lecturers were classified into good category. Thus, it shows that based on input component, distance learning was considered in good category.

In this distance learning, the schedule was the same with usual one. However, the learning was implemented in different places by still wearing the tidy official uniform. The learning materials and facilities used were also the same as with the usual ones and able to be seen by the cadets. Communications, questions and answers, as well as structured tasks were also conducted through distance learning. The evaluation result of distance learning based on the input component was shown good, meaning that good input will produce good result corresponding to the learning expectations and objectives set with the internet-based distance learning model. This evaluation results were in line with the Stufflebeam theory saying that input component evaluation of cadets and lecturers as subjects directly involving in distance learning were the important and most related components. Competent lecturers with or without distance learning will give clear lectures and easily understood by the cadets of the Merchant Marine Polytechnic (PIP) Semarang.

Lecturers/Instructors Evaluated Based on Process Component

Process evaluation was conducted on the implementation of distance learning activities. The process component in distance learning was a planning implementation and activity documentation set by the administrator that the implementation would become more structured, systematic, and the objectives might be well achieved. The descriptive analysis result of distance learning evaluated with the process aspect was presented in Figure 3 as follows.

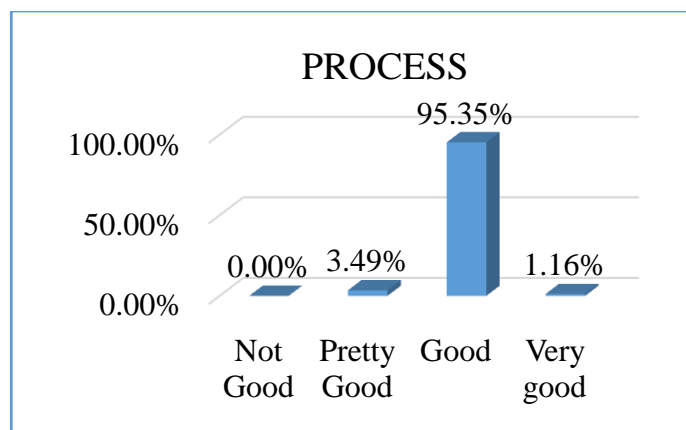


Figure 3. The Description of Distance Learning based on Process Component at the Merchant Marine Polytechnic (PIP) Semarang.

Source: Processed primary data, 2020.

Based on Figure 3 above, it shows the achieved distance learning plan and program implemented by the lecturers/instructors. In the Process component, 1.16% lecturers said that the distance learning process was very good, 95.35% lecturers said that the distance learning process was good, and 3.49% lecturers said that the distance learning process was pretty good. The descriptive analysis result showed that most lecturers were considered good in planning and implementing the distance learning program. The results of this research on distance learning activity process were classified into good category.

The distance learning process was well implemented by the lecturers/instructors that cadets might enthusiastically participate. Based on the observations and interviews conducted with some cadets, they preferred the distance learning activities than those conducted in dormitory by still following the dormitory rules. The materials were well delivered, the cadets well received the materials and were able to well complete the tasks although there were still some occurring problems, such as less-maximal internet network, more internet quota, huge data capacity, and of course costly.

Lecturers/Instructors Evaluated Based on Product Component

Product evaluation was conducted on the implemented distance learning. This evaluation was used to see how far the learning objectives were achieved. Product component in this distance learning was the evaluation on plan implementation, activity documentation, and others should be performed after the learning process ended. The descriptive analysis on distance learning management from the product aspect was presented in the following Figure 4.

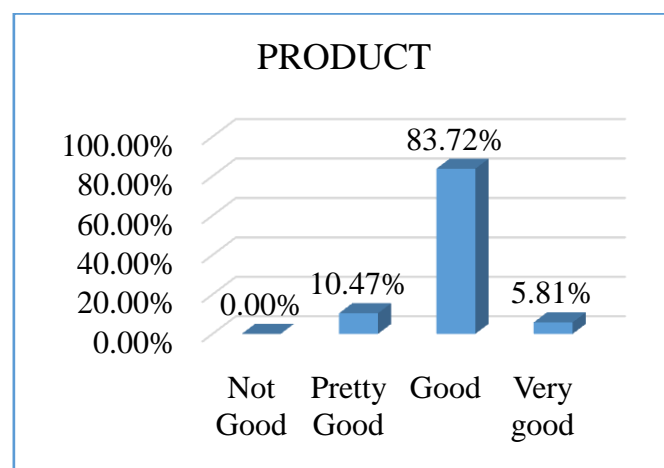


Figure 4. The description of Distance Learning based on Product Component at the Merchant Marine Polytechnic (PIP) Semarang

Source: Processed Primary Data, 2020

Based on Table 4 above, it shows that to see the achieved results, many things should be performed after the distance learning program was completed. The descriptive analysis result showed that distance learning based on the Product component, 5.81% lecturers said very good, 83.72% lecturers said good, and 10.47% lecturers

said pretty good. Based on the analysis result, it shows that most lecturers based on product component said good. Thus, the distance learning evaluated based on product component was classified in good category. This shows that the plan and program implemented by the lecturers/instructors of Basic Safety Training through distance learning was considered good.

In theory learning, this distance learning might support the daily learning process when various activities should be performed at the same time. However, for practicum learning which required laboratories, visual aids, simulators or workshops, distance learning could not support because practicum learning should be conducted in each field based on the required expertise and skills. This might be implemented through the block system for real practicums, yet the preparation, plan, rundown, administration and evaluation might be performed through online.

Recapitulation of Distance Learning Evaluation using CIPP Model

The Merchant Marine Polytechnic (PIP) Semarang also held the oceanographic education and training to support the cadets' expertise on ship, such as Basic Safety Training. Competent lecturers/instructors were able to attractively manage classes, master the methods, and deliver the materials. Simultaneous distance learning evaluation result at the Merchant Marine Polytechnic (PIP) Semarang using CIPP model was shown in the following Figure 5.

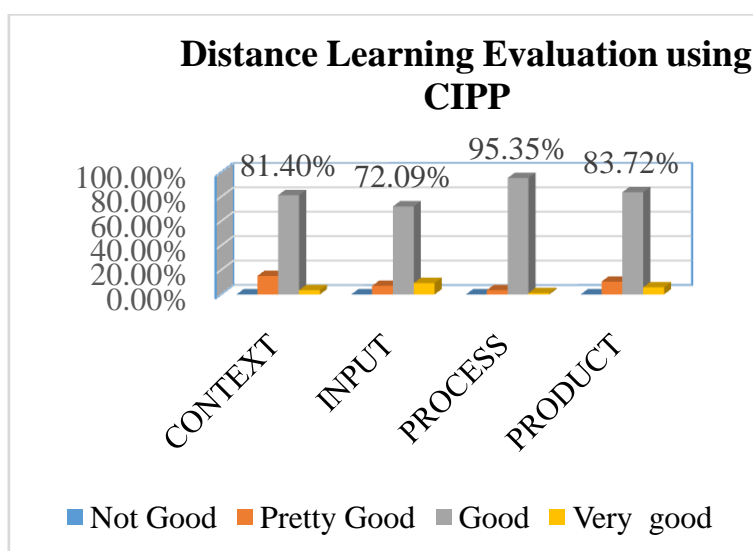


Figure 5. The Description of Simultaneous Distance Learning based on CIPP Component at the Merchant Marine Polytechnic (PIP) Semarang

Source: Processed primary data, 2020

Based on Figure 5 above, it might be descriptively explained that the evaluation result of distance learning at the Merchant Marine Polytechnic (PIP) Semarang was good as proven with the result of all distance learning implementation components of above 70% and classified into good category. The descriptive analysis results respectively showed the context component of 81.40%, input component of 72.09%, process component of 95.35% and product component of 83.72%. The mean distance learning implementation simultaneously evaluated with the CIPP components at the Merchant Marine Polytechnic (PIP) Semarang was 83.14% at the percentage interval of 61%-80% and classified into good category. Thus, the evaluation result showed that the distance learning at the Merchant Marine Polytechnic (PIP) Semarang was classified into good category.

The research findings showed that in distance learning evaluated with CIPP model at the Merchant Marine Polytechnic (PIP) Semarang, input was the lowest component, yet still in good category. Process was the most dominant component in the distance learning implementation evaluated using CIPP model with the value of 95.35% and classified into good category. This finding means that distance learning process have notified and fulfilled the organization's expectations. Planning and distance learning program have been well implemented by the lecturers/instructors. The basic competence clarity was well achieved during the distance learning activities as well as the materials which have provided the benefits in meeting the lecturers' and cadets' needs. These findings were in line with the Stufflebeam theory explaining that process evaluation was related to the planning implementation. The process evaluation of distance learning activities was related to the planning implementation made for the distance learning purposes corresponding with the expectations of Merchant Marine Polytechnic (PIP) Semarang.

Conclusion

The distance learning implementation success at the Merchant Marine Polytechnic (PIP) Semarang using the CIPP model was good, with the mean percentage of 83.14% and percentage interval of 61% - 80% and in good category. From each CIPP model, (1) context component was 81.40% and in good category. This result showed that the preliminary understanding and knowledge of lecturers/instructors to the distance learning implementation was considered good. (2) Input component was 72.09% and in good category. The result showed that the planning and program objectives in the distance learning activities have been well implemented by the lecturers/instructors and considered in good category. (3) Process component was 95.35% and in good category. This showed that the planning and program in the distance learning activities have been well implemented by the lecturers/instructors and considered very good. (4) Product component was 83.72% and in good category. This showed that the planning and program in distance learning activities have been well implemented by lecturers/instructors and considered good. The clarity of success indicator and distance learning implementation were shown with the tasks and responsibilities of participants covering all cadets and lecturers in teaching based on their competencies.

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