

Blended Learning and Its Impact on Learning Performance: A Study on Vocational Education

F. PambudiWidiatmaka^a, Tri Joko Raharjo^b, I Made Sudana^b, WirawanSumbodo^b

^aStudent, Universitas Negeri Semarang, Indonesia

^bLecturer, Universitas Negeri Semarang, Indonesia

Article History: *Do not touch during review process(xxxx)*

Abstract: One of the innovations in learning is the presence of blended learning. Lectures can conduct face-to-face lesson for the student. However, blended learning adds richer learning experiences. The existence of blended learning is an essential component. Hence, education can provide a background for students to acquisition competence. The better the fact of blended learning can improve the learning process in terms of cognitive, affective, and psychomotor. This research aimed to analyze the effects of blended learning on the learning process and its output to measure learning performance. This research was conducted at the Merchant Marine Polytechnic at Semarang (Polytechnic IlmuPelayaran Semarang) by using one of the classes to measure learning performance to measure the process and measurement results be known. In the academic process, the results of this study reinforce previous research, which shows that blended learning by using learning experiences is better than an only face-to-face meeting, will encourage a more comprehensive understanding of cognitive, affective, and psychomotor aspects.

Keywords: Blended Learning, Cognitive, Affective, Psychomotor

1. Introduction (Times New Roman 10 Bold)

At present, the very rapid development of technology has triggered the emergence of new learning media that facilitate the teaching and learning process wherever they are without being constrained by distance. Learning no longer relies on face to face in the classroom (conventional). Blended learning is an effort to expand access to education services. Expanding access to education services will support educational equality programs and improve the quality of education. Every educational institution must pay attention to student understanding because the expansion and convenience of educational services will impact increasing the number of students who choose these educational institutions.

Programs to expand access to education services can implement using distance education methods. Based on the Indonesian Higher Education Law number 12 in 2012, article 31 concerning distance learning explains that distance learning is a teaching and learning process carried out remotely through various communication media. Any binding rules like conventional education do not bind distance learning. However, distance learning rules refers to regulations and guidelines as in conventional education. Distance learning requires students to be more independent, disciplined and have a high responsibility(Hrastinski, 2019).

Distance learning facilitates the learning process for students who receive education while working with a high workload like a sailor. The learning process is carried out by e-learning at certain times, which is more flexible according to the time availability of seafarers. The distance learning method is stake up by technological advances that allow the distribution of education for seafarers sailing both domestically and abroad. In addition, e-learning can be carried out interactively by teachers and students, thereby attracting attention and giving more enthusiasm to continue education amid tiring work (Cronje, 2020).

However, distance learning also needs special attention in several ways, including students' inconsistency with learning hours, delays in capturing material, and other problems in the learning process, such as internet disruptions and power outages (Shamsuddin & Kaur, 2020). Thus, the learning model in distance learning should be e-learning / online and be combined with face-to-face / offline meetings. This can help solve problems in distance learning. Blended learning is a learning model that combines face-to-face learning in the classroom with e-learning(Dziuban et al., 2018). Blended learning arises because of weaknesses in the face-to-face / conventional learning process, which tends to be boring, reducing students' learning motivation and some shortcomings of e-learning(Bouilheres et al., 2020). The combination of learning in blended learning becomes its attraction because face-to-face learning becomes a solution for miscommunication during e-learning (Wardani, et al, 2018). Blended learning will be more effective if students have high awareness in

understanding the meaning of learning, for that it is necessary to make an appropriate approach. The transformation of the learning method combined with students' practice is performed so that the teaching and learning process is more effective than the conventional method.

The existence of a dynamic in the educational process can require an alternative solution to each of the existing problems, one of which is developing at this time is the limitations of learning so that students cannot learn following the educational process in the past. This is due to meeting restrictions face-to-face caused by the Corona pandemic, namely covid-19. The existence of face-to-face learning or traditional learning is expected to provide a comprehensive understanding to students. That is, students can obtain material provided by the teacher orally or various methods in the classroom. The hope that arises is that the material provided can provide a comprehensive understanding and students can actively discuss the existence of a discussion space between students and teachers can provide a better understanding (Long & Van Hanh, 2020). However, due to these limitations, learning shifts to online learning or online learning online have both weaknesses and strengths if the online learning process is executed continuously. It is a learning process that emphasizes psychomotor aspects.

2.Literature Review

Curriculum theory develops because education is close to society. Education is expected to be able to produce graduates who can benefit the wider community. The existence of a curriculum is a guide that can be created so that the education process can match the expectations of the community and graduates have certain standards to obtain a certificate or diploma. The existence of the curriculum has an important role to be the basis for the development of research development that is able to provide an insight that can be used for the benefit of the wider community.

The curriculum has an important role in improving quality and maintaining education following the expected output (Jonker et al., 2020). First, the curriculum is a written document that contains various methods and strategies which are basically plans so that education can run according to predetermined goals. These plans have various steps that instructors, teachers, and lecturers can implement to develop learning strategies tailored to different classes or study groups. Second, the curriculum indicates that as an existing system in a school, the curriculum system is designed to make decisions about its implementation and plans that can be carried out. Third, based on this implementation, the existence of a curriculum can identify the field of education. (Wijngaards-de Meij & Merx, 2018)

The concept of distance learning, better known as distance learning or distance education, is an educational system in which there is a separation between teachers and students in space and time. Distance learning is generally in the form of planned and systematic activities consisting of preparation, presentation of teaching materials, and supervision and learning support of students, which is achieved by bridging the physical distance between students and teachers through appropriate learning media. Thus, distance learning is an educational process in which a significant proportion of teaching is enforced by a teacher separated by space and time from the student.

Model Blended learning is a learning model that combines face-to-face learning in the classroom with e-learning. Face-to-face learning is commonly referred to as conventional learning, which requires educators and students to meet directly in a class that is bound by a lecture contract at a time determined by the educational institution. On the other hand, the learning Management System (LMS) is one of the applications of distance learning programs whose implementation is not limited by time and space but is controlled by binding regulations regarding e-learning so that learning can still run smoothly even without face-to-face contact (Choppin et al., 2018).

Blended learning developed when weaknesses appear in conventional learning or e-learning. In addition, blended learning is also developed because it has its own advantages when combined. The advantages of blended learning include the freedom of students to study subject matter independently by utilizing materials available online. Blended learning provide ease of communicating/discussing between students and teachers or other students. Learning activities can be carried out in class and outside the classroom by utilizing technology to add to the subject matter and questions given in class or online, which are managed and controlled in such a way by the teacher (Alvunger, 2018).

3. Method

This study adopts the ADDIE model with 5 stages, namely analyzing, designing, developing, implementing, and evaluating (Forest, 2017; Kurt, 2017). The description of these stages is as follows, the analysis is used to determine the process of a phenomenon that is happening at this time. The analysis is carried out with various research instruments that can describe the realities coherently and clearly. When the researcher has been able to analyze, the next process is to design a development that can solve a development problem based on a theory that is expected to solve the problem. The development is carried out in stages to facilitate the model that has been

produced from the design of a theory. This development is expected to be a picture that can solve the problem. At the implementation stage, model development is carried out to be tested directly on respondents. Based on the implementation, it will be known whether a design and development have succeeded in solving the problem. Implementation is needed to obtain feedback from the models that have been developed. The next stage is to evaluate, namely to find out the weaknesses or strengths of a model so that it can be refined in further research

In this research, the steps are described as follows: Research and gathering information by conducting a literature review to obtain references regarding the blended learning model. Planning through preliminary research to explore the implementation of distance education with a blended learning model on board. Conducting literature studies and needs analysis to explore data regarding the implementation of distance education with the blended learning model for student officers (pasis). Initial product development: developing a blended learning model development design for student officers (pasis). Expert validation to obtain a revised model; Main field trials by doing empirical validation. Develop a blended learning model for student officers (pasis). Limited trials and extended trials to obtain input regarding implementing the blended learning model for student officers (pasis) on board. To produce a final blended learning model for student officers (pasis) on board and test the model's effectiveness.

4. Result and Discussion

The factual model is a model that describes the actual conditions in the field. The factual model obtained from the observations in the learning process at the Merchant Marine Polytechnic at Semarang. In addition, the factual model is obtained through various sources that are able to provide a real picture representation of the lecture process conducted by student officers at the Merchant Marine Polytechnic at Semarang. The process describes coherently from the planning process to evaluating the learning carried out by the lecturer. These activities involve various parties, especially when the lecture process begins so that adequate facilities and infrastructure can be obtained (Hrastinski, 2019)

Merchant Marine Polytechnic at Semarang has used a management model that has been the principle of management, namely planning, organizing, implementing, and evaluating. These activities have been carried out through various forms of effort so that the lecture process can be carried out in effective learning (Cronje, 2020). Thus, the lecture process starts from planning to evaluating or controlling to evaluate the learning process so that it can produce output in the form of student officers who have competencies under the certificates they have.

In the factual model for conducting lecture activities, five aspects determine the process of delivering material, in management, it can be known as the production factor to be able to produce goods or services, so that the existence of these factors determines the success of the lecture process at the Merchant Marine Polytechnic at Semarang. Based on research conducted using the questionnaire method, it can be concluded that the educational model that uses the face-to-face method is deemed inefficient and less effective for student officers because it requires a certain location to take education. In the context of this research, student officers are required to attend the Merchant Marine Polytechnic at Semarang to obtain education to carry out face-to-face activities. However, some situations make it impossible to have face-to-face meetings caused by the Corona pandemic (Shamsuddin & Kaur, 2020). Therefore, achievement of educational goals is the main aspect that needs to be considered in carrying out blended learning. In accordance with the results of existing research, it is currently applied only to distance education in the form of online learning so that there has not been found a guide that specifically regulates blended learning. combines online learning with education that emphasizes psychomotor aspects. At this time what was found was face-to-face education which was transformed into online form so that the cognitive aspect was still much emphasized, meaning that vocational education had not yet found the right concept in online education.

Blended learning is an educational process that combines several methods, which means having a combination of methods that can make it easier for student officers to comprehensively understand the material presented by lecturers or instructors with an efficient and effective educational process, meaning that student officers get material with a good flexible process. in terms of time and cost. Efficiency is meant to be able to maximize the understanding received by student officers by sacrificing the least possible cost and the most effective allocation of time so that they can obtain an educational process that remains of quality in accordance with the objectives of education. In terms of costs, student officers do not need to always come to class but the most important emphasis is understanding the material well and being able to apply it. Basically, education at the Merchant Marine Polytechnic at Semarang is vocational education, so that the expected output is that student officers can do well. Implement what has been learned in the process and practice. This can support educational attainment, namely that student officers are able to apply and implement the material that has been studied in a ship or a machine having their respective problems that can be understood through practice, so that theoretical explanations and understanding of cognitive aspects are needed. However, only a few of the largest proportions

are in terms of psychomotor, namely the practice of being able to perform an action and be carried out in accordance with the rules so that it is true that it can be done, the result that can be assessed is the success in repairing or making a machine back to normal as before. When there are obstacles related to machines, student officers can optimally implement what they have learned and are based on past experiences so that the psychomotor aspect is the most important component and the largest proportion (Suartama et al., 2019).

Blended learning has several scenarios. Based on the theoretical model, blended learning cannot be separated from the technological aspect because blended learning will integrate cognitive and psychomotor skills for student officers based on technology related to current conditions, namely the Covid-19 pandemic, the existence of technology will be complicated. Separated from blended learning because the existence of a distance learning model or known as online learning, will facilitate interaction between student officers and instructors and lecturers to communicate with each other or discuss to be able to solve problems together (Jowsey et al., 2020). The competencies that are expected to be achieved can be implemented through the online learning process to communicate or mutual transfer of knowledge from lecturers to student officers. This can be done through a blended learning process, one of which is distance learning that can be implemented.

This study conducted a trial on the group without blended learning (group A) and used blended learning (Group B), as shown in table 1. The results showed that the average group without blended learning was 73.42, while the group that utilized blended learning had a higher value, namely 84.30.

Table 1. Group Statistics

	Group	N	Mean	Std. Deviation	Std. Mean Error
VAR00001	A	12	73.42	3,728	1,076
	B	10	84.30	3,093	.978

Table 2 shows significant results (<0.05), which indicate that there are differences between groups. Namely, group A is different from group B, meaning that blended learning has implications for students' understanding.

Table 2. Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	0.063	0.804	-7,353	20	0	-10,883	1,480	-13,971	-7,796
Equal variances not assumed			-7,483	20,000	0	-10,883	1,454	-13,917	-7,850

Blended learning has several scenarios. Based on the theoretical model, blended learning cannot be separated from the technological aspect because blended learning will integrate cognitive and psychomotor skills for student officers based on technology related to current conditions, namely the Covid-19 pandemic, the existence of technology will be complicated. Separated from blended learning because the existence of a distance learning model or known as online learning, will facilitate interaction between student officers and instructors and lecturers to communicate with each other or discuss to be able to solve problems together (Jowsey et al., 2020). The competencies that are expected to be achieved can be implemented through the online learning process to communicate or mutual transfer of knowledge from lecturers to student officers. This can be done through a blended learning process, one of which is distance learning that can be implemented.

Several methods can be used in the learning process using the blended learning method, one of which is as follows: The first scenario is a small class, meaning this is a very standard class so that blended learning can be used to provide understanding to several student officers with limited student officers to able to take part in lecture activities based on blended learning. This scenario is adapted from books related to problem-solving to

initiate formulating, activating and implementing machinery onboard this course. This course can traditionally be delivered through face-to-face meetings for 3 hours of lessons for one week supported there is a teaching material that can be used as reading material for student officers have two tasks and one exam to be able to evaluate the success of learning carried out when traditional or conventional learning is carried out case studies are used and there are discussions that are dominated by several people or individuals who are in a class where there are perceived obstacles emerges from educators or lecturers who can become obstacles or reduce the learning component by including material in the learning management system, which means that there is duplication of material that can be done by the lecturer when face-to-face learning is carried out with online learning. In addition, Student officers have limitations to access to materials that can enrich his knowledge with a lot of documents that need to be read the existence of too many sources on the internet can confuse student officers who read and reduce comprehensive understanding because there is too much material so that they cannot focus on one aspect there are challenges to being able to redesign and find meaning to be able to approach student officers with meaning closer learning the assumption that arises is that student officers in general will find interesting discussions and the values contained in the course statements that arise are student officers associate that participation in a discussion will be linked to learning evaluation, namely in terms of assessment a lot of material so that it cannot focus on one aspect there are challenges to being able to redesign and find meaning in being able to approach student officers with a closer meaning The value contained in the statement course that appears is that student officers associate that participation in a discussion will be linked to the evaluation of learning, namely in terms of assessment a lot of material so that it cannot focus on one aspect there are challenges to being able to redesign and find meaning in being able to approach student officers with a closer meaning The value contained in the statement course that appears is that student officers associate that participation in a discussion will be linked to the evaluation of learning, namely in terms of assessment interesting and the values contained in the statement course that appear are student officers associate that participation in a discussion will be linked to learning evaluation, namely in terms of assessment interesting and the values contained in the statement course that appear are student officers associate that participation in a discussion will be linked to learning evaluation, namely in terms of assessment (Lin et al., 2017).

Solving problems in a class using the blended learning method is to strengthen the existing methods in the approach, one of which is by using case studies so that oral learning can be reduced and strengthening case studies so that student officers can understand the problems at hand. encouraging a more comprehensive understanding and spurring student officers to be able to analyze more deeply about if a case study is related to machine failure, the appropriate analysis can be used by student officers to discuss the problems at hand and how to solve them This can encourage there is an exchange of knowledge between student officers and student officers to acquire new knowledge from instructors and lecturers, the existence of case studies to be able to bridge learning experiences and new knowledge can encourage acquired abilities and expertise to become more presence of lecturers to be able to provide face-to-face meetings can be reduced Namely by increasing the portion of case studies This can be done with various One way is by having instructions or guides that use a learning management system so that the guides can be read by student officers so that these officers are able to understand well what is the problem and how to solve it. This can encourage a complex understanding and can make learning by emphasizing psychomotor aspects because it encourages student officers to hone their knowledge and solve a problem that is being faced by a case study is one part that instructors or lecturers can do to form a logical understanding and problem solving that can be used in blended learning. Part of the time at the beginning the lecturer or instructor explains the problems that exist and theoretically the solution that can be used on the next hand the student officers will solve a problem based on problem solving so that based on debriefing carried out by lecturers or instructors, student officers are able solve and develop the problem effectively and efficiently.

5. Conclusion

The blended learning process emphasizes the problem analysis aspect. The main objective of case study learning is to involve student officers in meaningful and continuous learning. It can be achieved by evaluating student officers, it can be shown that student officers are able to find a discussion that is not only interesting but most of the student officers agree that online discussion learning and completion Such case studies can contribute to a better understanding of the content being studied or the subdivision of machinery being analyzed.

References

1. Alvunger, D. (2018). Teachers' curriculum agency in teaching a standards-based curriculum. Curriculum Journal. <https://doi.org/10.1080/09585176.2018.1486721>

2. Bouilheres, F., Le, L. T. V. H., McDonald, S., Nkhoma, C., & Jandug-Montera, L. (2020). Defining student learning experience through blended learning. *Education and Information Technologies*. <https://doi.org/10.1007/s10639-020-10100-y>
3. Choppin, J., Roth McDuffie, A., Drake, C., & Davis, J. (2018). Curriculum ergonomics: Conceptualizing the interactions between curriculum design and use. *International Journal of Educational Research*. <https://doi.org/10.1016/j.ijer.2018.09.015>
4. Cronje, J. C. (2020). Towards a new definition of blended learning. *Electronic Journal of E-Learning*. <https://doi.org/10.34190/EJEL.20.18.2.001>
5. Dziuban, C., Graham, C. R., Moskal, P. D., Norberg, A., & Sicilia, N. (2018). Blended learning: the new normal and emerging technologies. *International Journal of Educational Technology in Higher Education*. <https://doi.org/10.1186/s41239-017-0087-5>
6. Forest, E. (2017). ADDIE Model: Instructional Design. *Frameworks & Theories*.
7. Hrastinski, S. (2019). What Do We Mean by Blended Learning? *TechTrends*. <https://doi.org/10.1007/s11528-019-00375-5>
8. Jonker, H., März, V., & Voogt, J. (2020). Curriculum flexibility in a blended curriculum. *Australasian Journal of Educational Technology*. <https://doi.org/10.14742/ajet.4926>
9. Jowsey, T., Foster, G., Cooper-Ioelu, P., & Jacobs, S. (2020). Blended learning via distance in pre-registration nursing education: A scoping review. In *Nurse Education in Practice*. <https://doi.org/10.1016/j.nepr.2020.102775>
10. Kurt, S. (2017). ADDIE Model: Instructional Design. *Frameworks & Theories*.
11. Lin, Y. W., Tseng, C. L., & Chiang, P. J. (2017). The effect of blended learning in mathematics course. *Eurasia Journal of Mathematics, Science and Technology Education*. <https://doi.org/10.12973/eurasia.2017.00641a>
12. Long, N. T., & Van Hanh, N. (2020). A structural equation model of blended learning culture in the classroom. *International Journal of Higher Education*. <https://doi.org/10.5430/ijhe.v9n4p99>
13. Shamsuddin, N., & Kaur, J. (2020). Students' learning style and its effect on blended learning, does it matter? *International Journal of Evaluation and Research in Education*. <https://doi.org/10.11591/ijere.v9i1.20422>
14. Suartama, I. K., Setyosari, P., Sulthoni, & Ulfa, S. (2019). Development of an instructional design model for mobile blended learning in higher education. *International Journal of Emerging Technologies in Learning*. <https://doi.org/10.3991/ijet.v14i16.10633>
15. Wijngaards-de Meij, L., & Merx, S. (2018). Improving curriculum alignment and achieving learning goals by making the curriculum visible. *International Journal for Academic Development*. <https://doi.org/10.1080/1360144X.2018.1462187>