

## **The Effectiveness of Online Teaching and Learning in Polman Bandung**

**Nia Nuryanti Permata<sup>1✉</sup> and Dini Hadiani<sup>2</sup>**

<sup>12</sup> Politeknik Manufaktur Bandung  
✉ Jl.Kanayakan No.21 Bandung 40135, Jawa Barat, Indonesia  
E-mail: nia@polman-bandung.ac.id

---

### **Article Info**

---

#### *Article History*

Received:  
Feb 2021  
Accepted:  
June 2021  
Published:  
Nov 2021

---

#### *Keywords:*

*Polytechnic, Teaching and  
Learning Effectiveness,  
Online Teaching and  
Learning*

---

---

### **ABSTRACT**

This article reports the effectiveness of online teaching and learning in a polytechnic institution. The online teaching and learning during the Covid 19 pandemic have made a challenging situation. Moreover, the subjects or courses at Polman Bandung consist of the Theory course (e.g., Maths, English, Strength of Materials) and Practice course (e.g., Technical Drawing, CNC Machine practical program, Bench-work). What happens in the online classroom and its effectiveness should be known and considered by its academic officer. In general, the target to be achieved in this study is to provide an overview of online learning and measure online learning effectiveness in 2020. The research method used is a descriptive study. Data collection was done by distributing questionnaires to the third-grade students who have had or are currently implementing online learning in Theory and Practice courses. There were 231 questionnaire data collected. Besides, semi-structured interviews with students and lecturers were also carried out. The study results show that the teaching and learning effectivity carried online were scored in 3.25 by students (scale 1- 4), meaning it is still inadequate performance. Both Theory and Practice courses were challenging for students and lecturers, but the practice was considered more challenging. Some departments could not hold Practice courses entirely online due to the laboratory tools and machines needed. Therefore, it is recommended that the lecturer improve their online teaching skills and interact more with students in the Theory course and Practice course. The students should better communicate with the lecturers and, most importantly, handle significant learning challenges. Then, the institution should make a better system and program to help the lecturer to teach online.

© 2021 Politeknik Negeri Bali

---

### **INTRODUCTION**

Because of the COVID-19 pandemic, the learning system throughout Indonesia, even the world, has changed. Implementation of online learning is a solution to ensure learning can still be carried out, even though there is a reduction in content. This activity is done to comply with

government policies in physical distancing and PSBB (Large-Scale Social Restrictions). In essence, whether ready or not, the pandemic conditions have forced learning to be carried out online.

Several studies have shown that online learning can increase learning independence, interest, and motivation, the courage to express ideas and questions, and provide convenience and flexibility (Sadikin and Hamidah, 2020; Rusdiana and Nugroho, 2020). Meanwhile, the adverse effects of online learning are weak student supervision, lack of signal strength in remote areas, high quota fees, and the decrease in students concentration due to the excessive workload (Alchamdani et al., 2020; Febrianto et al., 2020). These problems would eventually affect the students' achievement in learning.

The student's perspective on online learning has obtained mixed results. Most students were reported to experience problems implementing online learning, even though they later stated that they could overcome them (Karlina et al., 2020). Some others, however, admitted to being positively impacted during the covid-19 pandemic, especially at the higher education level. They are interested in using online learning because it can be accessed flexibly, and the best application used by lecturers and students was the WhatsApp application (Sujarwo et al., 2020). A similar result was mentioned in another study. It found that online learning during the COVID-19 pandemic was implemented quite effectively, and online learning allows learning to be carried out anytime and anywhere. The adjustment of the material during the implementation of online learning is a determining factor for student learning outcomes. (Suprianto et al., 2020). However, some students in higher education have a different opinion. A study found that most prosthetic major orthotic students felt that the online learning process was ineffective (Rachmat, 2020). This study also found that the students used google meet, google classroom, and WhatsApp Groups during the online learning process. The students thought that live video conferencing is the most effective learning method.

Also, Hamid et al. (2020) and Joesyiana (2020) conducted research showing that students perceived that online learning during the Covid-19 period was not entirely effective. The students admitted that the limited space for interaction between students and lecturers in online learning decreases students' interest in learning and their lack of understanding of lecture material that the lecturer does not directly explain face-to-face. Besides, online learning is believed to be effective if the readiness of the teacher, the ability to use applications, the use of proper technology, the quality, and teachers' competence to enhance and to encourage learners to engage in the online learning environment are available (Simatupang et al., 2020; Rifiyanti, 2020). Therefore, it can be concluded that the implementation of online learning during the covid-19 pandemic has different results, and its effectiveness relies on several factors, including the availability of sufficient facilities and human resources.

Concerning the research site, the education system in the polytechnic institution is challenging. In its Curriculum Compilation Guidance (Polman Bandung, 2016), it is mentioned that the education in Polman Bandung's goal is to produce graduates that have an 'industrial' culture. Then, to make Polman Bandung's culture, the educational activities have to be blent with research and development, engineering, and production, usually called Production Based Education (PBE). In its study program curriculum, it is stated that the learning process is

focussed more on practical. Almost two-thirds (2/3) of learning time spent are practice courses; meanwhile, one-third (1/3) is a theory course. Polman Bandung is a state polytechnic that focuses on the manufacturing world. Polman Bandung employs 60% practice and 40% theory in teaching and learning programs to produce skilful and competent students, specifically in hard skills related to their technical competence mastery (Ariyani & Hadiani, 2020).

Moreover, the courses in every Study Program's curriculum at Polman Bandung are the theoretical subjects, including compulsory national subjects such as social humanities, mathematics, natural sciences, and study program/department competence subjects. At the same time, the majority of practice courses are study programs/departments competence subjects. Practice courses are very dependent on the practical lab facilities, which are the resources of the department. Among the practical Lab facilities in Polman generally vary from manufacturing machines, induction furnaces to computers with supporting software. This phenomenon is because Polman Bandung is a Polytechnic of Manufacturing, dealing with industrial learning activities. There are four departments in Polman Bandung, namely Manufacturing Engineering (ME), Design Engineering (DE), Foundry Engineering (DE), and Automation Engineering (AE). All departments deal with industrial learning activities.

The theory course is carried out face-to-face between student class groups, usually 24 students and a lecturer. However, in the practice courses, the programs usually consist of fewer students, 4, 6, 8, or 12. In normal conditions, practice courses can be assisted by PLP (Pranata Laboratory Assistants) who are specifically tied to their respective labs and the lecturer as the course instructor. A practice course usually has several program courses that must be implemented in several different labs. For example, a practice course consists of 3 program courses, so the students are divided into three groups. Each group in each program course consists of 8 students, which each group has to follow the other two program courses in a different schedule. In general, the implementation of practice courses does require long hours to build skills and knowledge according to the study program taken by students.

In terms of the implementation of online learning in practice courses, several studies have shown different results. Maulana and Hamidi (2020) conducted research to determine student's perceptions against online learning of the practice course at vocational education during the corona-virus pandemic (COVID-19). The results showed that students' perceptions of online learning in practice courses positively emphasize the teaching and learning aspects, the capability aspect (Lecture's proficiency), and the facility and infrastructure aspects. A similar result by Ratnawati and Vivianti (2020) stated that students' perception of online practicum courses is positive. However, another study about the effectiveness of using E-Learning in theory and practice courses found that online learning is effective for theory courses, while practicum courses are less effective and more effective when conducted with face-to-face learning (Kholipah, Arisanty, and Hastuti, 2020). This situation is in line with the research conducted by Hikmat et al. (2020) that the effectiveness of online learning, namely for the theory course, is the highest value compared to the Field course as the lowest score. The research results by Limbong and Simarmata (2020) also revealed that the assessment of theory courses is the highest score, and the courses in the field got the lowest score.

As in Polman Bandung, during the pandemic in the odd semester of 2020-2021, all theory courses were run online. However, most practice courses are still carried out offline at the campus by following the rules from the local government (Bandung City and West Java) and the guidelines from the Ministry of Education. In addition, some practice courses are carried out online because they are considered possible to implement online. In addition, vocational activities such as lab work, studio, the workshop that cannot be replaced by online learning could be carried out in higher education institutions by paying attention to health protocols (Kemendikbud, 2020).

This pandemic condition will undoubtedly result in the learning system's strengths and weaknesses becoming increasingly gaping for higher education institutions. For example, when learning online, many students feel that distance learning is less relied on to improve student professional competence, according to the study program's target, because the material students learn while carrying out distance learning is not well understood (Darsono et al., 2020). Therefore, online learning's effectiveness needs to be studied in more detail to describe things that need to be improved to get effective learning.

With the implementation of online lectures, both theory and practice courses at Polman Bandung, as a campus community, researchers are interested in examining the realization of its implementation. In specific, the researchers are interested in examining the effectiveness of online teaching at Polman Bandung.

The Quality, Appropriateness, Incentive and Time (QAIT) model can measure effective learning, according to Slavin (2009). Among them is measuring (1) the quality of instruction, (2) the appropriate level of instruction, (3) incentives, and (4) time. This theory can be used to get an idea of the effectiveness of online learning at Polman Bandung.

#### 1. The Quality of Instruction

The quality of instruction is the extent to which the presentation of information or the ability to help students quickly learns the material (Slavin, 2009). The quality of teaching can be seen from the learning process and results. The learning process is seen from the suitability between teacher activities and student activities with the learning steps used. At the same time, the learning outcomes are seen from the students' learning completeness. Learning is complete if at least 85% of students achieve the minimum completeness criteria (Suryosubroto, 2009). Therefore, the quality of teaching is effective if the teacher's activities and student activities follow the discovery learning steps and student learning completeness reaches 85%. The suitability of teacher activities and student activities is seen from teacher activity that can meet the student activity in learning.

#### 2. The Appropriate Level of Instruction

The appropriate instruction level is the extent to which the teacher ensures that students are ready to learn a new lesson, meaning the skills and knowledge needed to learn it but have not yet acquired the lesson. Thus, the appropriate level of teaching is seen from students' learning readiness. As it is argued by Slameto (2010), student readiness can be seen from 3 aspects, namely:

- 1) Physical, mental, and emotional conditions.

2) Needs, motives, and goals.

3) Skills, knowledge, and other understandings that have been learned.

Therefore, the appropriate instruction level is effective when students are ready to learn, seen from how students cope with the classroom activity.

### 3. Incentives

Incentives are how the teacher ensures students are motivated to work on teaching tasks and learn the material presented. Incentives are seen from teacher activities in motivating students. Slameto (2010) states that there are four things teachers can do in motivating students, namely:

1) Generating encouragement for students to learn.

2) Explaining in concrete terms to students what can be done at the end of teaching.

3) Providing rewards for achievements to stimulate them to achieve better achievements in the future.

4) Providing good study habits.

In other words, incentives can be stated effective if the teacher's efforts in providing motivation are maximized, seen from the minimum teacher incentive criteria.

### 4. Time

Time is the extent to which students are given enough time to study the material being taught. Learning can be said to be effective if students can complete learning under the specified time allocation. Time is categorized as effective if students use the maximum time, seen from the criteria for using a minimum of good student time.

In conclusion, learning can be effective if the four indicators of learning effectiveness, namely the quality of instruction, the appropriate level of instruction, the incentives, and the time are effective.

This research is a step of curiosity about online learning conditions currently being carried out during the Covid-19 Pandemic. The condition of online learning and the extent of its learning effectiveness are also questions that stakeholders need to consider; the lectures in Polman Bandung are done in Theory and Practice situated in a laboratory/workshop.

Therefore, the main objective of this research is to get an overview of the effectiveness of online teaching implementation at Polman Bandung to provide feedback to institutions and lecturers so that they can take appropriate policies and teaching strategies that are even better in the future maintain the good ones.

## **METHODS**

The research method used is a descriptive study. The study participants were third-grade students of Polman Bandung in the odd semester of 2020-2021. There were 293 third graders in Polman Bandung in October 2020, but only 231 participants collected the questionnaires consisting of 42 female and 189 male students. The description of the subjects can be seen in Table 1 below.

Number	Description		
	Gender	Quantity	Percentage
1	Male	189	82
2	Female	42	18
Total		231	100

Table 1: Questionnaires Participants

The research stages included a pilot study that examined the conditions occurring in online teaching at Polman Bandung. After that, it was used to formulate a suitable questionnaire to get a picture of online teaching effectiveness. The questionnaire was then distributed to students whose classes carried out online, both Theory and Practice, started from Mid-march 2020; still, they also had experienced teaching and learning offline in classrooms and workshops. So all third grader students were invited to fill the questionnaire.

Items in the questionnaire are made by adopting Slavin's theory (2009), as shown in Table 2 below.

<b>Items for Quality of Instruction</b>
-Students understand the material provided by the lecturer
-Lecturers master the learning material presented
-The lecturer explains the learning material clearly
<b>Items for Appropriate Level of Instruction</b>
-Lecturers use useful teaching aids
-Lecturers understand the condition of students during learning (physical, mental & emotional conditions)
<b>Items for Incentives</b>
-Lecturers motivate students
-Lecturers provide an objective assessment
-Lecturers provide opportunities for students to argue and ask questions
-Lecturers provide feedback on assignments
-Lecturers provide assistance and guidance to student difficulties
<b>Items for Time</b>
-Lecturers use the available time effectively
-Lecturers provide sufficient time to do assignments

Table 2: Summary of Slavin's theory (2009)

The questionnaire was made so that students only assessed the courses taught by Polman lecturers. This instrument is to fully capture the quality of learning carried out by Polman lecturers. Then the questionnaire was distributed to the third-grader students. They were chosen as the sample because they could assess online learning, and they have experienced normal/offline learning longer than grade 2. All student respondents rated three types of courses. They are a General Social Humanities (Non-Technic) Theory Course, a Department/Study Program Competence (Technic) Theory Course, and a Department/Study Program Competence (Technic) Practical Course. Each student chose only one course (and one lecturer) in each type that they have joined.

After the results of questionnaires were collected, then student and lecturer interviews were carried out. The next step is the data analysis stage to get the results and formulate recommendations from the research results. Furthermore, the interview stage with six students and six lecturers was carried out to obtain valid data (triangulation). They were selected from every four departments in Polman, and then the two largest departments had two participants. The data analysis stage is then done to get the results and formulate recommendations from the research results.

Participants in interview	Manufacturing Eng. Dept.	Design Eng. Dept.	Foundry Eng. Dept.	Automation Eng. Dept.	Total
Students	2	1	1	2	6
Lecturer	2	1	1	2	6

Table 3: Interview Participants

The measuring instrument used is Slavin's theory (2009), which can measure learning effectiveness. Among them are measuring (1) the quality of teaching (quality of instruction); (2) the appropriate level of instruction; (3) incentives; and (4) time.

## RESULTS AND DISCUSSION

There were 231 questionnaires from the students as participants. The score scale is 1-4. The questionnaire gained information about the effectiveness of online teaching and learning from their perspectives. The findings are discussed below. The discussion is structured according to Slavin's theory (2009) on learning effectiveness measurement, which is (1) the quality of instruction; (2) the appropriate level of instruction; (3) incentives; and (4) time.

The student's questionnaires' results show the average number in online teaching and learning effectiveness. It can be seen in the following table.

<b>The Effectiveness of Teaching and Learning Online in Polman</b>	<b>Score</b>
Quality of instructions	3.272
Appropriateness level of Instructions	3.113
Incentives	3.304
Time	3.233
Total in average	3.23

Table 4: The Average Score of The Students' Questionnaires

The result shows that the effectiveness of online teaching and learning in Polman Bandung in 2020, which pandemic happens, is in a good score (3.23 on a scale of 4). Thus, although the students and lecturers faced some challenges, they could undergo the activities well.

Each category of the effectiveness of online teaching and learning is elaborated on in the following paragraphs.

### 1. Quality of Instructions

Based on the questionnaire, the students' answers concerning the quality of instruction are shown in the table below.

<i>Quality of Instructions</i>	Non-Technic Theory Course	Technic-Theory Course	Technic-Practice Course
Students understand the material provided by the lecturer	3.193	2.952	3.121
Lecturers master the learning material presented	3.599	3.546	3.556
The lecturer explains the learning material clearly	3.266	3.048	3.169
Avarage score	3.352	3.182	3.282
Total	<b>3.272</b>		

Table 5: The Average Score of The Students' Questionnaires

According to data shown in Table 5, students acquired that instruction quality from the Non-technic Theory course (e.g., Pancasila dan Kewarganegaraan, English, Management) has a better level than the Technic-theory (e.g., Strength of Materials, Control system, Safety Design), and Technic-practice (e.g., Maintenance Work, Programmable Logic Control, Advanced Presstool). Based on student interviews, they said that the non-technic lecturers had a better interaction with the students. They felt the lecturers teach them by explaining the subject as it is in face-to-face classroom instruction. It is not challenging for the students to ask questions on subject content and non-subject content. They feel free to interact. This phenomenon is in line with Hikmat et al. (2020) that online learning is effective for theory courses.

Then, from the result, the student's comprehension of the Technic-theory course was shown as the least score gained (2.952). Based on students' interviews, some lecturers on Technic-Theory only gave them tasks without giving enough lecturing/teaching. The students needed a lecturer to teach as if in the actual classroom activity. This situation is possibly due to the lack of lecturer's capability in using online media and the unavailability of material in the specific subject. The students should be given more time for mastering the subject by having more exercises and more opportunities to ask questions.

Online learning quality of instructions is still sufficient (3.272 of 4). Nevertheless, some challenges and obstacles can still exist the students' online quota, students' discipline when they are not in the same room as the lecturer. Video Conference media such as Zoom and Google Meet help build "as in class" situations with a predetermined schedule. The difficulty in explaining calculation and exact science concepts can be helped by using tablets or touch screens to act as whiteboards. Some lecturers have even made instructional videos more helpful in explaining the material repeatedly in different classes. This finding is in line with Hamid et al.'s (2020), who say that lecturers can use more flexible alternatives with asynchronous online learning to achieve the learning objectives.

However, learning theory courses can be useful as long as two-way interactions between lecturers and students are deployed in the classroom, and there is feedback on assignments/understanding of the material. So lecturers need to be creative and ensure that

students understand and participate in learning activities. This situation agrees with Slavin's (2009) theory stating that the teaching quality can be seen from the learning process in which teacher activities are suitable with student activities with the learning steps used.

For the online practice courses, there is an even more significant barrier. This phenomenon is because the Polytechnic's practice course is about improving skills following the study program/department's competence by directly using workshop tools or machines. However, due to schedule, which only two days/week are learning in the workshop offline, while the other three days/week is studying at home (online), so the length of hours spent on the workshop tools, equipment, and machines are only on those two days which was usually done in 5 days. Mainly for two departments (Manufacturing Engineering and Foundry Engineering) students, they need to learn directly on the workshop machines. The two departments' online learning is generally filled with reports and assignments related to the campus's two-day practice program. In general, with the students' reduced hours of learning with tools and machines, their skills less than the class of students who study in workshops longer. This situation is similar to the result of a study stating that implementing a practice course is effective if it is accompanied by face-to-face learning (Limbong and Simarmata, 2020).

Meanwhile, the Practice learning at the other two departments (Automation Engineering and Design Engineering) can be carried out online well, and even the Automation Engineering Department has implemented all practical courses entirely online. The practical course in these two majors can be carried out online as long as students already have qualified learning media, including laptops / PCs compatible with the engineering software (application) needed in learning. Except for freshmen students who need to be taught by "close guidance" first to understand how to use the engineering applications. However, the students' 'technical' troubleshooting abilities cannot be maximally honed, besides the developing students' attitudes and mental during working cannot be done entirely by the lecturer. Studies support this phenomenon that online learning is more effective for theory courses than practice courses (Kholipah, Arisanty, and Hastuti, 2020; Hikmat et al., 2020).

Next, the department's 'nature' with its competence goal can determine how the course is carried out, whether fully online or online, partly offline. Here it can be stated that interactions between lecturer and students are essential. Even though the situation makes them have an online classroom, they need to make a good interaction to make the qualified learning achieved.

## 2. Appropriate Level of Instructions

The following table shows the score result of the appropriate level of instructions.

<i>Appropriate Level of Instructions</i>	Non-Technic Theory Course	Technic-Theory Course	Technic-Practice Course
Lecturers use useful teaching aids	2.974	3.072	3.184
Lecturers understand the condition of students during learning (physical, mental & emotional conditions)	3.130	3.155	3.164
Avarage score	3.052	3.114	3.174

Total	<b>3.113</b>
-------	--------------

Table 6: The Students' Perspectives on The Appropriate Level of Instruction

According to the result, Technic-Practice Course has the highest score. It can be reached because some departments can fully manage the Practice program online by using engineering software. So, they can use the software as teaching aids. Some of the lecturers have improved their teaching to be able to run entirely online. Some lecturers give mini-projects that make the student think and learn independently to accomplish it in the Practice course. This idea is supported by Hamid et al. (2020), who say that lecturers can use more flexible alternatives with asynchronous online learning to achieve the learning objectives.

Because of the restriction on students coming to campus, the learning method needs to be modified. For example, each student's practice program, usually done five days per week, is scheduled for two days in the workshop. So, the lecturer has to downgrade the learning targets in the practical course. This following year, the students' learning target is not the same as the previous learning target, while it is done five days fully offline. Then, some lecturers modify the practical course content, which they also try to cover literature improvement and knowledge improvement in the subject area in the three-day (online) learning. Some other lecturers give students projects, making them have to use engineering applications that are not the same as the previous years of offline teaching and learning.

It can be stated that the use of teaching media modification can help the learning success. Besides that, downgrading the learning contents seems a logical strategy done by the lecturer in some courses.

### 3. Incentives

The results of the questionnaires concerning the students' perspectives on the incentives can be seen in the following table.

<i>Incentives</i>	Non-Technic Theory Course	Technic-Theory Course	Technic-Practice Course
Lecturers motivate students	3.307	3.087	3.145
Lecturers provide an objective assessment	3.427	3.314	3.435
Lecturers provide opportunities for students to argue and ask questions	3.573	3.478	3.527
Lecturers provide feedback on assignments	3.438	3.063	3.188
Lecturers provide assistance and guidance to student difficulties	3.224	3.116	3.242
Avarage score	3.394	3.212	3.307
Total	<b>3.304</b>		

Table 7: The Students' Perspective on The Incentives

From the data shown in Table 7, the least score was gained by the Technic Theory course. Specifically, in the term "lecturers provide feedback on an assignment." According to students,

they needed feedback on the lecturer's assignment to comprehend the learning material better. Sometimes students do not know which one is the correct job/product/work among the assignment handed since the lecturer does not inform or show the correct/best one to the students. This idea is in line with Simatupang et al. (2020) and Rifiyanti (2020). They argue that online learning is effective if the teachers' readiness, the ability to use applications, the use of proper technology, the quality, and teachers' competence to enhance and encourage learners to engage in the online learning environment are available.

According to students' interviews, the feedback on assignments was already a kind of attention they need from the lecturer. Here the feedback on assignments from the lecturer was a kind of incentive for them. Meanwhile, the lecturer sometimes had difficulties checking all assignments due to limited time. However, some lecturers had a strategy that at least shows or informs the students of the right job.

The biggest challenge for students in online learning was not to control the lecturer as in the actual classroom. It needs students' independent learning, which sometimes is a big obstacle for students if they are not prepared. On the other hand, students felt they are more motivated to learn by doing a two-way communication or learning interaction. Moreover, if the lecturer was more open to students to get a question and assist, they thought it effectively helped them understand the learning material. This situation is in line with Alchamdani et al. (2020) and Febrianto et al. (2020), who state that the adverse effects of online learning are weak student supervision, lack of signal strength in remote areas, high quota fees, and a decrease in students concentration due to the excessive workload. So, it can be said that providing feedback on assignments is also an important aspect that should be paid attention to by the lecturers. Giving motivation directly through words, but incentives for students can be given feedback and assistance.

#### 4. Time

The results concerning the students' perspectives on the time allotted can be seen in the following table.

<i>Time</i>	Non-Technic Theory Course	Technic-Theory Course	Technic-Practice Course
Lecturers use the available time effectively	3.307	3.217	3.193
Lecturers provide sufficient time to do assignments	3.344	3.145	3.188
Avarage score	3.326	3.181	3.191
Total	<b>3.233</b>		

Table 8: Student's Perspectives on Time

According to data shown in Table 8, lecturers, in general, had time effectively and provided sufficient time to do the assignment. The Non-Technic Theory course gained the highest score. The students were asked to do the assignment at a specified time, and the students thought it was sufficient to finish their assignment.

The lecturer can use the available time effectively by having a classroom by using video conference applications. In explaining the subjects, giving feedback, and discussions, the lecturers usually use zoom or google meet. As a polytechnic institution, the students' dan lecturers' attendance is essential in administrative data. So, most lecturers committed to using the allocated time effectively.

However, according to interviews, some lecturers and students admitted that online teaching and learning make it feel as if it is done 24 hours per day, especially in practice programs in which the students were asked to do a project or assignment by using engineering software. They had to download the material and software, which can last for hours, then do the task, and then upload it again, which is sometimes difficult to do, especially in rural areas. Meanwhile, the lecturer said they had to make learning media, edit it, render it, and upload them. Not to mention that they also had to check the students' work, give proper feedback, and give answers to students' questions. Then, of course, each lecturer had to teach many classes that sometimes were simultaneous. This rollercoaster situation is something that they have to do during online teaching and learning. Nevertheless, if the lecturer has made learning media that can also be used in multiple classes, it can make the work easier. This phenomenon is in line with Hamid et al. (2020), who say that lecturers can use more flexible alternatives with asynchronous online learning to achieve the learning objectives.

For students who had to do the practical course in the workshop for two days, the other three days were to make a report and do an assignment. However, students admitted that, actually, sometimes there was still plenty of spare time. They also said that if the lecturer gave the students freedom to manage the time, they could collect the tasks on time. Some lecturers asked the students to give progress reports every day, even 2-3 times per day. Here, the students think they are being supervised, and the advantage for them is that they get immediate feedback on assignments from the lecturer. Besides, they think that it is helpful to discipline themselves.

In theory courses, the lecturers had used the official schedule well. There were not many changes. The situation is similar to the offline learning that they used to have. However, it is hard to do the "course work" for students and lecturers according to the official schedule (from 7 a.m. to 3.20 p.m.) only in an online situation, especially the Technic course.

Based on the discussion above, it can be seen that in three of four categories, the highest scores were gained by the Non-technic Theory. It means students perceived the Non-Technic course as more effective than the Technic course in online teaching and learning. This was also validated in students' interviews.

## **CONCLUSION**

Overall, the findings show that online teaching effectiveness in learning in Polman Bandung is at an adequate level (3.23 of 4). The result implies that the online teaching and learning in October 2020, or seven months of the pandemic, is still at the level of normal condition. It can be caused by the adaptation to online learning. What students need in online teaching is the interaction between lecturer and students. Besides that, giving feedback to assignments is also important to build students' material comprehension. Then, for departments that the competency

does not rely on machine operations, they can execute the online teaching and learning by using media and engineering software. On the other hand, for departments that the competency relies on manufacturing/production machines and workshop tools, they still need an offline workshop session. However, it is done in a rigorous condition: to obey the health procedure and limited time and number of people.

However, this study is done in the first year of online teaching and learning because of the pandemic situation. The situation might be different if it is done in a different academic year. Then, each student only chooses one course/lecturer in different categories, not all courses to be scored by them. So, students' subjectivity may also occur in the questionnaire result. It is suggested that further study is needed to cover a more specific area, for example, in a department, so that it can have the 'macro' picture of the situation that happened.

As practical implications from this study, the lecturer should manage the course to interact better and give students feedback. Furthermore, the institution also needs to empower lecturers to have a better competency to have online teaching.

## **ACKNOWLEDGEMENTS**

The researchers would like to thank Politeknik Manufaktur Bandung for the support to accomplish this paper.

## **REFERENCES**

- Alchamdani, Fatmasari, Anugrah, E.R., Putri, F., & Astina. (2020). The Impact of COVID-19 Pandemic on Online Learning Process in The College at Southeast Sulawesi. *Jurnal Kesehatan Lingkungan*, Vol.12 (1), Special Issue, p. 129 – 136. DOI: 10.20473/jkl.v12i1si.2020.129-136
- Ariyani, E.D., Hadiani, D. (2020). Hubungan Pola Keterampilan Komunikasi Interpersonal dan Prestasi Akademik Mahasiswa. *Jurnal Sosial Humaniora dan Pendidikan (JSHP)*, Vol. 4 (2) p. 141-149.
- Darsono, H., Fitri, A.N, Rahardjo, B., Imanuela, M.Z., Lasambouw, C.M. (2020). Efektivitas Pembelajaran Jarak Jauh Selama Masa Pandemi Covid-19 (Kajian di Politeknik Negeri Bandung). *IRWNS: Proseeding the 11th Industrial Research Workshop and National Seminar*.
- Febrianto, P.T., Mas'udah, S., & Megasari, L.A. (2020). Implementation of Online Learning during the Covid-19 Pandemic on Madura Island, Indonesia. *International Journal of Learning, Teaching and Educational Research*, Vol. 19 (8), p. 233-254. DOI: <https://doi.org/10.26803/ijlter.19.8.13>;
- Hamid, R., SENTRYO, I., & Hasan, S. (2020). Online learning and its problems in the Covid-19 emergency period. *Jurnal Prima Edukasia*, Vol. 8 (1), p. 86-95. DOI:<https://doi.org/10.21831/jpe.v8i1.32165>
- Hikmat, Hermawan, E., Aldim, & Irwand. (2020). Efektivitas Pembelajaran Daring Selama Masa Pandemi Covid-19: Sebuah Survey Online. UIN Sunan Gunung Djati Bandung Tahun 2020, Karya Tulis Ilmiah (KTI) Masa Work From Home (WFH) Covid-19.
- Joesyiana, K. (2020). The Effectiveness of Online Classes During The COVID-19 Pandemic (Case Study: Students Of The Management Study Program Of Persada Bunda). *Media Bina Ilmiah*, Vol. 15 (2), pp 4045- 4056.
- Karlina, S., Nurfaridah, W.O., Lasambouw, C.M., Mathilda, F. (2020). Penerapan Nilai-Nilai Pancasila di Kalangan Mahasiswa dalam Melaksanakan Kebijakan Pemerintah dalam Bidang Pendidikan di Era Pandemi Covid-19. *IRWNS: Proseeding the 11th Industrial Research Workshop and National Seminar*.
- Kemendikbud, Biro Kerjasama dan Hubungan Masyarakat. (2020). Panduan Penyelenggaraan Pembelajaran pada tahun ajaran dan tahun Akademik baru masa Covid 19. <https://www.kemdikbud.go.id/main/blog/2020/06/panduan-penyelenggaraan-pembelajaran-pada-tahun-ajaran-dan-tahun-akademik-baru-di-masa-covid19>

- Kholipah, N., Arisanty, D., Hastuti, K.P., (2020). Efektivitas Penggunaan E-Learning dalam Pembelajaran Daring Selama Masa Pandemi COVID-19. *Jurnal Pendidikan Geografi*, Vol. 7 (2), pp 24-33.
- Limbong, T., & Simarmata, J. (2020). Menentukan Matakuliah yang Efektif Belajar Daring (Belajar dan Ujian) dengan Metode Multi-Attribute Utility Theory (MAUT). *Jurnal RESTI (Rekayasa Sistem dan Teknologi Informasi)*, Vol. 4(No. 2), 370–376.
- Maulana, H.A., & Hamidi, M. (2020). Persepsi Mahasiswa terhadap Pembelajaran Daring pada Mata Kuliah Praktik di Pendidikan Vokasi. *Equilibrium: Jurnal Pendidikan*, Vol. 8 (2), pp 224 – 231.
- Polman Bandung. (2016). *Pedoman Penyusunan Kurikulum Politeknik Manufaktur Negeri Bandung*. Polman Bandung.
- Rachmat, N. (2020). Analysis Of Effectiveness Of Online Learning Pandemic Covid-19 In Prosthetic Orthotic Major In Polkesta. *Jurnal Terpadu Ilmu Kesehatan*, Vol. 9 (2), p. 117-268.
- Ratnawati, D., & Vivianti. (2020). Persepsi Mahasiswa Terhadap Pembelajaran Daring pada Matakuliah Praktik Aplikasi Teknologi Informasi. *Jurnal Edukasi Elektro*, Vol. 4 (2), pp 110 – 120.
- Rifiyanti, H. (2020). Learners' Perceptions of Online English Learning during COVID-19 Pandemic. *SCOPE: Journal of English Language Teaching*, Vol. 05 (01), 31- 35. DOI: <http://dx.doi.org/10.30998/scope.v5i1.6719>
- Rusdiana, E., & Nugroho, A. (2020). Respon pada Pembelajaran Daring bagi Mahasiswa Mata Kuliah Pengantar Hukum Indonesia. *INTEGRALISTIK*, 31(1),1-12
- Sadikin, Ali dan Hamidah, Afreni. (2020). Pembelajaran Daring di Tengah Wabah Covid-19. *Jurnal BIODIK* Vol.06 (2), p.214-224. DOI: <https://doi.org/10.22437/bio.v6i2.9759>
- Simatupang, N.I., Sitohang, S.R.I., Situmorang, A.P., & Simatupang, I.M. (2020). Efektivitas Pelaksanaan Pengajaran Online Pada Masa Pandemi COVID-19 Dengan Metode Survei Sederhana. *Jurnal Dinamika Pendidikan*, Vol.13 (2), p. 197-203. <http://ejournal.uki.ac.id/index.php/jdp> DOI: 10.33541/jdp.v13i2.1754
- Slameto. (2010). *Belajar dan Faktor -Faktor yang Mempengaruhinya*. Jakarta: Rineka Cipta.
- Slavin, R.E. (2009). *Educational Psychology: Theory into Practice*. Pearson.
- Sujarwo, Sukmawati, Akhiruddin, Ridwan, & Siradjuddin, S. (2020). An Analysis of University Students' Perspective on Online Learning in the Midst of Covid-19 Pandemic. *Jurnal Pendidikan dan Pengajaran*, Vol. 53 (2), p.125-137.
- Suprianto, Arhas, S.H., Mahmudin, & Siagian, A.O. (2020). The Effectiveness of Online Learning Amid the COVID-19 Pandemic. *Jurnal Administrare: Jurnal Pemikiran Ilmiah dan Pendidikan Administrasi Perkantoran*, Vol. 7 (2), p. 321-330.
- Suryosubroto. (2009). *Hakekat Inovasi Pembelajaran*. Bandung: Rineka Cipta