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Facilitating students' readiness for blended learning during the COVID-19 pandemic

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ABSTRACT

Blended learning during COVID-19 pandemic creates diverse combination of face-to-face synchronous and asynchronous activities. However, there is still limited exploration on students' readiness in terms of finishing their tasks. Most studies only focus on general description of students' learning preparation. To complete the existing literature, we investigated the use of training, tutorials, and simulations to facilitate students' readiness for blended learning during the COVID-19 pandemic. Three iterative phases of preparation, learning implementation, and investigating findings were employed in a frame of design-based research (DBR) method. The data consists of classroom' observations, students' reflective notes, and students' achievements reports. All data were coded and analyzed statistically and qualitatively to determine the benefits of training, tutorials, and simulations in supporting students' readiness to complete tasks. The results show that training, tutorials, and simulations facilitate extra asynchronous interaction and time to help students prepare their drafts for submission. Students can achieve all predefined learning goals at the end of the semester. The results imply that educators need to explore more initial activities prior blended learning to facilitate students' readiness.

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1. INTRODUCTION

Before the COVID-19 pandemic, blended learning implementation combined classroom offline meetings and online activities [1]–[3]. When schools and universities are officially locked to avoid virus transmission, blended learning concept shifts to the combination of face-to-face synchronous meeting and asynchronous activities [4], [5]. However, there are no robust indicators for designing effective blended learning during COVID-19. One of the challenges in implementing blended learning during COVID-19 is learning diversity. The diversity may include students' background knowledge, motivation, technology access, and learning preferences. As the impact, students' have different learning performance and academic achievements. Teachers tend to select different tools and develop learning based on students' need [6]. Previous studies prove that synchronous is a successful practice, but other studies show that asynchronous activities offer more benefit to students. A study from Malaysia found that synchronous activities gave better academic

results [7]. On the contrary, students in China and USA experienced the benefit of the asynchronous format because they have a stronger sense of community through interacting, discussing, and sharing ideas. The asynchronous format facilitates excellent connectivity, engagement, learning comfort and satisfaction [8]. In line with China and USA, a university in Indonesia also adopted blended learning for asynchronous activities by using Google Classroom platform. Educators mostly used Google Classroom for creating online activities, assignment submission, quiz, and grading [9]. Another study in Indonesian university students showed that asynchronous activities provided flexibility, efficiency, self-care, and self- development [10].

The diversity of students' characteristics results in limited exploration on how to prepare students' readiness in completing their task. Most studies only highlight general description of students' readiness, for example, Rafique *et al.* [11] found that undergraduate students in Pakistan have sufficient motivation and awareness to pursue their study in general. Nevertheless, students at a public university in Melaka have a low level of readiness toward online learning. Interviews with six undergraduate students showed that they were more confident with face-to-face meetings to ensure their understanding [12]. Similar results revealed that undergraduate students in Malaysia have low movement control and self-directed learning. They have helpful literacy toward hardware and software but need help managing their motivation and study monitoring [13]. Students in Jordan preferred online learning for test and accessing material only, meanwhile, they chose face to face to interact with teachers [14]. Agherdien *et al.* [15] revealed that students in South Africa have low learning readiness due to social-economic conditions, academic proficiency limitations, and low levels of motivation. Collado *et al.* [16] added that students who lack learning facilities, motivation, and a conducive learning environment could not perform well. Students with less comfortable feelings toward technology tend to have lower self-efficacy and social communication skills [17].

To fill the literature void, this study offers a novel strategy of blended learning by providing initial activities prior task submission. The concept of blended learning in this study refers to the combination of face-to-face synchronous Zoom Meeting and asynchronous activities through Google Classroom. Teacher provides training, tutorials, simulation, extra consultation, and extra submission time. Students expect to have initial activities before submitting their task to connect activities from synchronous to asynchronous formats [4]. The initial activities include: i) students are allowed to submit the drafts of their task for consultation session; ii) teacher gives extra time to consult the task without limited amount of time. Students can consult their task several times until they meet the minimum requirements; and iii) teacher provides extra time to revise the task until the end of the semester. The teacher makes sure that all students understand the instruction, analyze examples, and consult their task before uploading the final version to Google Classroom. Thus, the main practice of this strategy is letting the students experience the process of learning. The teacher does not demand students to submit the task immediately to reach learning objectives since the condition of students during COVID-19 maybe different based on their demography, technology access, motivation, and other external support system in the family. Therefore, the research question of this present study is: How does the teacher facilitate students' readiness for blended learning through initial activities prior task completion? The practices were conducted during COVID-19 pandemic, but the findings are expected to contribute as one of learning strategies for post COVID-19 pandemic settings.

2. METHOD

2.1. Research approach

The present study employed design-based research (DBR) which focused on facilitating students' readiness in finishing their task. Teacher designs initial activities to assist students to complete assignments. The initial activities include training, tutorial, simulation, consultation, feedback, and revision. The findings describe a teacher's efforts in nurturing learning process in blended learning settings [18]. The design is expected to promote assignments as a process of learning, not only a way to pass a course or achieve good grades. This study offers multi findings: learning activities, students' reflection, and students' academic achievements. The emphasis of the findings is on learning activities and students' reflection. Students reflect their experience in completing the task and gain other psychological effects during the semester. Thus, the design includes personal development into future consideration [19] and promoting future adoption of the design [20]. Although the setting of the course was blended learning during COVID-19, but the findings and implication hopefully contribute to blended learning post COVID-19.

2.2. Participants

The participants of this research were undergraduate students from one of English Language Education Department in a private university of Indonesia. There were 44 first-year students (17 males and 27 females) who enrolled in information and communications technology (ICT) in education course. The participants were selected purposefully to meet research objectives. Purposive technique sampling is suitable

for this research because the research focus on implementing new learning strategy, therefore, the data presents deep investigation toward individuals in the classrooms [21]. In addition, all participants were freshmen who started new college life. They need specific learning assistance during the adaptation process.

2.3. Procedures and instruments

ICT in education course is an introductory course on ICT integration into learning. This 3-credit course had 14 meetings in one semester. At the end of the course, students are expected to build awareness toward ICT utilization to facilitate learning. The teacher conducted DBR protocol which consists of initials activities prior assignments submission and iterative monitoring phase. The DBR adapted the iterative DBR process from Wang [22]. The phases include i) the preparation phase; ii) learning implementation; and iii) integrating findings from phase 1 and phase 2 as displayed in Figure 1. However, Wang [22] aimed to improve the theory and practice of the course, meanwhile this study improves practice and promotes personal development.

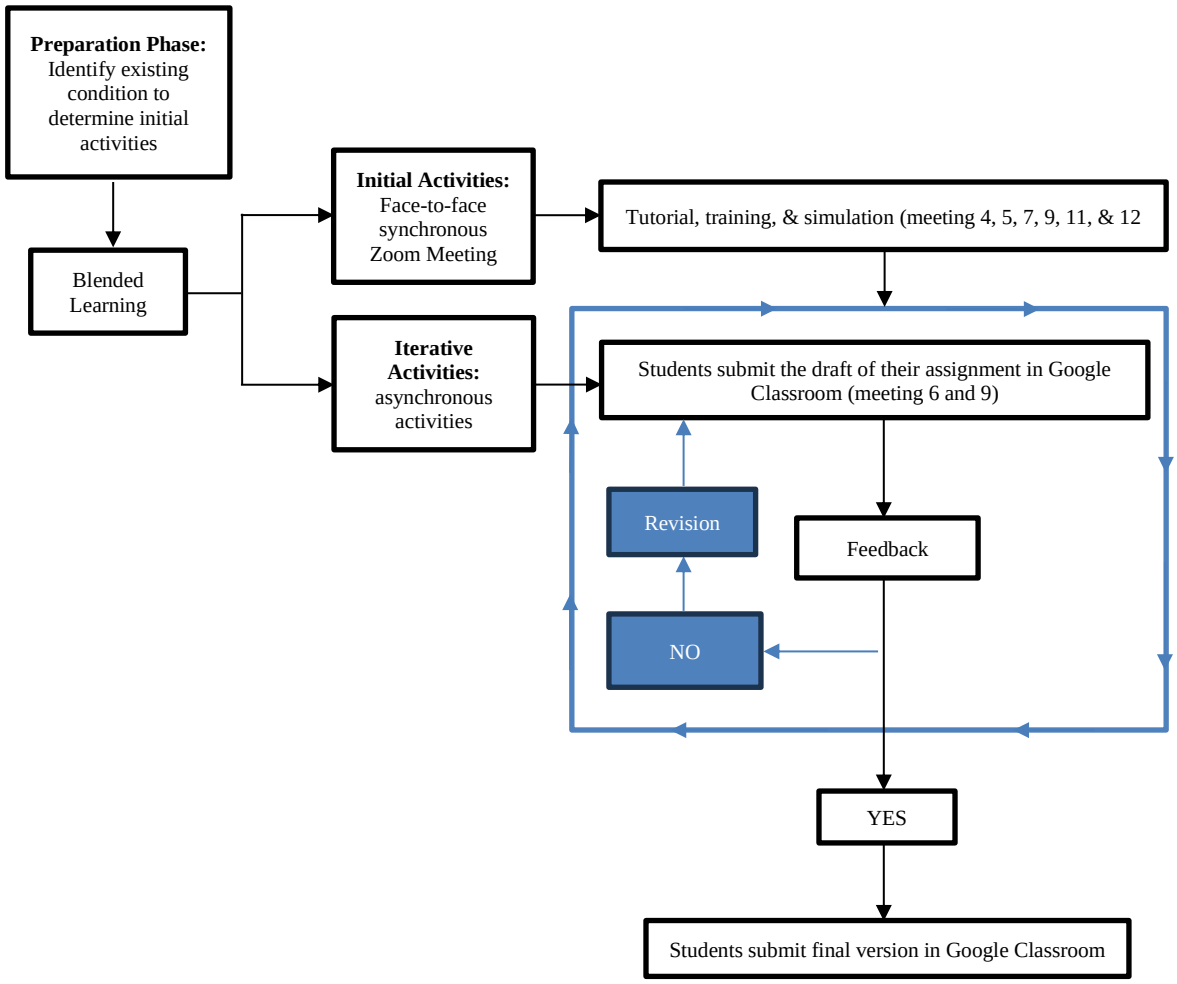

Figure 1. DBR protocol for blended learning setting

There were two strong offers in this design: i) tutorial, training, and simulation prior task submission to ensure students' understanding toward the task; and ii) iterative monitoring section which allowed students to revise their task several times in a flexible allocation time. The design created a loop of learning process. The tutorial described the assignments in general, followed by training and simulation to give examples. Each group was expected to meet the criteria of indicators in rubrics to achieve learning objectives. Therefore, they were required to validate their work to the teacher prior submission completion. The teacher only approved the final version of assignments after consultation and revision session. For those students who did not conduct consultation and revision session, were not allowed to submit final product. This technique was beneficial to students in terms of preventing failure since the teacher monitored students' participation during the semester.

2.4. Data collection and analysis techniques

Prior to the data collection process, the design and instruments were validated by instructional design experts. The experts were assigned by the department and directorate of academic development from the institution. The validation process was a part of revising and reformulating the new curriculum. The validation focused on the alignment of design with institutional regulation, curriculum, learning objective, and research methodology. Empirical evidence was collected through classroom observation, students' reflective notes, and academic performance. Observation notes help teacher to observe learning activities in details [23], therefore, teacher can provide the correct assistance for students. Classroom observation was conducted by watching Zoom Meeting videos of meeting 4, 5, 9, 11, and 12 and monitoring Google Classroom activities. Classroom observation results were coded based on components and subcomponents to determine students' participation as presented in Table 1.

Table 1. Observation protocol

Platform	Components	Subcomponents
Zoom Meeting	Learning participation	Opening camera during Zoom Meeting
		Asking question
		Confirming information
Google Classroom	Learning activities	Submitting assignments
		Receiving feedbacks

Students' reflective notes investigated deeper toward students' personal development during blended learning in one semester. Students wrote their reflections as a part of their final test. They were required to write 500 word-learning reflections and opinions about the use of technology for learning. They could quote at least one reference to support their work. The exact reflective prompt is as: "Reflect your learning process in one semester by explaining your opinion about the use of technology in learning English. Please, remember that you need to combine your opinion with at least ONE resource from the internet. Write your reflection shortly in approximately 500 words. Do not forget to mention your reference. Read the rubrics for clear indicators." Further, following Stein and Graham [1], the data from students' reflective notes were analyzed using codes based on nine components of effective blended learning: i) course goals and learning outcomes (CGLO); ii) ease of communication (EC); iii) pedagogical and organizational design (POD); iv) engaged learning (EL); v) collaboration and community (CC); vi) assessment and feedbacks (AF); vii) grading (G); viii) ease of access (EA); and ix) preparation and revisions (PR). Students' academic achievement was obtained from assignments 1, 2, and 3. The grading system referred to university standards, validated by the directorate of academic development. In addition, the assessment also referred to validated curriculum in the department which states that students need to achieve minimum Grade B (65-69.99) to pass the course. Pertinent to students' academic performance, the data were analyzed using descriptive statistics technique as shown in Table 2.

Table 2. Validated assessment rubrics

Scales	Grades
85.00–100	A
80.00–84.99	A-
75.00–79.99	A/B
70.00–74.99	B+
65.00–69.99	B

3. RESULTS AND DISCUSSION

This section discusses the empirical data about teachers' efforts in building students' readiness before completing their assignments. The findings are presented based on three iterative phases: i) preparation; ii) learning implementation; and iii) integrating findings.

3.1. Phase 1: preparation

Training, tutorials, and simulation for first-year undergraduate students were designed based on some considerations, such all meetings were delivered online due to the pandemic lockdown; students who enrolled in the course were freshmen. Therefore, they may have diverse ICT literacy and technology access since they come from different demographic situations. There were diverse claims on indicators for designing effective blended learning during COVID-19. Several previous studies were convinced that synchronous modality might

benefit blended learning. However, other studies present opposite findings which emphasize the advantages of asynchronous modality. The decision of choosing learning mode depends on the settings and context, and there are limited findings which highlight students' readiness in completing assignments. Most studies only show general description of students' characteristics such as motivation and academic achievements. Based on some circumstances, it is essential to explore more findings on how to facilitate students' readiness in blended learning settings.

3.2. Phase 2: learning implementation

Learning implementation specifically discusses the blended learning protocol which consists of face-to-face synchronous Zoom Meeting for training, tutorial, and simulation, and asynchronous Google Classroom activities. Prior conducting assignment 1, the teacher provided Zoom Meeting to share about the roles of technology in learning (meeting 2), essential components of using technology for learning (meeting 3), and various kinds of learning media (meeting 4). After gaining foundation knowledge about technology for learning, students were assigned to identify the strengths and weaknesses of utilizing technology in learning. They were required to mention a minimum of three strengths and three weaknesses and propose a solution to overcome the weakness. Regarding resources, they were allowed to cite some reading resources to support their opinion. The teacher gave training in meeting 4, meanwhile tutorial and simulation were presented in meeting 5.

Assignment 2 was given in the ninth meeting, and the students were required to select one suitable digital resource for learning. They needed to mention at least three media for learning inside or outside the classrooms. They also wrote the rationales for choosing those media based on fundamental social values in Indonesia and Islam. For example, they choose traditional dance as a medium for learning. They had to explain the rationale for choosing dance as the media to support learning. To support their rationale, they used some valid references. To ensure their understanding of the assignment, the teacher gave training in meeting 9. Tutorials and simulation were given in meeting 11. The last assignment was observing teacher's strategies for using technology in the classroom. Students analyzed a video to describe teacher's procedures in utilizing technology during the lesson, analyze the positive impact of the technology to support students' learning, and provides a suggestion for the teacher to improve the benefit of the technology to maximize learning. The training, tutorial, and simulation for assignment 3 were conducted in meetings 11 and 12.

Prior to each submission, students consulted their task to the teacher. Each student had a different cycle of consultation. Some students only needed one consultation, revision, and final submission. However, other students consulted more than once, revised several times, and submitted late. Teacher did not punish the students who used extra time, considering diverse condition during COVID. In fact, the teacher gave more consultation sessions. Teacher waited until the very end of the semester to ensure all students submitted all assignments. The emphasize of blended learning protocol was the process of monitoring. The teacher paid attention more to the process of consultation and revision to build students' learning readiness. By providing flexible learning, students could personalize their learning pace based on their own condition at home.

3.3. Phase 3: integrating findings

3.3.1. Observation

Observational notes were conducted in meetings 4, 5, 9, 11, and 12. The observation covered the description of Zoom Meeting, especially training, tutorial, and simulation for assignment 1, 2, and 3. The training was started in meeting 4 by explaining timeline, task objectives, and assessment rubrics for assignment 1. In meeting 5, the teacher showed how to find valid and relevant information to support their opinion. In addition to it, the teacher also provided examples of how to cite references in the correct format. The next practices continued to the Zoom Meeting 9, which involved training on formulating rationales to select the right information based on Indonesia's culture or Islamic values (assignment 2). In this assignment, students were expected to select media wisely based on the condition of social culture, demographic, and religious values. The last tutorial was in meeting 11 and 12 for assignment 3. The teacher opened YouTube to show some reliable videos to be observed. Most videos were taken from teachers' teaching practices in junior and senior high schools in Indonesia. The teacher described the video as an example of how to analyze teacher's procedures for using technology in the classroom. The observation tally was described in Table 3, covered the results of meeting 4, 5, 9, 11, and 12.

Based on the observation results in Figure 2, there was limited interaction during face-to-face synchronous Zoom Meeting. There were 18 students who opened their camera in meeting 4. Unfortunately, the total number decreased in the next meeting. Most students chose to close their camera in meeting 5, 9, 11, and 12. In addition, there were only five students who asked questions (meeting 4 and 9). There was no student who confirmed information or materials. Thus, the teacher offered additional interaction through Google Classroom.

Figure 3 describes students' participation in submitting assignments to Google Classroom and receiving feedback from the teacher. Most students submitted their assignments, however, the interaction mostly occurred during assignments 1 (52%) and 2 (44%). In assignment 1, there were 12 students who responded to feedback and two of them asked questions to confirm their understanding. Meanwhile, there were 10 students who responded in assignment 2 and there was only 1 student who responded in feedback assignment 3 (4%). Google Classroom as an alternative interaction could not maximize mutual interaction.

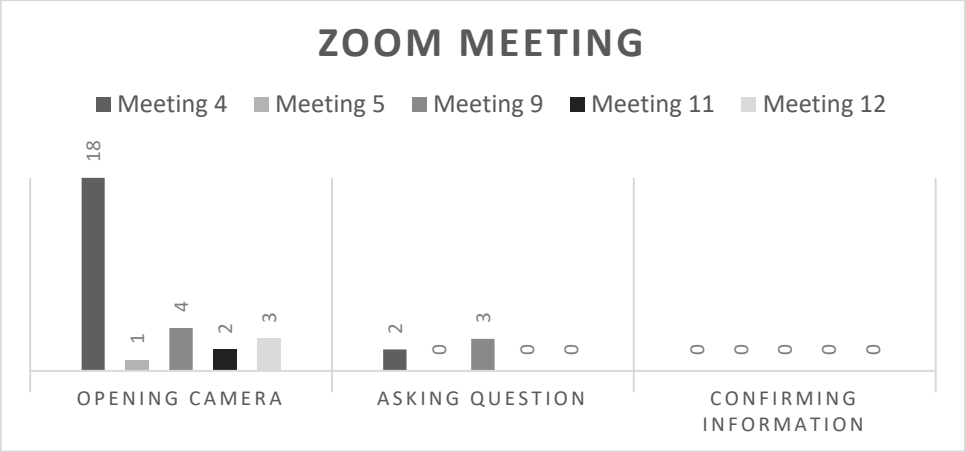

Figure 2. Learning participation

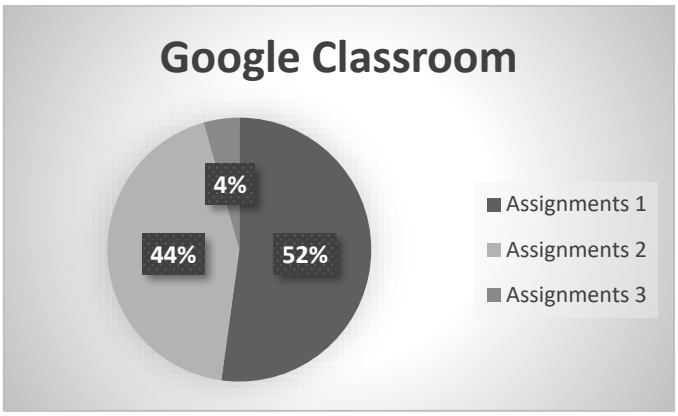

Figure 3. Learning interaction

3.3.2. Students' achievement

Students' achievements were obtained from the accumulation of assignments 1, 2, and 3 as presented in Table 3. Teacher graded students' work based on the revision version after consultation session. Thus, the teacher ensured that the task submission is final. In addition, the teacher also gave additional time for some students who needed extra time to submit the final revision. This technique was beneficial for students since all students could pass the course.

Despite limited interaction in Zoom Meetings and Google Classroom, most students achieved the score requirement as presented in Table 4. Most students could achieve Grade A (85-100) and A- (80-84.99). There was significant improvement in the score's intervals. In assignment 1 and 2, some students still obtained Grade A/B (75-79.99), Grade B+ (70-74.99), Grade B (65-69.99), Grade B- (60-64.99). In assignment 3, there was no student who got lower than 75.

However, the total number of students who did not submit the assignment increased from 5% in assignment 1, 11% in assignment 2, and 16% in assignment 3. Based on administration data, it was found that 1 student discontinued his education, 1 student admitted that he had to take part time job due to financial constraint during COVID. Meanwhile, the rest of the students did not notify the teachers regarding submission, consultation, and revision.

Table 3. Assignments

Assignment	Description
1	Making a list of positive and negative impact of technology in learning
2	Selecting one digital resource based on Indonesian culture and Islamic value
3	Observing a learning video to analyze teacher's strategies in using technology to support learning

Table 4. Academic achievements

Components	Total number						
	A	A-	A/B	B+	B	B-	No submission
Assignment 1	24	7	2	3	1	5	2
Percentage 1 (%)	55	16	5	7	2	11	5
Assignment 2	24	8	3	3	1	0	5
Percentage 2 (%)	55	18	7	7	2	0	11
Assignment 3	13	21	3	0	0	0	7
Percentage 3 (%)	30	48	7	0	0	0	16

3.3.3. Students' reflection

Students wrote their learning reflection as a part of their final test. They highlighted their experience in joining the course and their opinion toward technology for learning, there were 39 notes, coded based on nine components of blended learning: i) CGLO; ii) EC; iii) POD; iv) EL; v) CC; vi) AF; vii) G; viii) EA; and ix) PR [1]. One student may write more than one response to represent more codes. Therefore, the recapitulation of responses is varied based on students' reflection as presented in Figure 4.

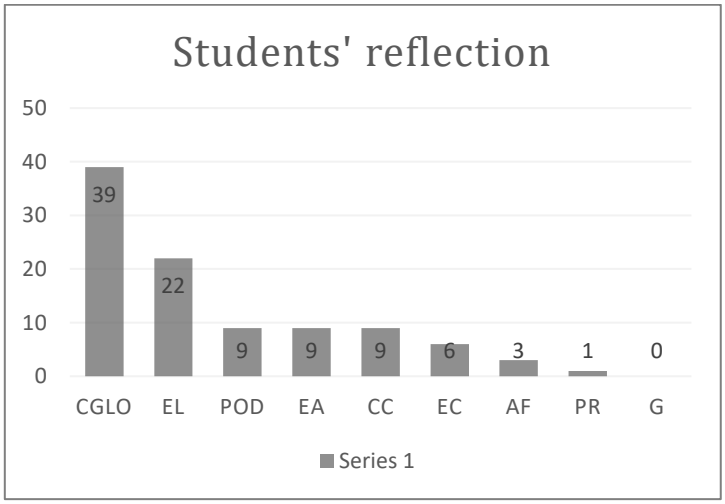

Figure 4. Students' reflection

The results show that most students have positive reflection toward training, tutorial, and simulation. Blended learning protocol helped them to achieve learning goals (CGLO-39 students). They also received iterative learning engagement (EL-22 students) which improved their knowledge and personal performance. A participant perceived that, "*I can use technology better, manage time well, be more productive, be active, and complete the assignment earlier…*". Some students relied on syllabus, lesson plan, and tutorials to provide detailed explanations about the assignments (POD-9 students). In addition, they could access Zoom recording in Google Classroom to review the training, tutorial, and simulation (EA-9 students). A participant admitted that "*…the lecturer always gives me the material well….*"

There were seven students who mentioned the benefit of collaboration and communication (CC) to assist them in understanding the materials and finishing their tasks. The participants suggested that teachers and students use technology and analog learning environment to reduce limitations. Another participant stated that, "*do not let us depend on technology; we also need lectures and teachers to share our thoughts…*". Interaction among peers and teachers is still one of the essential keys in blended learning. Other students added that easy-to-follow tools and learning management system supported active participation (EC-6 students). Meanwhile, other components, such as assessment and feedback (AF-3 students), preparation and revisions (PR-1 student) and grading (G-No response), showed limited responses.

Blended learning protocol, powered by initial training, tutorial, and simulation presents theoretical and practical value for students' learning. Theoretically, they are aware of technological integration into learning. Most students state that technology is vital to learning and the future. They firmly believe that technology empowers learning by providing various information and tools to support learning. A participant highlights that "*…the most important thing is how teachers can actively explore student potential and utilize information to achieve learning goals…*". Meanwhile, another participant adds, "*Technology can be positive and negative. It depends on how we use it…*". Practically, they build personal performance through asynchronous learning. Asynchronous iterative monitoring prior task submission supports the revision process. Students revised their work based on feedback. Some improvements include resources selection, citation, rationalization, problem solving, paraphrasing, and analysis.

The findings confirm that blended learning preparation is essential, especially for freshmen. The interaction can be varied since they need a transition phase from senior high school to university life. They also need time to build trust with teachers and peers. The form of learning community affects their reaction toward materials delivery, assignment's instruction, consultation, and revision. Previous studies agree with these results. The preparation of reliable learning resources significantly affects students' technology acceptance [24]. In addition to it, students' characteristics, computer literacy, self-efficacy, perception, attitude, and behavior also contribute to the success of online learning [25]–[27]. It aligns with a study by Tang *et al.* [28] which mentions self-directed learning, motivation, learner control, and online communication as significant factors in online learning. Teacher needs to elaborate preliminary data toward students' need to facilitate the proper preparation.

Initial activities prior to blended learning can be a potential teaching strategy to empower blended learning post COVID 19. Several studies support the sustainability of blended learning in higher education. Blended learning can be a solution for a learning pattern in university for post pandemics learning due to its positive acceptance among educators [29]–[32]. Therefore, Zuhairi *et al.* [33] suggest that institutions design learning support to complement online learning, such as academic and administrative services. Moreover, they point out some examples of university services, such as tutors, learning resources, and support centers [33]. It is essential to prepare better infrastructure to strengthen blended learning implementation post COVID 19 pandemics [34]. They mention several important supports such as mental health assistance, additional pedagogical training on teaching methods, technology integration and learning quality assurance to ensure learning improvement. Dynan *et al.* [35] recommend the integration of self-directed learning in some courses in the curriculum to empower students' learning preparation.

This study offers practical contributions, especially teaching techniques in blended learning setting. The strength of the protocol is providing initial training, tutorial, and simulation prior to each task submission. In addition to it, the teacher also assists students' progress by giving specific and iterative feedback. As the impact, the teacher is able to facilitate students' readiness in finishing assignments and developing personal performance. However, the design still needs improvements in terms of building synchronous interaction among freshmen. Previous studies suggest that successful interaction in blended learning depends on several factors such as clear instruction, learning modalities, sustainable active learning, task engagement, and resources diversities [18], [36], [37]. Since this study specifically assists students in completing their assignments, the improvement may focus on creating engaging tasks to promote synchronous interaction. A study show that students value interactive tasks and pre-session activities to prepare face-to-face interaction [38]. Interactive tasks can be in the form of classroom discussion, real time video meeting, and quiz [39]. In the context of freshmen college student, a study utilizes motion graphic design to gain students' attention at the beginning of blended learning implementation [40]. Several future considerations for further exploration may involve task modification and iterative interaction in blended learning environment.

4. CONCLUSION

Based on the results, the iterative phases in blended learning can facilitate students' readiness to finish their assignments. Training, tutorials, and simulation provide more asynchronous interaction and additional allocation time to write their drafts before submitting the results. Some students improved their work in response to teacher criticism, enabling them to meet their learning objectives. The interaction enables them to comprehend the readings and complete their assignments. In summary, most of them have met their learning objectives. Despite the limitation of sampling, the findings show promising applicable learning strategies for blended learning in higher education. Future implication for post COVID-19 pandemic learning is exploring more preliminary activities prior blended learning. It is essential to ensure students' readiness to anticipate the diversity of learning context.

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