STUDENTS' PERCEPTION OF BLENDED ONLINE LEARNING DESIGN BASED COLLABORATIVE LEARNING MODEL AND ITS IMPACT ON LEARNING OUTCOMES

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Abstract

Collaborative learning is an important learning strategy applied to both face-to-face and distance education to build collaboration skills of students. Although collaborative activities in online learning are more complex, with a proper instructional design it would work well. One way to maximize the use of online collaborative learning is by implementing a combination of asynchronous and synchronous online learning which allows for better interaction and communication amongst students and between students and tutors. The research on collaborative learning models based on a combination of asynchronous and synchronous online learning called Blended Online Learning Design based Collaborative Learning Model (BOLD-CLM) aimed to analyze the role of the model (i) to analyze student perceptions in developing cooperation, improving communication, and satisfaction; and (ii) to analyze the effect of the model on student learning outcomes. This quasi-experimental research included an experimental group and a control group in the online tutorial for the Marketing Management Course in Universitas Terbuka Indonesia. A questionnaire using a Likert scale from strongly agree to strongly disagree is distributed to respondents to extract information related to the role and perceptions of respondents towards the BOLD-CLM. Respondents' perceptions of the BOLD-CLM in the aspects of communication and teamwork and student satisfaction showed positive results. The results of the Mann-Whitney test showed that the score of the assignments between students who took the tutorial with the BOLD-CLM (Experiment Group) and students who took online tutorials with standard online learning (Control Group) differed significantly (.000). It can be concluded that collaborative learning in the BOLD-CLM has a significant effect on students' abilities in achieving learning competencies. The results of the Mann-Whitney test showed that the final scores of the courses between students who took the tutorial with the BOLD-CLM (Experiment Group) and students who took the tutorial with standard online learning (Control Group) differed significantly (.026). Thus, it can be concluded that BOLD-CLM has a significant effect on the learning outcome.

Keywords: blended online learning design, asynchronous online learning, synchronous online learning.

1 INTRODUCTION

Collaborative learning is an important learning strategy applied to both face-to-face and distance education to build collaboration skills of students and student's higher order thinking abilities. However, the characteristics of collaborative learning in face-to-face and distance learning are different. Collaborative activities in face-to-face meeting seem to be easier than remotely using online communication. Although collaborative activities in online learning are more complex, collaboration skills in online learning can be applied to create knowledge, discover, and explore an innovation, and look for concepts needed to solve problems (Harasim, 2012). Designing collaborative learning in distance education using online learning requires certain efforts and strategies. The Universitas Terbuka Indonesia as a distance education university, has been utilizing asynchronous online tutorials since 2004, but has not integrated them with collaborative learning models. Online collaborative learning requires its own design, both in terms of material preparation and designing collaborative group discussion forums, and general discussions for the whole class.

Based on R&D research related to collaborative learning on asynchronous online tutorials at the Universitas Terbuka, respondents stated that collaborative assignments are useful including being able to share ideas and experiences among group members (Padmo, Sastro, & Budiastra, 2020). Although asynchronous online collaborative learning provides positive value for students, there are also obstacles. From the aspect of using technology in online learning, Disbrow (2008) mentioned that in asynchronous online learning, the interactions in discussion forums that occur are not spontaneous. In doing online collaborative assignments, students found difficulty in communicating with others by only using asynchronous communication (Padmo et al., 2020). With the development of technology and

communication today, synchronous online learning is possible (Schullo, 2005). This is consistent with research conducted by Cogburn and Levinson (2003) regarding the use of virtual seminars that support asynchronous discussion, which shows that most students (54%) prefer more synchronous interactions.

Larramendy-Joerns & Leinhardt (2006) argues that integrating synchronous communication in online learning is highly recommended. Synchronous communication in online learning also greatly supports the constructivism learning process which is known to be more student oriented (Bangert, 2010). The combination of synchronous and asynchronous online learning allows for good interaction and communication amongst students and between students and tutors. Demsey and Van Eck (2012) suggest that online learning can be done synchronously or asynchronously or a combination of both, which allows students to interact through a Learning Management System (LMS). Several other research results also show that communication in synchronous online learning through web conferencing allows direct communication, which is better at accommodating spontaneity and interaction (Martin & Parker, 2014).

Based on several studies, online learning that combines synchronous and asynchronous communication known as Blended Online Learning Design (BOLD) has potential in helping the online learning process become more effective. The use of BOLD can accommodate three essential learning activities, namely individual, team, and group activities (Power & St-Jacques, 2014). It is further argued that compared to face-to-face learning, with online learning and blended learning, students and lecturers get higher satisfaction from the application of BOLD in terms of the quality of the synchronous components.

According to Power & St-Jacques (2014), online learning that implements BOLD webinars includes three important types of learning activities, namely: Individual, Team, and Group (group). Individual and team activities are conducted prior to the webinar, while group activities are carried out during the webinar. With individual activities, students are assigned to read and take notes and produce three products, namely questions, reflection on results, and critique. The results are then posted on an online forum. In team activities, students in each team discuss individual work results and produce two or three team products. The team's results are posted on an online forum. Communication within the team can be carried out through various media depending on the student, to complete the assigned task. Group activities include presenting team results, receiving comments from other teams, and receiving comments from lecturers, for example, clarifying certain aspects, explaining differences, and or conveying learning resources for the next reading. Collaborative learning design by applying BOLD can of course be done in various ways based on needs.

Based on the results of research on collaborative online learning using asynchronous and synchronous online learning, this research study is aimed to explore on how the postgraduate students at Universitas Terbuka Indonesia perceive the use of blended online learning design based on collaborative learning model (BOLD-CLM) and its impact on learning outcomes.

2 METHODOLOGY

This research is a quasi-experimental research with a sample of all online tutorial classes in the Marketing Management course in second semester of 2020 in Universitas Terbuka, consisting of six classes. Of the six Online Tutorial classes, three classes have become the experimental group and three classes, the control group. The Blended Online Learning Design based collaborative learning model (BOLD-CLM) is applied to three experimental classes, namely EKMO5206.01, EKMO5206.02, and EKMO5206.05. Meanwhile, the other three classes, EKMO5206.03, EKMO5206.04, and EKMO5206.06 are the control group that takes online learning without adopting the BOLD-based collaborative learning model. The total number of student samples in this study are 66 students in the experimental group, and 71 students in the control group.

The research procedure in the experimental group was carried out in accordance with the implementation stages of the BOLD-CLM. The group assignment for the experimental group was a project related to marketing management. Each Team has an assignment with the same content and scope. However, each team has followed a different case. The company chosen as the project for each team has a proper and complete website from various types of businesses, such as fashion, food/beverage, cosmetics, furniture, and shoes. Group assignments are designed to be carried out by each team in three stages, namely Task 1, Task 2, and Task 3.

In conducting the research, the formation of student groups was carried out before the tutorial class had started. In the experimental group, each class was divided into 5 teams, and each team was assigned

to work on a specific project according to the learning design. To work on collaborative assignments, the experimental group was given a team discussion facility in the form of an asynchronous online discussion forum. The discussion forum for each team was held in Session 4 (Task 1), Session 7 (Task 2), and Session 10 (Task 3/Group Report), labeled by a specific team name.

In the experimental group, apart from the collaborative tasks, they were also required to attend synchronous online meetings which were held 4 (four) times during the tutorial sessions, namely in Session 3, Session 6, Session 9, and Session 12 using the Microsoft TEAMS application.

In the control group, the students used a standard online learning model which provided asynchronous online learning facilities which included individual assignments and general discussions for all students. The assignments given to the experimental group and the control group were the same in terms of content and scope. The difference was in the way the students did their assignments. For students in the experimental group, the assignment was done collaboratively as a team, while in the control group the task was done individually.

The questionnaire used a Likert scale to measure respondents' perceptions in developing cooperation and improving student communication as well as measuring student's perceptions in implementing the BOLD-CLM. A Likert scale was used with strongly agree, agree, not believe, disagree, and strongly disagree. In addition, data collection was also carried out through focus group discussions (FGD) using semi-structured interview guidelines.

After the implementation of the BOLD-CLM, students/participants from the experimental group were asked to fill out an online questionnaire to obtain information related to their perceptions and satisfaction of the model. In addition, qualitative data were obtained through observation and focus group discussions. Focus group discussions with the participants in the experimental group was carried out by synchronous online meeting using the TEAMS application. Meanwhile, the discussion scores, the assignment scores, and the final grade scores from the experimental group and the control group were obtained from the documentation of learning outcomes assessment. To see whether there was a significant difference between the experimental group and the control group in terms of discussion scores, assignment scores, and final course scores, the Mann-Whitney test, which is a non-parametric test for comparison of two data groups, was used.

3   RESULTS

3.1   Student's Perception of Blended Online Learning Design Based Collaborative Learning Model

3.1.1   Student's Perception on Synchronous Online Tutorial

The study results on the student's perceptions on the role of the BOLD-CLM in terms of the used of synchronous meeting are showed in the following Table 1.

Table 1. Students' perception on the role of BOLD-CLM in terms of synchronous meeting

Questions	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree	Total
Synchronous meeting helps the learning process.	43.10%	44.83%	6.90%	1.72%	3.45%	100%
Group Task Presentations are more appropriate at the synchronous meeting	22.41%	55.17%	12.07%	6.90%	3.45%	100%
Tutors motivate you to study at synchronous meetings.	39.66%	50.00%	6.90%	0.00%	3.45%	100%
The interaction between tutors and students took place smoothly at the synchronous meeting	31.03%	51.72%	12.07%	3.45%	1.72%	100%
Synchronous meeting needs to be continued every semester	32.76%	44.83%	17.24%	1.72%	3.45%	100%
Enjoy following synchronous meeting	36.21%	44.83%	15.52%	1.72%	1.72%	100%
Synchronous meeting activities are useful in helping you understand course material	31.03%	53.45%	12.07%	1.72%	1.72%	100%

Respondents' perceptions related to the use of synchronous meetings showed that most respondents agreed and strongly agreed with the use of synchronous online meetings as part of online tutorials. This suggests that synchronous online is a potential learning model used for UT Post-Graduate programs. This is consistent with research conducted by Cogburn and Levinson (2003) regarding the use of virtual seminars that support asynchronous discussion, which shows that most students (54%) prefer more synchronous interactions. This is in line with the study conducted by Murphy, Rodríguez-Manzanares and Barbour (2011) that emphasized the purpose of using synchronous online tutorials is to provide opportunities for learners to socialize and interact with tutors or other learners.

It is further argued that the synchronous online learning environment is considered positive because of the interactions among students and interactions between students and tutors. Interaction with tutors take place during the question-and-answer sessions and when tutors provide real examples and other activities such as discussions, case studies, and information. The results of this study also strengthen the study conducted by Martin and Parker (2014) that synchronous online learning, via web conferencing, allows direct communication and is considered better in accommodating spontaneous interactions.

3.1.2   Benefits, Constraints, and Preferences on Frequency, Learning activity of Synchronous Sessions

Regarding the benefits of attending the synchronous online tutorial sessions, the data shows that 83% of respondents stated that they could communicate with tutors, 69% stated that they could meet classmates, 69% stated that they could have discussions, 67% of respondents stated that they had new insights, and 47% felt motivated (see Fig.1). The data is also supported by the results of the FGD where the respondent stated several advantages in following synchronous online tutorials, such as having more interest in discussing and doing assignments with other students, having more interest in the learning process, and getting more familiar and closer to the tutor/lecturer.
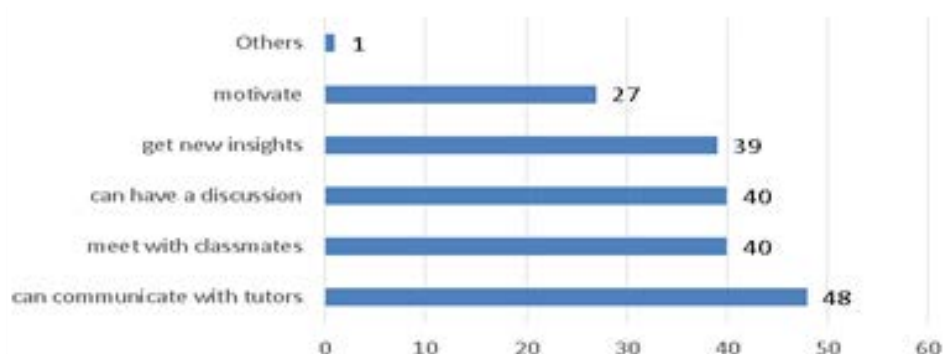

Figure 1. Benefits of synchronous online tutorials

These results in line with several other research which show that the communication in synchronous online learning through web conferencing allows direct communication, which is better at accommodating spontaneity and interaction (Martin & Parker, 2014). Tolu (2010) also argues that higher interaction is possible through synchronous communication in online communities which was initially used for more asynchronous communication. The data in Fig. 1 is also supported by the results of the FGD where the respondent stated several advantages of synchronous online tutorials, such as having more interest in discussing and doing assignments with other students, having more interest in the learning process, and getting more familiar and closer to the tutor/lecturer.

In terms of constraints in attending the synchronous online tutorial sessions were quite varied. The data shows that 67% of respondents felt that they had problems with Internet connection, 57% had time constraints with following synchronous Online Tutorials, 14% of respondents experienced problems with getting permission from work, 7% experienced technological problems, and 5% experienced problems with computers (see Fig. 2). In the FGD, another obstacle emerged in attending the synchronous online tutorial, with costs involved in accessing Internet connection.
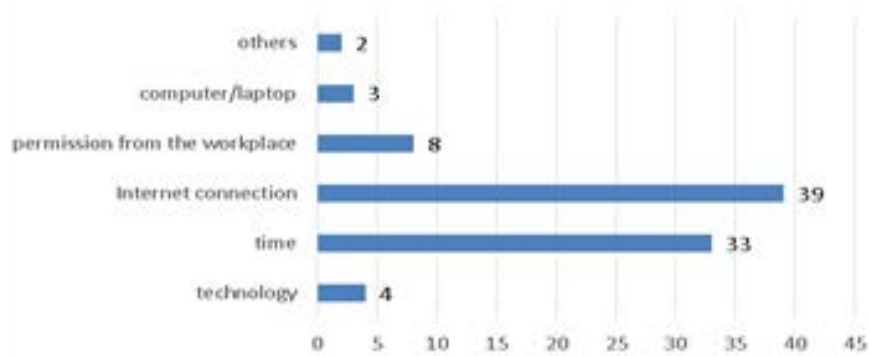
Figure 2. Constraints in attending the synchronous online tutorials

Regarding the number of synchronous online meetings that should be held for each course, the data shows that most respondents (45%) stated that synchronous meetings were held 4 (four) times per course per semester, while 28% stated 6 (six) times per course per semester. But interestingly, there were also 7% of respondents who stated that there was no need for synchronous online tutorials (tutorial webinars, aka *Tuweb*). This shows that there are differences in respondents' opinions regarding synchronous use of online tutorials.
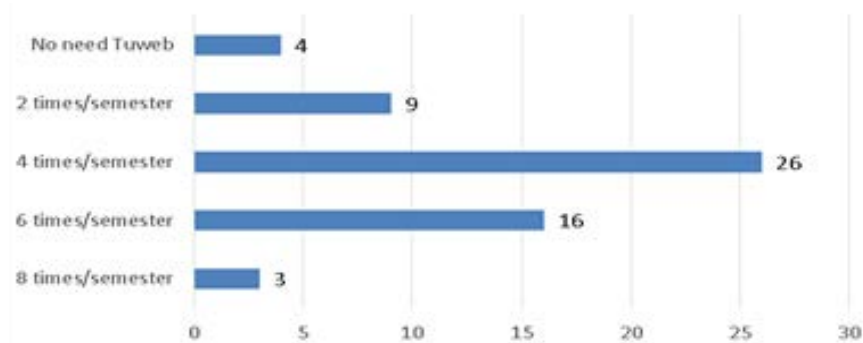

Figure 3. Frequency of Synchronous Online Tutorials

Based on FGD participants agreed that 4 out of 12 online sessions in each semester seems to be appropriate to be delivered by synchronous online meeting considering UT's students are mostly working people. This result confirmed the study conducted by Murphy, Rodríguez-Manzanares and Barbour (2011) that teaching synchronously may be difficult to be applied in distance education since the students may have completely different timetables. However, the participants of FDG mentioned that the synchronous meetings able to fulfill their need to interact with fellow students and tutors.

Regarding the type of activities carried out at synchronous online tutorial, Fig. 4 shows 31% of respondents prefer tutor's presentation, 28% with students' presentation, 24% with discussion, and 10% with question and answer between tutors and students.
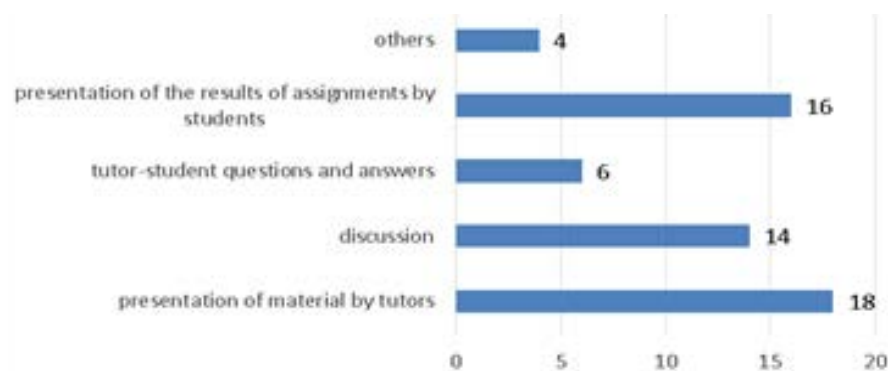

Figure 4. Learning activities in synchronous online tutorials

These results indicate that the item, "presentation of material" from tutors during synchronous online meetings is still dominant.

3.1.3 Students' Perception on Collaborative Learning

The collaboration carried out by students in the online tutorial process begins when each team in the experimental group is asked to discuss targets and work mechanisms for discussing and completing tutorial assignments. The study results on the student's perceptions on the role of the BOLD-CLM in terms of the used of collaborative learning are showed in the following Table 2.

Table 2. Students' perception of collaborative learning of the BOLD-CLM

Questions	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree	Total
Team discusses the target and mechanism of teamwork	29.31%	53.45%	10.34%	5.17%	1.72%	100%
Team has a strategy in doing teamwork.	31.03%	53.45%	10.34%	3.45%	1.72%	100%
Communication between Team members runs well during the Task	24.14%	50.00%	20.69%	3.45%	1.72%	100%
Team members are free to express their opinions	37.93%	51.72%	8.62%	0.00%	1.72%	100%
Team members do their part assignments with pleasure	27.59%	46.55%	22.41%	1.72%	1.72%	100%
Team members give opinions to achieve quality teamwork	31.03%	53.45%	13.79%	0.00%	1.72%	100%
Team Decisions are joint decisions	44.83%	46.55%	6.90%	0.00%	1.72%	100%
The team able to maintain the smooth work.	24.14%	55.17%	17.24%	1.72%	1.72%	100%
Each Team member makes the best contribution in Group Assignments.	32.76%	41.38%	18.97%	3.45%	3.45%	100%
I am satisfied with the teamwork and project results.	36.21%	48.28%	12.07%	0.00%	3.45%	100%

Respondents' perceptions related to the use of collaborative learning as part of BOLD-CLM showed that most of respondents agreed and strongly agreed with the aspects of collaborative learning activities which include discussion of target and teamwork mechanism, team strategy, team communication, team assignments, share opinions, joint decisions, maintain teamwork, team contribution, and satisfaction. This suggests that team collaboration supported by synchronous online is a potential learning model used for UT Post-Graduate programs. These results aligned with the study conducted by Tracey (2015) that the team members can carry out tasks in the form of collaborative processes through the presentation of ideas, discussion, refining them, and come to a consensus.

3.2 The Influence of the Blended Online Learning Design Based Collaborative Learning Model on Learning Outcomes

Learning outcomes in this study refer to: (1) students' ability to express opinions in discussion forums, (2) students' ability to achieve learning competencies through course assignments, and (3) the final score which is the discussion process and student competency assessment combined. The Kolmogorov-Smirnov test was carried out to test the fulfillment of the population distribution assumptions, comparing the two groups, namely the group with the BOLD-CLM (experimental group) and the group using the standard model of online tutorial (control group). Table 3 shows the results of these tests.

Table 3. Results of testing the population distribution of the experiment group and the control group

			Discussion	Assignments	Final score
One-Sample Kolmogorov-Smirnov Test					
Group			Discussion	Assignments	Final score
Experiment	N		66	66	66
	Normal Parameters[a,b]	Mean	71.0132	88.6717	65.6409
		Std. Deviation	14.04335	9.06968	7.66772
	Test Statistic		.116	.212	.100
	Asymp. Sig. (2-tailed)		.028[c]	.000[c]	.097[c]
Control	N		71	71	71
	Normal Parameters[a,b]	Mean	71.3077	80.1172	61.4517
		Std. Deviation	12.99592	10.91252	8.43098
	Test Statistic		.145	.211	.162
	Asymp. Sig. (2-tailed)		.001[c]	.000[c]	.000[c]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.

Based on Table 3, it can be concluded that only data from the final score in the experimental group fulfills normal distribution. Meanwhile, data from the other groups were not normally distributed. Thus, the comparison test of discussion scores, assignment scores, and tutorial final scores between students in the BOLD-CLM and students in the standard online learning was performed using the Mann-Whitney test which is one of the non-parametric tests for the comparison of the two.

The results of the Mann-Whitney test conducted by comparing the discussion scores, the assignments score, and the final score between students who took the tutorial with the BOLD-CLM (Experiment Group) and students who took online tutorials with standard online learning (Control Group) were as Table 4.

Tabel 4. Mann-Whitney test results on discussion score, assignments score, and final score between the experiment group and the control group

Null Hypothesis	Test	Sig.	Decision
The distribution of DISCUSSION SCORE is the same across categories of GROUP	Independent-Samples Mann-Whitney U Test	.448	Retain the null hypothesis
The distribution of ASSIGNMENTS SCORE is the same across categories of GROUP	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis
The distribution of FINAL SCORE is the same across categories of GROUP	Independent-Samples Mann-Whitney U Test	.026	Reject the null hypothesis

Asymptotic significances are displayed. The significance level is .05

The test results in Table 4 show that the discussion scores between students who took tutorials with the BOLD-CLM (Experiment Group) and students who took online tutorials with standard online learning (Control Group), were not significantly different. Thus, it can be concluded that BOLD-CLM has not been able to have a significant effect on students' ability to express opinions in discussion forums.

Meanwhile the test results show that the score of the assignments between students who took the tutorial with the BOLD-CLM (Experiment Group) and students who took online tutorials with standard online learning (Control Group) differed significantly (.000). Thus, it can be concluded that collaborative learning in the BOLD-CLM has a significant effect on students' abilities in achieving learning competencies. The test results on the final scores of the courses between students who took the tutorial with the BOLD-CLM (Experiment Group) and students who took the tutorial with standard online learning (Control Group) differed significantly (.026). It can be concluded that BOLD-CLM has a significant effect on the final grades in students' courses. The study shows that BOLD-CLM has a significant effect on the learning outcome as study conducted by Lister (2014) on 17 research results related to online learning. Lister concluded that the collaborative aspect is an important aspect in designing online learning. The design of collaborative learning models in online learning that considers the principles of

instructional design is expected to provide an optimal learning process and provide opportunities for distance education students to have higher interactions with other students and with tutors. Thus, it is important to incorporate the collaborative learning into online learning design that would be able to promote a better learning process.

4 CONCLUSIONS

The Blended Online Learning Design Based Collaborative Learning is a new learning model implemented through "research and development" activities. Several research results can be used as a reference and further development of this model. The main thing to consider is that this model can help the students' learning process. Some of this study results show that this model is relevant and useful during synchronous online meetings. The most visible synchronous online meeting frequency is four meetings per subject per semester. It is the right amount considering the need for flexibility involving distance learning students. Meanwhile, learning strategies in synchronous online meetings can vary, which include presentation by tutors/lecturers, presentation of assignments by students, or discussion activities. Therefore, BOLD-CLM also provides opportunities for students to communicate with tutors, meet classmates, discuss, and gain new insights.

In terms of online collaboration learning, there are several things that need to be considered to accommodate team collaboration in working on assignments, such as providing directions or guidelines at the beginning of the learning activities. There are several important things that should be included in the guidelines: strategies for doing assignments, communication between members, freedom to express opinions; enjoy working in group, maintain smooth working; provide opinions to achieve quality work results; joint decisions; make the best contribution; and use communication media to facilitate group communication.

The study results related to the effect of the BOLD-CLM on the learning outcomes need to be considered in further utilizing this model. The significant difference in assignment scores and final grade scores between the students who use this model and the students who do not use this model shows that the BOLD-CLM has a relevant impact on the learning process and the achievement of learning outcomes. This has a positive value in improving the quality of online learning which has become a trend in the learning environment as well as become a tool in training students to do an assignment which involves a higher order thinking.

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