

## Implementation of Online Problem-Based Learning And Nursing Students' Engagement With Modified Online Discussion With Seven Jumps (MOODS7)

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### Abstract

The problem-Based Learning method is a problem-oriented case-based learning approach recommended for nursing education. This study describes the trial application of the Problem-Based Learning learning method in the online system. The seven jumps discussion, usually done face-to-face and conventionally, in this study, was changed to an online forum by going through the same seven stages. The purpose of this study is to describe and assess the effectiveness of the online discussion process using Modified Online Discussion With Seven Jumps (MOODS7) application. The quasi-experimental method was carried out on 47 students of the DIII Nursing study program. They were given seven jumps online discussion discussing the case scenario of diabetes mellitus in the medical-surgical nursing field. The mood7 application is a medium for inputting cases, dividing small groups, and discussing via chat. Data analysis using T-Test counted every good discussion at each stage of the seven jumps. Student's involvement was identified through the Online Student Engagement Scale. The MOODS7 obtained 273 valid chats conducted by five small groups during the discussion. The intervention group showed an increased ability to think critically in solving vignette problems with a significant mean pre-post p-value ( $0.001 > 0.005$ ). Online discussions with the Mood7 application are sufficient to help students understand learning content better, be more active, and participate in making learning more enjoyable. The implementation of seven jumps with MOODS7 can be applied to nursing students. An online discussion is an option for increasing engagement and in accordance with the characteristics of learners in era of information and technology.

**Keywords: Problem-Based Learning; Seven Jumps; Online discussion; Nursing Student**

### INTRODUCTION

The problem-Based Learning method is a problem-oriented case-based learning approach recommended for nursing education because it is relevant to how nurses practice (Hormazábal-salgado et al., 2021). Currently, PBL is considered capable of making students have Problem-solving skills, be active in group discussions, and improve communication and critical thinking (Bruce et al., 2018). However, conventionally, PBL is carried out face-to-face or in direct meetings. Interactivity and active participation in face-to-face discussions have been the main characteristics of this learning method (Sohaya, 2018). Along with the development of the digitalization of the education system, online learning has become a necessity today. In addition to the ease of access and flexibility of time, even online discussions are believed to increase motivation and student satisfaction (Kumar et al., 2021). Several studies have implemented a learning model with online meetings. A study in China stated that during the covid pandemic, online discussions were also able to increase knowledge. Besides, the main

advantage is effectiveness in time and space (Kim & Kim, 2021). The current challenge is to combine PBL with the seven jumps method so that it can be done online.

One way that can be used is by using a website. The form is currently popular and easily accessible through an application. Small group discussion is one of the learning methods that can facilitate everyone to come up with many ideas according to the topic being discussed. In face-to-face meetings, the opportunity to explore ideas with other people (group members) is very open because clarification and exchange of ideas occur directly. Small group allows communication, interaction, motivation, and clarity (Ernest W Brewer, 1997). In particular education fields such as medicine and paramedics, group discussions can make students understand field cases, improve thinking critically and increase interaction to discuss patient or clinical problems (Arja et al., 2020). The application of small group discussion to the PBL method is seven jumps. Seven jumps are stages designed so tutorials run according to plan, are structured, and can facilitate the discussion or run effectively (Dixson, 2015). The seven tutorial steps that are executed when performing the PBL tutorial are as follows (Sohaya, 2018):

- a. Step 1: Clarification of terms and concepts; students clarify terms and concepts that exist in the case scenario
- b. Step 2: Formulation of the problem statement, Determine the Problem, then make a list of phenomena or events to explain
- c. Step 3: Brainstorming, students actively find as many diverse explanations as possible for the phenomenon or event.
- d. Step 4: Categorization and structuring of statements, Students discuss with each other about the discussion. Furthermore, criticize each other's explanations given by other tutorial participants and provide a coherent description of the process that the student thinks is the basis of the phenomenon or event.
- e. Step 5: Formulating learning outcomes, Formulating learning objectives in the context of independent learning
- f. Step 6: self-study, filling in the gaps that exist in the knowledge that students have from the results of their independent learning
- g. Step 7: Presentation, share discoveries in the discussion group and try to integrate the knowledge gained in the discussion through a comprehensive explanation of the phenomenon or event

We created a web-based application that allows seven jumps of PBL discussions to be carried out online. Through this application, you want to explore the level of student involvement in the discussion process by implementing seven jumps in face-to-face discussions. The advantages of the online discussion model are cost, space, and time effectiveness. In this MOODS application, we modified the use of facilitators, the service of classes, and more flexible study times.

Learning interactions between fellow students in small groups based on chat via the provided chat room. The process of responding to each other and reciprocating responses is evidence of the discussion

process. Meanwhile, we propose the interaction of facilitators with students, with one facilitator who can control all groups during the discussion process

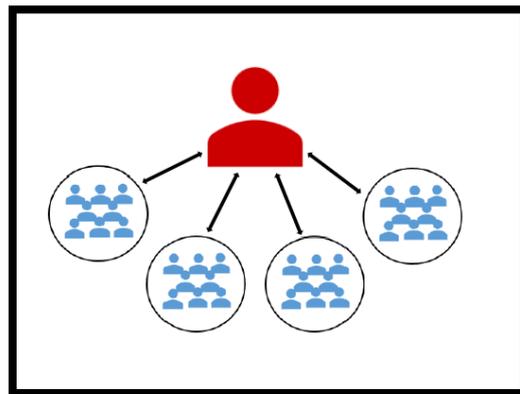


Figure 1. Didactic interaction model on Moods7 online discussions

Mood7 is a website-based learning application that can help students discuss in small groups online. Through this application, students can have discussions guided by tutors online by fulfilling the steps of seven jumps. The mood application website that can be accessed is <http://103.181.183.40/>.

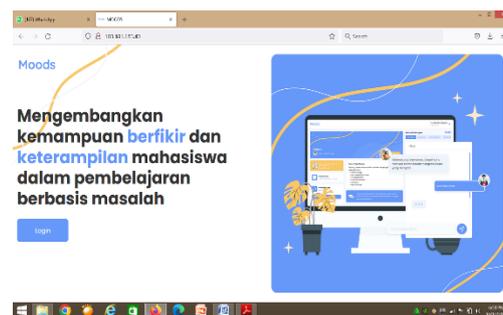


Figure 2. Frontpage and login of the MOOD7 App

Here is the initial page to start entering the student online discussion application. Students only log in using the Student's Card Member/identity username and password.



Figure 3. Menu Page

The picture above explains that this application is a lecturer as a facilitator providing trigger cases as discussion material that students will continue through a discussion stage mechanism based on seven

jumps in PBL. Students can be divided into small groups of up to 9 and can only discuss in the small group. Meanwhile, facilitators or lecturers can see the students of the diploma Nursing study program discussion process.

## METHODS

The study we designed was to observe the process of the students of the diploma Nursing study program online discussion by applying seven jumps PBL. The quasi-experimental stage design for students is to assess the effectiveness of an online discussion strategy using Moods7. Previously, the facilitator was trained to run the Moods7 application and lead the online discussion, namely, making classes, forming small groups of students, and leading chats according to the MOODS7 stages.

We explained to prospective respondents the primary purpose of this trial. Respondents are 46 second-grade students in the Singkawang Diploma program who participated and were a lecturer as a facilitator. Students are tasked with discussing a case with a scenario made with Medical Surgical Topics Nursing Care Plan for Diabetes Mellitus Patients.

After logging in with a personal student card number and entering the Moods7 application, students will immediately be divided into small groups (8-9 students). The discussion occurred after the students read the case in their small groups and started an argument based on the seven jumps stages. Unlike conventional face-to-face seven jumps, we put a time limit on the Moods7 application.

Table 1 Time Limits of Each Step

Step	Step name	Time limit
1	Clarification of terms and concepts	20 mnt
2	Formulation of the problem statement,	20 mnt
3	Brainstorming	30 mnt
4	Categorization and structuring of statements	20 mnt
5	Formulating learning outcomes	10 mnt
6	Self-study	Self-study
7	Presentation	2 <sup>nd</sup> meeting

The instruments used in data collection in this study consisted of the following Online Student Engagement Scale (OSES) with a Likert scale that indicates how well these online discussions and mood apps represent their characteristics (Dixon, 2015). The data analysis is to perform a descriptive statistical analysis of all five groups involved and count the total number of valid messages or chats.

## RESULT

The respondents in this study were 5th-semester students in the Department of Nursing, polytechnic Ministry of Health Pontianak. Votes of respondents based on that in semester three students are students who have been learning online mainly in the same direction, not allowed to discuss. At the same time, the subject of the course or learning material given is Surgical Medical Nursing with a sub-material on cases of diabetes mellitus. This study's total number of respondents was 47 students divided into five small groups. The characteristics of respondents in this study can be seen in the following table:

Table 2 Characteristics of research respondents

Variable	Intervention group	
	n	%
Gender		
Man	10	21,3
Woman	37	78,7
Age		
≤ 18 years	15	28,8
> 18 years	32	71,1
Department		
IPA	29	61,7
IPS	14	29,7
Nursing	4	8,5

### Frequency of valid messages or chats from the app

The results of calculating the number of chats that are included in the online discussion process with the MOODS7 application.

Table 3. Frequency of valid messages or chats from the app

Group	Discussion online Moods				
	Group 1	Group 2	Group 3	Group 4	Group 5
Total chat	40	45	53	70	65

The result of the Average increase (mean) of learning outcomes from the pretest to the post-test

Table 4. Average increase (mean) of pre and post-test in both groups

Variable	Knowledge of Critical Thinking		difference	P
	Pre-test	Posttest		
	Mean ± SD	Mean ± SD		
Intervention group	4,98±1.511	7.38±3.573	2,4	0,001*
Control group	5,00±1.643	6.22±1,725	1,22	0,002*

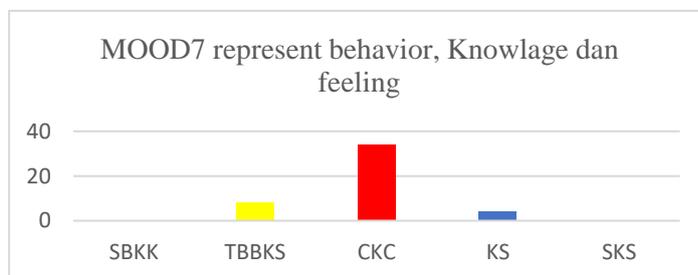
The result of independent t-test results from the two groups' pre-test and post-test

Table 5 Differences in mean differences between intervention and control groups

Learning outcomes	Group		p
	Intervention Mean ± SD	Control Mean ± SD	
<i>PreTest</i>	4,98±1.511	5,00±1.643	0,001*
<i>Post Test</i>	7.38±3.573	6.22±1,725	0,001*
<i>Mean pre dan post-test</i>			0,000

The Author measured student involvement in online PBL discussions with seven jump stages with a self-report questionnaire adopted from the Online Student Engagement Scale. The results of the questionnaire are as follows:

a. MOOD7 app makes more understanding of the material

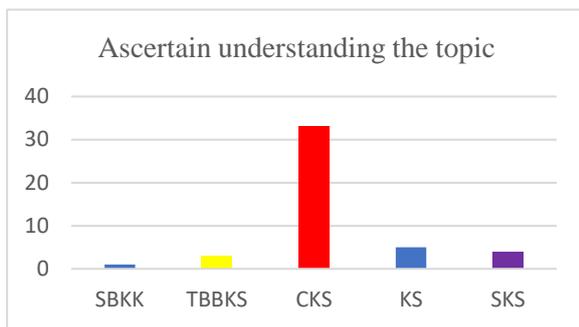


Explanation:

- SSBKS= Not at all my characteristic
- TBBKS= Not really my characteristics
- CKS= Quite Representative of MyCharacteristics
- KS= My Characteristics
- CREDITS= Very My Characteristics

Based on the diagram above, the results of student self-reports of the MOOD7 application in online discussions mainly stated that it represented their behavior, thoughts, and feelings. However, some students still said that MOOD7, an online learning application, does not express their behavior, ideas, and emotions.

b. MOOD7 app helps to understand the topic



Explanation:

SSBKS= Not at all my characteristic

TBBKS= Not really my characteristics

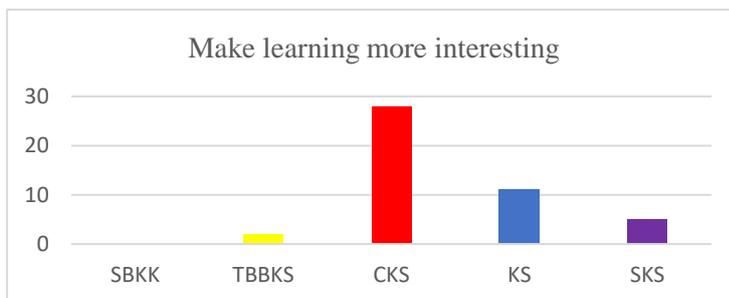
CKS= Quite Representative of MyCharacteristics

KS= My Characteristics

CREDITS= Very My Characteristics

Based on the diagram above, the results of student self-reports using the MOOD7 application in online discussions, most students stated that it was pretty helpful for them to understand the material. Even some students say that MOOD7 as an online learning application is beneficial for them to understand the material.

c. MOOD7 app makes learning more interesting



Explanation:

SSBKS= Not at all my characteristic

TBBKS= Not really my characteristics

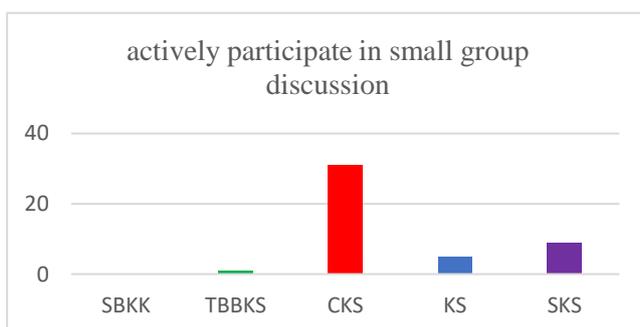
CKS= Quite Representative of MyCharacteristics

KS= My Characteristics

CREDITS= Very My Characteristics

Based on the diagram above, the results of student self-reports using the MOOD7 application in online student discussions mainly stated that it makes learning more enjoyable.

d. MOOD7 helps students play an active role



Explanation:

SSBKS= Not at all my characteristic

TBBKS= Not really my characteristics

CKS= Quite Representative of MyCharacteristics

KS= My Characteristics

CREDITS= Very My Characteristics

Based on the diagram above, the results of student self-reports on using the MOOD7 application in online discussions, most students stated that it was enough to help them play an active role and participate in discussion forums in small groups.

## DISCUSSION

The main result of this study is the implementation of PBL seven jumps through online discussion. The resulting chat frequency indicates student group participation is still in a reasonably high category. It can be interpreted that even without face-to-face, the implementation of seven jumps based on each stage can be carried out.

Following our goals, the Moods Application was created to facilitate the online discussion process in a more focused manner. The seven jumps step is used as a stage in the discussion process in this application to make students interested and direct the discussion to go according to the plan.

Unlike the face-to-face seven jumps, we still had problems with some students who could not come up with ideas. However, through online discussions via chat, it helps students respond to be able to explore their ideas more.

The study of several attributes affecting student satisfaction in online learning includes clarity, usability, stimulation, media attractiveness, and innovation (Agyeiwaah et al., 2020). In this moods application, we prioritize the attributes above, including simple features that can be used with mobile devices and clarity in trigger cases and discussion steps.

The suitability of the topic or scenario is also one of the primary keys in carrying out PBL discussions with the seven jumps model. Case scenarios must be able to bring students to achieve learning outcomes. In this study, we take an exciting and quite complex method. This scenario makes online discussions more interactive. Reports of students participating in the program stated that the more attractive the design, the more interesting the chat or chat. In line with a study conducted by Kent, the interactivity that occurs in online discussions is directly correlated with student learning outcomes (Kent et al., 2016).

Student knowledge test results are measured by comparing or measuring the average or mean increase from pre-test to post-test. In this study, students' critical thinking ability was carried out by providing competency test questions about DM disease, which requires critical thinking. Furthermore, both research groups conducted statistical data testing with paired t-tests. The results of this test are to determine statistically whether the use of online discussions with the application of MOOD7 or conventional methods is meaningful or not in improving test scores before and after being given the method. The decision-making guidelines for paired t-tests are when the probability value or sig. (2-tailed)  $\leq 0.005$ , then the method is statistically meaningful.

This research shows that in the intervention group, the average value (mean) of learning outcomes from the pretest to the post-test was higher than in the control group. Based on these results, the hypothesis in the study was stated to be accepted, namely that there was an increase in the results of the written exam with vignette questions about the cases discussed in online discussions.

The results of the statistical test further aim to compare mean differences in the average test results of two different or unpaired groups of subjects. In this study, the Independent T-Test was used to determine whether one method was more meaningful or influential in improving the results, namely the difference between the mean pre to post. The results of this test were declared significant if the p-value of the difference between the two groups was tested  $\leq 0.005$ . The statistical test carried out in this different test is an independent t-test and the results show significant differences in the two groups' pre-test and post-test results of the written test, with the intervention group with a higher pre-test score. These results showed that the intervention group had better learning outcomes than the control group in terms of score scores.

However, the mean difference between the intervention and control groups obtained a p-value ( $0.000 \leq 0.005$ ), concluding a meaningful result. The results of the independent t-test showed that in the difference between the mean pre the post-test, the results of the written test of the intervention group were better than those of the control group.

The student engagement questionnaire results showed that most students admitted that online discussions through MOODS7 increased engagement and represented their characteristics as applications that make learning more enjoyable, make participation easier, facilitate understanding of the material and describe student behavior.

This result is supported by a study that states that online discussion can bring students to spend time online, thereby increasing their involvement. Online conversations that are made over a reasonably long time can improve the knowledge construction process and have enough time to give each other feedback and increase motivation (Waheed, 2017).

The general constraint for the implementation of this study is the readiness of the application and network. Some respondents have difficulty accessing and cannot start discussions and chat.

## **CONCLUSION**

Based on the research results above, the conclusions that can be drawn from this study are: using the Mood7 application can facilitate the implementation of PBL online, obtained as many as 273 valid chats conducted by five small groups during the discussion. The online discussion model created through the MOOD7 application can also immensely increase student engagement with learning. This application model can make learning more exciting, make students participate more in education, and increase their understanding of learning materials.

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