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Modification of Problem Based Learning and Team Based Learning Method In Group and Community Intervention Course

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Abstract

Group and community intervention is applied course of social psychology. Several studies show the use of modified problem-based learning and team-based learning methods is effective to achieve the objectives of applied courses. This study aimed to see the effectivity of applying modified problem-based learning and team-based learning methods on group and community intervention course material in increasing students' understanding. One-group pre test – post test experimental research design was used to conduct this study. The subjects were students who take group and community intervention courses. Data is taken from quiz score given before and after the intervention. The results of the analysis using one-way ANOVA repeated measure with sphericity assumed shows the average student understanding statistically increased between the time of measurement F (2,32) = 127,067, p .000<.005. Thus, it is proven that students' understanding of student subject matter significantly increased.

Keywords: *Modification Learning, Problem-Based Learning, Team-Based Learning, Intervention,*

Introduction

Universitas Negeri Malang (UM) has developed a new curriculum since 2018, namely the Life-Based Learning Curriculum (LBLC). This curriculum emphasizes that the learning process must be oriented towards meeting the needs of students in developing their personal capabilities in order to face the complexities of life and the challenges of their lives in the future. (LP3, 2020). One of the subjects included in this new curriculum is group and community intervention. This course is one of the applied courses of the Social Psychology. Implementation of the new curriculum at UM causes the need to adapt learning methods. Adewuni et.al. (2017) mentions that various kinds of learning methods can be applied to meet the needs of students in achieving the curriculum objectives as outlined in each learning achievement. So far, the lecture method in social psychology cluster course is using conventional methods. For example, lecturers give lectures, then students are assigned to make presentations or do case analysis. The learning goals of the group and community intervention course is that students are able to assess community needs and resources as well as to design community intervention models and to carry out community interventions. These goals are impossible if not hard to achieve when conventional learning methods that have minimal interaction with the actual case is used. Learning methods that are considered capable of improving course goals achievement are team-based learning and problem-based learning methods.

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Problem Based Learning (PBL) is a teaching method in which students are encouraged to understand concepts and principles through real problems as opposed to direct presentation of facts and concepts. PBL encourages the development of critical thinking skills and problem solving skills, increases the ability to develop communication skills, and opportunities to collaborate in groups (Thorndahl & Stentoft, 2020). PBL was originally applied to the medical field but in its development problem based learning was developed and used for learning in the field of behavioral science (Servant-Miklos et al., 2019). In its development, PBL is used in community-oriented sciences. The advantages of implementing PBL in the psychology curriculum include improving problem solving and critical analysis skills (Karantzas et al., 2013), and improve psychological literacy (Fonteijn & Dolmans, 2019) In addition, it can improve the ability to learn independently, deal with uncertain conditions, increase self-confidence, work together, and integrate psychological theory and practice. (Dunsmuir et al., 2017).

Team Based Learning (TBL) is a specific instructional strategy designed to (a) support the development of high performance oriented learning groups and (b) provide opportunities for the team to contribute significantly to the learning process (Fink, 2004). The impact of implementing TBL includes increasing critical thinking (Espey, 2018); make students' perceptions of learning more positive (more actively involved in discussions, enjoy interactions with classmates, etc.) and increase students' intrinsic motivation in learning (Silberman et al., 2021), all of which have an impact on increasing student grades (Tan et al., 2022). TBL is appropriate for materials related to health (psychiatry, pharmacology, and psychology)(Brame, 2013). TBL consists of three distinct phases: (1) preparatory tasks before a face-to-face session, such as reading or watching video material, (2) individual and group readiness test (iRAT and gRAT) consisting of multiple choice questions aligned with the content in the preparation material, and (3) group application activities that require students to apply material from preparatory assignments to “real world” scenarios(Reimschisel et al., 2017).

In general TBL is effective in improving psychological learning in the form of increasing students' understanding of lecture material (Flores-Sandoval et al., 2021), as well as effective communication skills and responsibility for group assignments (A. Burgess, Roberts, et al., 2021). However, the application of PBL alone has not yet been able to maximize the learning process. Several aspects complained by students in the application of PBL, such as the lack of student involvement in interacting with fellow students (Burgess et al., 2020). One alternative to answer the problem of the shortcomings PBL method is to mix and apply PBL with TBL (Burgess et al., 2014). Psychology teachers are advised to consider the application of TBL in their teaching and learning process, especially for applied materials and classes that aim to develop skills (Madson et al., 2020).

Burgess et.al. (A. Burgess et al., 2018; A. Burgess, Matar, et al., 2021) compared the PBL and TBL methods. In PBL method, students reported the variable of tutor expertise; limited learning directions; and the large number of groups hinders their learning, which can be prevented in the application of TBL on the same course. Aspects they liked about the TBL method were the smaller group size, the availability of a readiness test before each lecture, direct feedback from tutors, and time efficiency. In line with Burgess, Belwal et al., (2020) found that PBL accompanied by group learning could increase student engagement in learning compared to no group.

Although the development of lectures using active learning methods has been carried out a lot, developing using modifications between problem-based learning and team-based learning has not been done much. In addition, the application of team-based learning is often found in research on medical education, in this study, the development of lectures was carried out for undergraduate psychology education. This study was conducted because the application of modified TBL and PBL learning methods in psychology courses is still very rare. The application of the TBL method is often found in medical lectures. The aim of this study was to see the effectiveness of the application of modified TBL and PBL learning methods to improve student understanding in group and community intervention courses. The research question in this study was whether there were any changes before, during and after the application of the modified TBL and PBL learning methods. Thus, the research hypothesis was formulated as there were differences between before, during and after the application of the TBL and PBL learning methods.

Method

Desain: This study used a quantitative research approach with a quasi-experimental method. The experimental design used is a one group pre-test post-test design. Subject: The subjects in this study were psychology students from the 2018 class E who got group and community intervention course in semester six of 2020/2021. Subjects were 17 people, who took 3 quizzes given as a measurement of understanding of the complete group and community intervention course material. Instrument: measurement of student understanding is taken using a quiz consisting of 10 questions. The questions are arranged based on the lecture material.

Procedure: Group and community intervention course is a compulsory subject for 6th semester psychology students with a weight of 2 credits/2js. Before the lecture began, the lecturer prepared a syllabus and teaching materials for each meeting. At the first meeting, the lecturer made a lecture contract with the students. In the first material, the learning method used conventional methods and at the end of the course, students were given the first quiz as a pre-test. Starting from the second material to the seventh material, the learning method used modified TBL and PBL. At the end of the fourth material, students were given a second quiz as the middle measurement, and at the end of the seventh material, students were given a third quiz as a post test.

Results

After confirming that the data were normal (Shapiro-wilk, p 0.283>0.05), the hypothesis is tested. The hypothesis was built based on research questions which compare students' understanding of the material after being given learning method of modified TBL and PBL. Hypothesis was tested by comparing the pretest, during, and post-test using repeated measure ANOVA.

Table 1. Mauchly's Test of Sphericity

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b]		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Time	.773	3.798	5	.580	.858	1.000	.333

Table 2. Tests of Within-Subjects Effects

Source		Type III Sum of Squares	df	Mean Square	F	Sig	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Time	Sphericity Assumed	29368.627	2	14684.314	127.067	.000	.888	254.134	1.000
Error (Time)	Sphericity Assumed	3698.039	32	115.564					

a. Computed using alpha = ,05

Based on table 1, the data has met the sphericity test (p = 0.580> 0.05) so that it meets the similarity of variance or homogeneity in the sphericity test. The hypothesis test was concluded from the results of the analysis using one way ANOVA repeated measure with sphericity assumed shows the average student understanding statistically increased between the time of measurement. Significant F(2,32) = 127,067, p .000<.005 (see table 2).

Table 3. Pairwise Comparisson

(I) Time	(J) Time	Mean Difference (I-J)	Std. Error	Sig.[b]
1	2	-51.765*	3.235	.000
	3	-50.000*	3.738	.000
2	1	51.765*	3.235	.000
	3	1.765	4.043	1.000
3	1	50.000*	3.738	.000
	2	-1.765	4.043	1.000

Based on the pairwise comparison (see table 3), it can be seen that there is a significant difference between pre and measurement between the intervention, and the difference between the pre and post intervention (p = .000). However, there was no significant difference between intervention and post intervention (p = 1,000). this is not strange considering that the mean of the measurement between intervention and post intervention has decreased (M 73.53 to 71.76) (see table 4).

Table 4. Descriptive

	Mean	Std. Deviation	N
Pre1	21.76	10.146	17
During	73.53	12.719	17
Post2	71.76	10.744	17

Discussion

The results of the data analysis support the hypothesis that the application of modified TBL and PBL learning methods improves students' understanding of the group and community intervention course material. TBL provides the advantage which was the enhanced interactivity of PBL and the controlled content delivery of lecture(Dearnley et al., 2018; Xue et al., 2021). According to the results of the pairwise comparison, there was an increase in students' understanding of the material in the pretest and measurement during the intervention. According to Tsai & Jao (2020), team based learning can improve students' understanding of the course material. This is possible because in the application of TBL students are required to read the teaching materials that have been provided before starting the lecture. In TBL students are required to be active and collaborative during lectures (Burgess et al., 2021) that allowed students to increase their understanding of the material. Phases in TBL are (1) preparation tasks before face-to-face sessions, such as reading or watching video material, and (2) individual and group readiness tests (iRAT dan gRAT) (Reimschisel et al., 2017).

These two phases can increase individual intrinsic motivation in pre-lecture preparations and collaboration with group members in problem solving activities. This is also supported by the characteristics of the application of PBL that learning can be effective if students collaborate in small groups and flexible tutor guidance (Moallem et al., 2019). Kelly found in his research that group learning and PBL effected the engagement between group members (Dita et al., 2021). In the application of PBL, the impact on individuals is also found, such as using reason and logic in evaluating and testing assumptions that have been built, and applying their knowledge and skills in a way to solve problems. (Karantzas et al., 2013). Although there was a significant increase from the pre-test score measurements during intervention, there was a decrease in the average scores of students' understanding of the material in the middle and post-test. This may be because the application of this learning model is still very new in psychology, especially in our department so that its effectiveness is still not consistent. In addition, improvements are needed in terms of better alignment of the pre-reading task with the case used for problem analysis, and greater facilitator interaction during problem solving activities. According to Kelly, preparations are needed by lecturers in each lecture, namely the provision of open ended questions, opportunities for students to reflect on the material they are learning and directing students in learning (Alrajeh, 2020).

The limitation of this study was, the subjects in this study only came from one class and were not randomly chosen, which was the class taught by the writer. This was taken for practical reasons. In addition, the subject matter is limited because lectures are conducted online so that the collection of pretest, during and posttest data cannot be controlled. Often students forget to fill out the quiz even though they have been reminded in the lecture forum. The second limitation is that the researcher only used the pretest, during and post-test scores to compare the results of the intervention. Whereas in TBL there are iRAT and gRAT scores that can be used to compare the application of modified TBL and PBL learning methods. So, for further research it is recommended to use a true experimental design so that the application of TBL and PBL modified learning methods can be observed more effective. In addition, for further research, researchers can conduct a more complete data analysis by comparing the iRAT and gRat scores so that the analysis is more comprehensive.

Conclusion

PBL and TBL modifications are able to increase students' understanding in general. The combined application of PBL and TBL principles in courses makes students prepare before entering class and collaborative discussions with peers make it easier for them to gain a deeper understanding of the material. The results of the analysis using one-way ANOVA repeated measure with sphericity assumed shows the average student understanding statistically increased. Thus, it is proven that students' understanding of student subject matter significantly increased. The limitations of this study were that the subjects only came from one class and the subject matter was limited so that pre-test and post-test data collection could not be controlled. The second limitation is that the researcher only used the pretest, during and post-test scores to compare the results of the interventions. Whereas in TBL there are iRAT and gRAT scores which can be used to compare the application of modified TBL and PBL learning methods. So, for further research it is recommended to use a true experimental design so that the application of the modified TBL and PBL learning methods can be observed more effectively. In addition, for further research researchers can compare iRAT and grat scores so that the analysis is more comprehensive.

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