



E-Team Study and E-Teaching Group Learning Strategies to Enhance Pharmacy Student's Reading Comprehension

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Abstract. The low score on the theory test has been extensively reported in Indonesian, perplexing the lecturer team. Consequently, research on learning strategies to improve students' theoretical test scores have been widely carried out. This study examines the effect of the E-Team Study (ETS) and E-Teaching Group (ETG) on students' reading comprehension. A pre-test, post-test, experimental group, and quasi-experimental design were used. A sample of 74 students was taken from a population of 234 students of the Surabaya Pharmacy Academy (AFS), Indonesia. Reading Comprehension Achievement Test (CRAT) (KR-21 = 80), E-Team Study Questionnaire (ETSQ), and E-Teaching Group Questionnaire (ETGQ) were used for data collection. Data were analyzed using mean and standard deviation, analysis of covariance (ANCOVA), and t-test. The findings revealed that students exposed to ETS and ETG learning achieved significantly higher average achievement scores in the CRAT than their previous test scores ($F(1.72) = 5.516, p < 0.05$). Students showed a significant and positive attitude towards the use of ETS and ETG ($t = 5.8, p < 0.05$). So, ETS and ETG are effective strategies for successful reading comprehension learning. It is recommended that Indonesian language lecturers use ETS and ETG to improve student achievement in reading subjects, especially pharmaceutical reading mastery which is a difficult concept to understand.

Keywords: Achivement · E-Team Study · E-Teaching Group · Learning Strategies · Reading Comprehension

1 Introduction

The mastery of reading comprehension is essential for the student, along with mastery of pharmaceutical theory for pharmacy students. Excellent reading comprehension helps students understand a text [1, 2]. In addition, strong reading skills requires a supportive environment [3, 4], and mastery of reading comprehension on pharmaceutical themes is crucial.

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Students learn critical linguistic topics in Indonesian language courses. That course provides the foundation that supports reading comprehension mastery. Reading comprehension is crucial in mastering pharmaceutical theory. According to [5, 6], the ability of students to understand reading texts is inherently related to their ability to accurately and efficiently understand sentences and conclude meaning. Thus, understanding the concept of sentences and the ability to infer meaning is very important for understanding the readings in class. Despite the importance of the inherent factor, several studies have found that mastery of reading comprehension is challenging for students [7–10]. In addition, several studies also reveal that students have many shortcomings regarding reading comprehension [11–14].

The ineffective learning strategies used by AFS lecturers lead students to perceive reading as difficult and have misconceptions, resulting in a low understanding of pharmaceutical theory. [15] stated that poor student achievement and misconceptions in science courses can be induced by the learning approach adopted by lecturers. Effective learning methods that actively involve students and groups works play an important role in mastering reading comprehension. Those methods are based on the constructivist theory adopted by [16, 17], which emphasizes the importance of students' active participation in learning. Besides, the methods also involve social learning theory from [18], which proposes intervention in small groups during reading comprehension. Therefore, an alternative approach with higher intensive interventions in the learning environment is required, along with a new teaching strategy emphasizing active learning and an adaptive learning environment.

Some constructivist-based teaching strategies that can enhance reading comprehension include the involvement of teams [19, 20] and reading comprehension with review outputs [21, 22]. ETS is an instructional strategy that requires collaboration between students in groups to understand the meaning of reading and master the concept of the online reading material. ETG, on the other hand, is an integration of previous learning strategies where students work in groups to reassemble their attained information from reading material, and then the students present it in front of the class and lead the class. Therefore, constructivist learning theory can be used to explain ETS and ETG.

2 Method

Research Design

This study used a mixed approach. Data from qualitative and quantitative sources were collected and examined. Mixed methods research, according to [23], refers to a situation where researchers collect, analyze, and integrate qualitative and quantitative data in one study. Quantitative data consisted of pre-test and post-test student learning outcomes, while qualitative data consisted of students' responses to open questionnaires. A pre-test-post-test group design [23] was used in this study. This design was appropriate for this study because students were taught in their classes. Thus, using whole classes allowed us to experiment with multiple classes. Table 1 shows the layout of the research design.

Table 1. Research Design Layout

Groups	Pre-test	Treatment	Post-test
EG 1	O1	X1	O2
EG 2	O1	X2	O2

Table 2. Participants Distribution

Group	Male	Female	Total
E-Team Study (ETS) (EG1)	7	31	38
E-Teaching Group (ETG) (EG2)	7	29	36

Means:

EG1: Experimental Group 1

EG2: Experimental Group 2

X1: Treatment for Experimental Group 1 using E-Team Study

X2: Treatment for Experimental Group 1 using E-Teaching Group

O1: Pre-test

O2: Post-test

Research Participants

The research was conducted in Surabaya, East Java Province, Indonesia. Purposive sampling was used in selecting two classes from six classes in vocational colleges. Class sampling was carried out based on the purpose of the Indonesian language lecturer team in semester 2 of the 2021/2022 academic year. In the end, 74 students were involved as participants, consisting of 38 students from the A2–21 class and 36 students from the A3–21 class. The 38 students in the A2–21 class were coded as EG1. Then, 36 students from the A3–21 class were coded as EG2. Table 2 shows the sample distribution for this study.

Research Instruments and Validation

Reading Comprehension Achievement Test (CRAT) was used as pre-test and post-test instruments, while E-Team Study Questionnaire (ETSQ) and E-Teaching Group Questionnaire (ETGQ) were used for the qualitative data collection. The pre-test was used to determine the student's knowledge base and academic homogeneity of the two groups before the intervention. Meanwhile, a post-test was used to determine the level of student achievement after the intervention. Both pre-test and post-test consisted of 20 multiple choice items. These items were compiled from the healthy discourse videos from Prof. Dr. Mangestuti Agil, MS., Apt. and developed based on the learning objectives of the reading course as specified in the Reformulation of the D III Pharmacy Curriculum with the field of Pharmaceutical Complement for the period 2022/2023. CRAT items were checked using a specification table, ensuring the validity of the CRAT contents [24]. We

developed the CRAT. Then, it was validated by two university doctors in the field of Indonesian language learning with more than ten years of experience. After that, a trial was conducted, resulting in a 0.80 reliability score.

After the post-test, the experimental group was asked to complete the ETSQ and ETGQ. Each questionnaire had ten items using a Likert scale with 1–5 scale, representing ‘strongly disagree,’ ‘disagree,’ ‘neutral,’ ‘agree,’ and ‘strongly agree.’ Further, the questionnaire also consisted of open-ended questions to help us learn more about students’ opinions after the intervention. The whole purpose of the questionnaire was to assess students’ attitudes toward using ETS and ETG.

Data Collection Procedure

Early Stage

During this stage, we obtained permission from the authorities, ensuring that students could participate in the research. Further, two Indonesian lecturers were selected as partners and trained on using ETS and ETG before conducting experiments in the classroom. In particular, lecturers were trained on the use of ETS, starting from the concepts, procedures, and teaching strategies. The focus of ETS is grouping students to enable learning that integrates video into discourse as a learning material. Meanwhile, in ETG training, the lecturers focused on composing discourse in group discussions and presentations prepared after watching the video. A series of questions were also used to determine the attainment of the learning objectives before the learning ended. The lecturer evaluated the group’s answers presented by the members of group. Lecturer briefing is carried out in one meeting. The lecturer team was given a lesson plan for each meeting. The lesson plans for the ETS and ETG strategies were used by lecturers in the experimental classes.

Pre-treatment Stage

CRAT was used as a pre-test instrument in the second meeting. CRAT consisted of 20 multiple-choice questions, and students were given 45 min to complete them. In completing the test, students were given instructions before answering them. Students answered the test via the Google Form application. The briefing and the test were carried out through the Zoom Cloud Meeting application. Before treatment, students in the ETS and ETG groups were given instructions at the first meeting about the concepts and procedures of the ETS and ETG strategies. In particular, the instruction emphasized the procedures to integrate video into discourse and compose the information obtained for discussion and presentation. ETS students were given the opportunity to attain information from the videos. ETG students were also given the opportunity to discuss information and present it in front of the class as an exercise.

Treatment Stage

From the third to the sixth meeting, the treatment for the experimental group in two classes was carried out online. The selected health channel video topics were presented in both classes. In the ETS group, the learning process consisted of an introduction, ETS

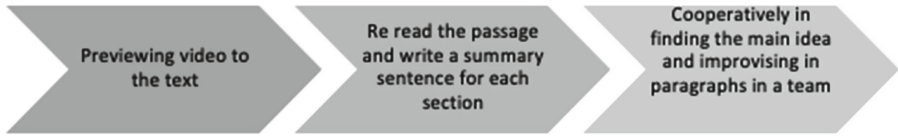


Fig. 1. E-Team Study Learning

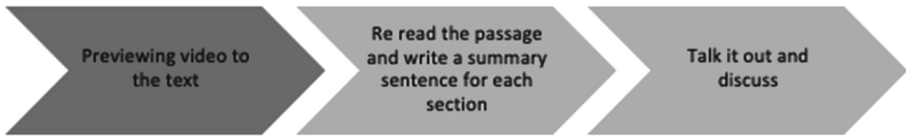


Fig. 2. E-Teaching Group Learning

learning and ended with a reflection. The same procedures were also completed in ETG group with different learning strategies (Figs. 1 and 2).

ETS and ETG learning started with watching and observing the health video from the same Youtube Channel with different videos for each meeting. Then, each team reread the part of the show that was considered interesting to take a point of view for their writing tasks. After that, the ETS class discussed the materials with the team before they made conclusions into improvised paragraphs. Meanwhile, in ETG class, they continued the activity by compiling the summaries together with their group, then presented them in front of the class and had a further discussion. After this, students were given individual tests, and the team received corrective feedback. Those who achieved 80% correct responses got a pre-determined level of mastery.

Post-test Stage

The post-test was carried out in the seventh meeting simultaneously. ETSQ and ETGQ were given to the ETS and ETG groups, respectively, for assessing their attitudes toward ETS and ETG learning.

Data Analysis

This activity involved both quantitative and qualitative data. Statistical analyzes such as mean and standard deviation, analysis of covariance (ANCOVA), and t-tests were used to summarize quantitative data. Significant main effects were used to ascertain the direction of the difference between group means [23]. In the qualitative data analysis, used content analysis to classify semantic categories into sub-themes and themes. After that, the developed themes were collected and synthesized using the semantic categories they referred to [23].

3 Results and Discussion

The pre-test score was used to ensure that the two experimental groups was homogeneous. The CRAT pre-test values for the groups are presented in Table 3.

Table 3. Analysis of Variance (ANOVA) of the Pre-Test Score

Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	123.963	1	61.981	1.670	.189
Within Groups	16549.264	72	37.106		
Total	16673.227	73			

Table 4. Descriptive Statistic Score

Method	N	Pre-test		Post-test		Mean Gain
		Mean	SD	Mean	SD	
ETS	38	76.00	7.93354753	76.94	8.51628447	76.4788732
ETG	36	67.22	7.21550359	71.93	12.0192498	69,4029851

Table 5. Summary of ANCOVA Results of Effect of Treatment on Students Reading Comprehension

Source Variance	Sum of Square	Df	Mean Square	F	Sig.
Corrected model	878.014	2	439.007	4.210	0.019
Intercept	1945.025	1	1945.025	18.654	0.000
Post-test	3.000	1	3.000	00.29	0.866
Treatment	575.123	1	575.123	5.516	0.022
Total	319991.000	74			

Table 3 shows that the mean of the two groups was not statistically different ($F(1.72) = 1.670, p > 0.05$). As a result, both groups started equally, indicating that students in the two groups had the same ability before the intervention. To determine the effect of treatment, the pre-test and post-test scores were compared, and the comparison results are presented in Table 4.

Table 4 shows the mean of students treated with ETS increased by 76.4 points, and ETG increased by 69.4 points from the pre-test to the post-test. These findings indicate that the treatment successfully increases students' reading comprehension abilities.

The effect of treatment on students' reading comprehension was analyzed through ANCOVA analysis. Finally, the results showed a statistically significant difference in post-test scores between the groups ($F(1.72) = 5.516, p = 0.00 < 0.05$). Thus, ETS and ETG influenced student achievement, as confirmed by their increased scores from the pre-test (Table 5).

Based on the summary of ANCOVA results presented in Table 5, the result of processing F was 5.516, and the significance level (Sig) was 0.022. As the analysis result is higher than F 0.05, there are differences between the two groups on the initial test at

a significance level of 0.05. The effect of treatment and the difference between the two groups' initial test results can be observed in the corrected model, with the obtained F being 4.210 and the significance level (Sig) being 0.019. Thus, the results of the analysis show that $F > 0.05$, signifying that the treatment has a significant effect on the participants at a significance level of 0.05.

Questionnaire Analysis

Descriptive analysis was used to test student responses to learning. Therefore, the theme and concept of the question were chosen, and then an assessment was carried out based on the determined answers. The results of the students' answers showed that 60 students (81%) reported being interested in learning ETS and ETG. After learning, 70 students (94%) stated that they were interested in learning ETS and ETG.

Discussion

This section explains the research results, accompanied by a comprehensive discussion. Results are presented in figures, graphs, tables, and other media to help readers understand the results easily [25, 26]. The discussion is divided into several sub-sections.

The findings of this study revealed that students in the ETS and ETG groups achieved significant improvement. This finding is consistent with the findings of previous studies, which showed that treatment with certain strategies improves student achievement [3, 24, 27]. The outstanding achievements of students exposed to ETS and ETG provide opportunities for students to participate and be actively involved in the teaching and learning process. This is in line with the views of [27], who stated that activity-oriented learning strategies help students understand the learning materials better.

The significant student improvement observed in this study is in line with [5, 15, 24], which found students significant improvement in various times and topics.

Cooperative learning provides opportunities for students to share ideas, collaborate, and gain an understanding of concepts [28]. This is also supported by [29], who argues that when students converse with one another through conversation, they can function at a higher cognitive level and develop and understand concepts. In addition, corrective feedback encourages concept development and student understanding [30].

Furthermore, it was revealed that students in the ETS group achieved significantly higher scores than those in the ETG. The results of the t-test showed that students had good attitudes toward both methods, and they were more likely to use ETS than ETG. This finding is in line with [4, 19], which revealed that students have a positive attitude toward using their respective learning strategies. These results also linear with [18], who highlighted that students' motivation to learn chemical concepts increased after being exposed to learning strategies.

4 Conclusion

This study seeks to determine the effect of ETS and ETG learning strategies on student reading comprehension in a college environment, particularly in the pharmacy department. Based on the findings, the use of ETS and ETG helps students to improve reading

comprehension in pharmacy discourse. In addition, students have good attitudes towards both learning strategies, but they are more likely to use ETS more easily than ETG for the courses. Therefore, this study reveals that ETS and ETG are effective in improving students' reading comprehension. Thus, these learning approaches can break the presumption of difficult pharmaceutical discourses. Therefore, lecturers, especially the team of Indonesian language lecturers, can make use of the benefits offered by ETS and ETG. Students in the ETS group outperformed students in the ETG group by a slight margin. Thus, further empirical research on the application of ETS and ETG on various pharmaceutical topics should be carried out to create a solid basis for their application in the pharmacy department. In addition, similar research on implementation and feasibility in their classroom setting should be carried out.

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