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The integration of mind mapping strategy on students' essay writing

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ABSTRACT

This study investigates the integration of mind mapping strategy in students' essay writing at Universities Kristen Indonesia. The study method used was a quantitative method with a quasi-experimental design. The population was the third-semester and fifth-semester students, consisting of two classes. Both classes consist of forty-four students, and the two classes with forty-four students were chosen to be the sample of this study using the purposive sampling technique. The instrument of this research is a writing test. The test was administered as a pre-test and post-test to the experimental and control group. T-tests at the 0.5 level and covariance analysis are used to analyze the data. The result is that mind maps are one of the learning alternatives that teachers can use in teaching essay lessons. Students' performance in the experimental group increased compared to those in the control group by using mind maps and critical teaching material for the students. Then it is suggested that the mind mapping could be used by lecturers as an alternative to improve the students' ability to write the essay.

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Introduction

A mind mapping strategy is an excellent tool to help students write essays (essays) structured and focused. A mind map can help plan things to write and is a valuable tool when writing essays because students can check using a mind map. In this regard, using mind maps is one of the creative elements in language teaching, such as essay teaching (Lott & Read, 2015; Vijayavalsalan, 2016; Al-Zyoud, Jamal, and Baniabdelrahman, 2017; Tay & Phang, 2022). According to him, this is because teachers use mind maps to train students to draft the content of essays to show the relevance of ideas and help produce effective writing. Therefore, to improve the achievement of students' essay writing achievement in the English Language Education Study Program throughout the country, mind maps are necessary and very relevant to the current education. In addition, the use of mind maps can help improve student achievement in the English Language subjects (Aljaser, 2017; Zheng, Johnson and Zhou, 2020; Shi, Yang, Dou and Zeng, 2022; Hwang, Huang, Wang, and Zhu, 2021; Fang, He, Hwang, Zhu, Bian & Fu, 2022). Writing is a subject assessed language skills teaching. Therefore, writing achievement is essential as it contributes to the passing marks with honors of the students.

The English Language scoring report summary shows that the candidates' essay writing questions were the most answered (Hift, 2014). The essay is the most chosen question by the candidate, while the discussion type essay question is the second choice question the candidate has chosen. However, the scorers 'comments for

these two questions, i.e., opinion and discussion type essay questions, showed that the candidate could not understand the concept of the essay title well, so the ideas presented did not meet the question's requirements. In addition, some candidates are unable to provide a variety of examples. The opinions given by the candidates were also unsatisfactory and did not meet part of the answers. From the report's summary, it is clear that the level of student essay writing affects the examination results and the level of mastery of the skills. It can be evidenced through the English Language Education Study Program analysis in November from 2000 to 2010. Based on the examination results analysis, it was found that the number of students who passed with honors has shown a significant decrease. It occurred due to the student's failure to answer some questions well. Therefore, to overcome such problems, various appropriate teaching strategies are necessary. Teachers must apply approaches, methods, and techniques to help overcome this problem in essay writing. One of the strategies that can be used to overcome the problem is to use a mind map (Karim, Abu, and Khaja, 2016; Zhao, Liu, Wang, and Su, 2022).

Studies on mind maps in essay writing are very little done in Universitas Kristen Indonesia. The results of this study are expected to provide valuable contributions to teachers and make it one of the techniques for teaching essay lessons. In addition, this study can also help students find and develop written essay ideas. In addition, the findings of this study can also be used as a guide for teachers and students. This study is also expected to help future researchers conduct more in-depth and detailed research on essay writing teaching methods. In the context of learning, the theory has changed the teaching and learning pattern from teacher-centered to student-centered learning (Lau, 2020; Torrisi-Steele, 2020; Calderón, Meroño, & MacPhail, 2020). The constructivist theory sees learning as an active and socio-cultural process (Doolittle, 2014; Naude, Bergh, and Kruger, 2014). Knowledge is constructed through mutual influence between previous and recent learning (Rauniar, Rawski, Morgan, and Mishra, 2019; Chiu & Yang, 2019). It aligns with Snyder's view of the constructivist theory, which says that students can construct their learning by combining new information with existing knowledge and experience (Snyder, 2009). One of the features of constructivist learning is to encourage students to ask questions, and there is an intellectual discussion between students and teachers (Bada & Olusegun, 2015; Alt, 2014). Today, the theory of constructivism is seen as one of the theories that strongly influence the world of education, especially involving the students. One of the essential aspects that can be developed through this theoretical approach is that students actively seek knowledge. Students can improve their understanding of something through the process.

Therefore, in this study, a combination of constructivism theory and mind map was chosen for use in the teaching and learning of essay writing. In general, a combination of mind maps and the modern theory of constructivism in learning is appropriate (Cañas & Novak, 2014; Kinchin, 2014; Etokeren & Abosede, 2022; Alt & Naamati-Schneider, 2021). Learning through constructivist theory emphasizes the active involvement of students who utilize existing knowledge structures and construct new knowledge gained by intertwining the two in their memory. In addition, learning through constructivist theory encourages students to learn cooperatively and collaboratively. It will improve student achievement in writing essays. The experimental group was taught based on constructivism theory by applying teaching strategies using mind maps in essay writing.

Meanwhile, essay writing for the control group was revealed using conventional teaching strategies. These teaching strategies were used to assess both groups' essay writing achievement. A study related to the use of mind maps in teaching Science subjects to 140 students in secondary three found that the use of mind maps in the approach to teaching is more effective compared to the use of traditional teaching approaches (Chang, Chiu, and Huang, 2018; Zheng, Johnson and Zhou, 2020). The use of concept maps positively affected student achievement and showed a change in attitude, which showed a high interest in the subject of History. In addition, the descriptive analysis of their interviews with students found that using concept maps has dramatically helped students improve their ability to remember historical facts and aroused their interest in the subject.

The sample consisted of various levels of abilities. This study found that mind maps successfully improved the quality of student essay writing. In addition, the summary of his interviews with students shows that mind maps can help them plan in various ways. Including finding a more explicit focus, organizing ideas better, having clear ideas, incorporating more relevant and accurate ideas, sketching many ideas, and making paragraphs well. The use of mind maps in improving the performance of writing Chinese narrative essays on 40 Year 5 students in one of the national type schools and found that mind maps are very effective in improving the performance of writing narrative essays (Chiang, Fan, Liu, and Chen, 2016; Liu, Chen & Chang, 2010; Lin, 2019). The study he conducted showed that 90% of the students surveyed were able to produce a narrative essay that was concise and structured. In addition, he argues that mind maps are a good and effective way to teach students to write essays. Munah (2006) studied semantic mapping learning

strategies in reading comprehension in 60 secondary students. His study found that applying semantic mapping strategies in reading comprehension can improve student achievement not only for the whole text, including content, language, and techniques.

Using mind maps with question words has successfully improved the skills of processing the content of English Language description-type essays in year 5. He stated that mind maps could help students process important essay content and improve their skills in teaching descriptive-type essays. The effect of mind maps in improving the skills of identifying the main content and content description of essay writing for Year 5 students showed that mind maps improve students' essay writing skills (Davies, 2011; Siew & Mapeala, 2016; Fu, Lie, Hwang, & Zhang, 2019). In addition, this method is also effective in helping students improve their intelligence and skills to strengthen memory and comprehension. Meanwhile, a study on improving the ability to write narrative essays using the mind map method shows that students can improve the quality of the learning process of the English language by writing narrative essays and improving teacher activities (Lin, 2019; Jameel, 2022; Akihary & Apituley, 2022; Ershad & Noreen, 2020). According to him, the increase in teachers 'activities in the learning process of writing narrative essays using the mind map method can be seen through the increase in teachers' attention to students, managing classes, and learning time. In addition, through mind maps, teachers more straightforwardly develop applications, more efficiently create learning covers, and are more trained in creating a conducive learning environment.

This study aims to determine the results of the integration of strategy mind mapping with the students' ability to write essays. To see the effectiveness of mind maps in the essay writing at the English Language Education Study Program of Universitas Kristen Indonesia, the researcher used the theory of constructivism as the basis of the study. Therefore, based on the opinion and the findings above, using mind maps in English Language teaching and learning, especially essay writing, is intended to improve student achievement.

Method

A quantitative approach is a design that underlies this study. Therefore, the researcher used a quasi-experimental method based on a different control group design in this study. This method is ideally used to test the comparison of effects in various situations, while entirely experimental techniques are not feasible. The study population was the students of the English Language Education Study Program, which consisted of 109 students from the first semester to the eighth semester. The study's sample was taken using the purposive sampling technique, where two classes were chosen purposively to be the study's sample. The number of the samples was forty-four students, who were divided into two classes. One class was used for the control group (they are taught using the traditional method), and the other was used for the treatment group (they were taught using a mind mapping strategy). Since this study was quasi-experimental, only samples in the existing class were involved. The data collection technique used in this study was done by administering the test to both groups. The tests administered consisted of two types of tests, they are testing which was administered before treatment was given and after treatment was given to both groups. The study instrument used a set of writing test sheets for pre-test and a set of writing test sheets for post-test. After selecting students, the researcher divided the students into two groups. The researcher gave both groups a pre-test, i.e., for one hour, to assess their essay writing level of initial achievement. After performing the pre-test, both groups were taught essay writing, i.e., the experimental group was taught using mind maps.

In comparison, the control group was taught conventionally. After conducting several teaching sessions (six times), both groups were given a post-test (one hour). Tests are reviewed and examined, and the researcher makes a research report. The tests are reviewed and scrutinized based on the scores achieved by students from both groups in producing essay writing. Data were collected and analyzed using SPSS version 18. T-tests at the 0.5 level and covariance analysis are used to analyze the data.

Results and Discussions

There was no significant difference in the achievement of essay writing in pre-and post-test mean scores between the experimental and control groups (Hypothesis 1). This hypothesis was tested using covariance analysis, namely analysis of the covariance test to control for differences in student achievement in the pre-test. Based on Table 1, it is found that there is an effect of the independent variable that is an influential group on the dependent variable that is post-test F = 54,491, p = 0,000. These findings prove that teaching techniques using mind maps can significantly improve student achievement in the post-test by controlling the factors of student achievement in the pre-test.

Table 1 <Essay Writing in pre and Post-test Between the Control Group and Experimental Group Analysis Using Covariance Test>

Source	*Type III Sum Of Square*	*Df*	*Mean Square*	*F*	*Sig.*
Corrected Model	1520.580[a]	2	760.290	41.610	.000
Intercept	1198.692	1	1198.692	65.603	.000
Pre-test	221.045	1	221.045	12.097	.001
Group	**995.656**	**1**	**995.657**	**54.491**	**.000**
Error	730.860	40	18.271		
Total	145284.000	43			
Corrected Total	2251.441	42			

Table 2 shows the achievement of the experimental group, i.e., students who followed the instruction using mind maps (mean = 63,04, adjusted mean = 62,510), and was found to be better than the achievement of the control group. Students who were not treated using mind maps (mean = 52,04, adjusted mean = 52,607). Based on the covariance analysis test, it is clear that mind maps have successfully improved students' essay writing achievement. Therefore, there was no significant difference in the achievement of essay writing in pre and post-test mean scores between the experimental group and the control group was rejected.

Table 2 <Essay Writing of Control Group and Experimental Group in Pre and Post-test Mean, Standard Deviation, Adjusted Mean and Standard Error>

Group	**N**	**Min**	**Standard deviation**	**Mean Adjusted**	**Standard Error**
Control	22	52.04	6.044	52.607[a]	.946
Experiment	22	63.04	3.243	62.510[a]	.923

Note: a. The calculation of the pre-test covariance value is as follows 48.13

There is no significant difference in the achievement for the mastery of the content aspect of essay writing using mind maps in the pre-and post-test mean scores of the experimental group (Hypothesis 2). This study also examines whether there are differences in the mastery of aspects of the content of the essay using mind maps. The mean achievement of the sample is stated in Table 3. Table 3 shows that the mean for the pre-test is 22.22, with a standard deviation of 3,220. In comparison, the mean for the post-test is 28.13, with a standard deviation of 1,669.

Table 3 <Mean Achievement for Mastery of Content Aspects of Essay Writing in Pre And Post-test Experimental Group>

The test	**N**	**Min**	**Standard deviation**
Pre-test	22	22.22	3.220
Post-test	22	28.13	1.669

The study found that the mean of achievement in the post was higher than the mean of the pre-test. The difference between these two tests was -5,908, as shown in Table 4. The t-test showed a significant mean difference between pre-test and post-test for the experimental group with t value = -8,067, P <0,05. This significant difference proves an increase in achievement in the mastery of the content aspects of students' essay writing after being given processing using mind maps. Therefore, there was no significant difference in achievement for mastery of the content aspect of essay writing in the pre-and post-test mean scores of the experimental group were rejected. Using mind maps could improve students' skills in identifying the main content and descriptive content, but they can also produce compact and organized processing of the content of the essay.

Table 4 <Paired Sample T-test of Achievement for Mastery of Content Aspects of Essay Writing in Pre and Post-test Experimental Group>

	Couple Differences			**t**	**df**	**P**
	Min	Standard error	Standard error			
Pre -Post-test	-5.908	3.434	.731	-8.067	20	0.000

There was no significant difference in the achievement for the mastery of the language aspect of essay writing using mind maps in the experimental group's pre and post-test mean scores (Hypothesis 3). This study also examined whether there were differences in the mastery of aspects of essay language using mind maps. The mean achievement of mastery of essay writing aspects in pre and post-test of the experimental sample is shown in Table 5. The findings show that the mean mastery of language aspects in post-test is higher than the mean of pre-test achievement. The mean achievement for the pre-test was 17,85 with a standard deviation of 1,641, and the mean post-test achievement was 22,67 with a standard deviation of 0,994.

Table 5 <Mean Achievement for Mastery of Language Aspects of Essay Writing in the Pre-and Post-test Experimental Group>

The test	**N**	**Min**	**Standard deviation**
Pre-test	22	17.86	1.642
Post-test	22	22.68	0.994

While the data from the paired sample t-test that is pre and post-test for the experimental group is shown in Table 6 showed a significant mean difference between pre-test and post-test for the experimental group with t value = -15,391, P < 0,05. This significant difference proves an increase in the mastery of the language aspect of essay writing students after being given treatment using mind maps. Therefore, there is no significant difference in the achievement for the mastery of the language aspect of essay writing using mind maps in the post-test mean score for the experimental group is rejected. Improving language proficiency in essay writing aligns with Al-Ghazo's (2015) study on semantic mapping learning strategies in reading comprehension. The findings of his study show that the use of semantic mapping strategies can improve the overall achievement of the text, including aspects of language.

Table 6 <Paired Sample T-test of Language Aspect Proficiency Achievement in Pre and Post-test for the Experimental Group>

	Couple Differences			**t**	**df**	**P**
	Min	**Standard deviation**	**Standard Error**			
Pre -Post-test	-4.817	1.467	0.313	-15.391	20	0.000

There was no significant difference in the achievement for mastery of the technical aspects of essay writing using mind maps in the experimental group's pre and post-test mean scores (Hypothesis 4). In addition to the mastery of content and language aspects, this study also examines whether there are differences in the mastery of essay techniques using mind maps. The mean achievement of the sample is shown in Table 7. Table 7 shows that the mean mastery of the pre-test technique aspect is 9.54 with a standard deviation of 1.370, and the mean achievement of the post-test technique aspect is 12.17 with a standard deviation of 1.139.

Table 7 <Mean Achievement for Mastery of Technical Aspects of Essay Writing of the Experimental Group>

The test	**N**	**Min**	**Standard deviation**
Pre-test	22	9,54	1,370
Post-test	22	12,17	1,139

The difference between these two tests was - 2.637, as shown in Table 8. Based on Table 8, the t-test showed a significant mean difference between pre-test and post-test for the experimental group with t value = -8,257, P <0.05. This significant difference proves that there is an increase in students' mastery of aspects of essay writing techniques after being given treatment using mind maps. Therefore, there is no significant difference in achievement for mastery of aspects of essay writing technique using a mind map in the post-test mean score of the experimental group is rejected. The effectiveness of mind maps in improving aspects of essay writing techniques is in line with Yunus and Chien (2016), which found that mind maps help students plan for essay writing and can also help students make good paragraphs.

Table 8 <Paired Sample T-test of Achievement for Mastery of Pre-and Post-test Technical Aspects for the Experimental Group>

	Couple Differences			**t**	**df**	**P**
	Min	**Standard deviation**	**Standard Error**			
Pre -Post-test	-2.637	1.497	0.318	-8.257	20	0.000

There was no significant difference in the achievement for mastery of the content aspect of essay writing in the post-test mean score between the experimental and control groups (Hypothesis 5). In addition to examining the mastery of the content aspects of pre-and post-experimental essay writing, this study also examines the achievement of mastery of content aspects of post-test writing between the control and experimental groups. The mean achievement is shown in Table 9. Table 9 shows that the mean achievement of the control group sample is 22,13 with a standard deviation of 3,023 and the mean achievement of the experimental group sample is 28,13. Meanwhile, the t-test showed a significant difference between the experimental and control groups, with the t value = -8,100, p <0,05. After being processed using a mind map, improved mastery of the content aspects of essay writing. Therefore, there is no significant difference in the achievement for the mastery of the content aspect of essay writing in the post-test mean score between the experimental group and the control group is rejected.

Table 9 <Paired Sample T-test of Achievement for Mastery of Content Aspects in Post-test Between Experimental Group and Control Group>

Group	N	Min	Standard deviation	t	df	P
Control	21	22.13	3.023	-8.100	41	0.000
Experiment	22	28.13	1.669			

There was no significant difference in the achievement for mastery of the language aspect of essay writing in the post-test mean score between the experimental and control groups (Hypothesis 6). The mean achievement for mastery of language aspects of essay writing for the control group sample and the sample for the experimental group are shown in Table 10. Table 10 shows the mean achievement for post-test language proficiency for the control group sample is 19.23 with a standard deviation of 1.894, and the mean achievement of language aspects for the group sample of the experiment was 22.67 with a standard deviation of 0.994. Meanwhile, the t-test showed a significant difference between the experimental and control groups, with the t value = -7.511, p <0.05. After being processed using a mind map, improved my mastery of the language aspect of essay writing. Therefore, there is no significant difference in the achievement for the mastery of the language aspect of essay writing in the post-test mean score between the experimental group and the control group is rejected.

Table 10 <Paired Sample T-test of Achievement for Post-test Language Aspect Mastery Between Experimental Group and Control Group>

Group	N	Min	Standard deviation	t	df	P
Control	21	19.23	1.894	-7.511	41	0.000
Experiment	22	22.67	0.994			

There was no significant difference in the achievement of mastery of the technical aspects of essay writing in the post-test scheme between the experimental and control groups (Hypothesis 7). Mean mastery achievement for essay writing technique aspects for control group sample and sample for experimental group Table 11. Based on Table 11, the t-test showed a significant change in mastery achievement for essay writing techniques between the experimental and control groups. The mean achievement of mastery of essay writing techniques for the control group sample was 10.66 with a standard deviation of 1.425, and the mean achievement of essay writing techniques for the experimental group was 12.17 with a standard deviation of 1.139. While the t-test also showed a significant difference with a t-value = -3.857, P <0.005. Therefore, there is no significant difference in the achievement for the mastery of aspects of essay writing techniques in the post-test mean score between the experimental group and the control group is rejected.

Table 11 <Paired Sample T-test of Achievement for Mastery of Technical Aspects in Post-test Between Experimental Group and Control Group>

Group	N	Min	Standard deviation	t	df	P
Control	21	10.66	1.425	-3.857	41	0.000
Experiment	22	12.17	1.139			

The findings of this study showed that the sample performance from the experimental group was higher and more significant than the sample from the control group. Therefore, several implications have been identified and considered appropriate and impact the teaching and learning of students. The findings of this study show that mind maps are one of the learning alternatives teachers can use in writing essay lessons. The

use of mind maps can encourage students to think critically and creatively. In addition, by using mind maps, students will be actively involved and create a fun learning environment. The use of mind maps could be fun for students (Bystrova & Larionova, 2015; Shi, Yang, Dou & Zeng, 2022). The use of this mind map can also save time and make it easy to remember (Nast, 2012; Germov, 2020), and the mind map increases its effect if the teaching is done in groups (Siew & Mapeala, 2016; Loc & Loc, 2020; Gavens, Doignon-Camus, Chaillou, Zeitler & Popa-Roch, 2020).

The findings of this study showed that students' performance in the experimental group increased compared to students in the control group by using mind maps. Learning processing using mind maps has been proven to have a positive effect not only on student achievement but also on teachers' teaching. Moreover, this study's implications require teachers to shift from examination-only-centered teaching to teaching that diversifies approaches. In addition, applying mind maps in learning can improve students' essay writing skills and make the learning atmosphere more enjoyable. The study's findings prove that the mind map is an important teaching material for students. Research also proves that visual teaching materials make it easier for students to remember important ideas and make it easier for students to describe them. It is in line with the statement which stated that the graphic materials and pictures are drawn to stimulate thinking, facilitate understanding, and strengthen students' memory (Magolda, 2017; Jensen, McDaniel, Woodard & Kummer, 2014); İbili, Çat, Resnyansky, Şahin & Billinghurst, 2020). In addition, using mind maps as teaching materials will make teaching more exciting and provide space for students to be actively involved. The activity of students in following the teaching is certainly a positive sign of their learning achievements. Teachers' satisfaction with student achievement opens up space to use creativity and learn without feeling bored.

Conclusions

Thinking skills applied to the higher education curriculum are intended so that students can adapt to lifelong learning. Therefore, based on these needs, it shows the importance of teachers being given specific training such as workshops or short courses on the use of mind maps in the teaching and learning of students. The training will provide opportunities for teachers to implement essay writing more effectively. Besides being exposed to traditional mind maps (hand sketches), teachers also need to be exposed to interactive mind maps to make learning more fun. Teachers' exposure to interactive mind maps gives a new dimension to the teaching of essays by placing multimedia elements. This disclosure is necessary not only to ensure the improvement of students' essay writing skills but also to increase the level of professionalism of the teachers themselves. While in the context of the curriculum, the application of various types of essays is necessary to enrich students' knowledge. Accordingly, school textbooks should contain graphic management forms that are already available. Preparing such graphic management forms is intended to facilitate and assist teachers in teaching.

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