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COMPARING STUDENTS' INTEREST AND LEARNING OUTCOMES: DIFFERENTIATED LEARNING IN CONTENT VS PROCESS

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ABSTRACT

The goal of this study is to compare students' interests and learning outcomes when using content and process differentiated learning. To determine the difference, experimental study utilizing a factorial design was used. The purposive samples for this study were students in grades XI F2 and XI F4 who picked English as an elective subject. XI F2 was taught using differentiated learning in process, whereas XI F4 was taught using differentiated learning in content. A questionnaire was utilized to collect data on learning interests, and the data were analyzed using average calculations. Learning outcomes were analyzed using one-way ANOVA. Questionnaires and students' first and second semester learning outcome ratings were utilized as the research instrument for the study. The study found no significant difference in students' interest and learning outcomes between differentiated content and process learning. The result showed that both strategies are equally effective in engaging students and enhancing learning, resulting in similar outcomes. When both strategies were implemented with equal effort, their impacts were not be significantly different. More study is required to look deeper into these findings. Future research could look into the specifics of how various student characteristics, interact with differentiated content and process learning.

Keyword : *Differentiated learning, Learning outcome, Students' interest*

INTRODUCTION

The primary element impacting English learning achievement is an external factor, specifically the student's surroundings (Anisa, H., & Arifmiboy, A., 2021). However, another crucial factor influencing students' achievement is internal, with one key internal factor being students' interest.

The critical necessity of comparing student interest and learning outcomes using differentiated learning in content and process stems from the urgent requirement to properly

respond to varying learning needs within classrooms. Tomlinson, C. A. (2017) emphasizes the importance of differentiated learning in creating inclusive and equitable learning settings where all children can thrive. Despite its established benefits, there remains a considerable gap in empirical research comparing student interest and outcomes when using differentiated learning in content versus process. While numerous studies have investigated the overall efficiency of differentiation (Pozas, M., et.al., 2020; Magableh, I. S. I., et.al., 2014; Donker, A. S., et.al., 2014; Little, C. A., et.al., 2014; Eikeland, I., & Ohna, S. E., 2022), few have looked at the comparative effects of these distinct characteristics. This gap leaves educators without clear guidance on whether to focus on differentiated learning in content or process.

In recent years, the educational landscape has witnessed an increased emphasis on differentiated learning practices to accommodate students' diverse needs. Differentiated learning, a strategy that tailors content, process, and product to individual student needs, has emerged as a critical method in this context (Tomlinson, 2017). This approach aims to increase student interest and improve learning outcomes by addressing different levels of readiness, interests, and learning profiles (Gheyssens, E., et.al., 2022; Reis, S. M., & Renzulli, J. S., 2018).

Empirical research suggests that differentiated learning can significantly boost student interest and learning outcomes. Tomlinson, C. A. (2014) discovered that students in differentiated classrooms demonstrated higher levels of interest and obtained better learning outcomes than their peers in standard settings. The study found that when teachers tailored their educational approaches to their students' diverse needs, students were more motivated and performed better academically (Moon, T. R., et.al., 2020; King, N., & Bunce, L., 2020; Smets, W., et.al., 2022).

Evaluating previous studies about differentiated learning, there is a lack of clarity on whether content or process differentiation is more effective. Faber, J. M., et.al. (2018) found no substantial beneficial effects for differentiated instruction approaches. Morgan, H. (2014) illustrated an example in which differentiated instruction was employed to help a child with learning difficulties. However, these studies did not clearly state which kind of differentiated learning had no significant positive effect for differentiated learning practice.

Referring to the gap in previous studies, this research aims to compare which differentiated learning approach between content and process boosts student interest and learning outcomes. The hypotheses of this research are:

1. There is a significant difference in students' interest and learning outcomes using differentiated content and process;

2. There is no significant difference in students' interest and learning outcomes using differentiated content and process.

By investigating how these techniques affect student interest and learning outcomes, this study hopes to contribute to the expanding body of evidence supporting differentiated instruction. The findings are intended to provide useful insights for teachers seeking to improve students' learning experiences through differentiated teaching approaches.

METHOD

This study is an experiment with a factorial design. Factorial designs are experimental setups in which researchers control two or more variables at the same time to see what happens and how they interact. (Creswell, & Creswell, 2017). In this case, this research aims to find the how the variables interact and influence each other.

Sampling

The study was conducted at SMA Negeri 2 Lintau Buo at Tanah Datar regency. This school was selected as the place of the study because it is one of the first 10 Sekolah Penggerak at West Sumatera Province in implementing Merdeka Curriculum. The purposive sampling of this study were 34 students from class XI F2 and 32 students from class XI F4 because the students take Advanced English as one of their selected subjects. Before the treatment, the samples were checked for homogeneity. The data of homogeneity test were taken from previous summative test. The result of homogeneity was analyzed by using IBM Statistics 20. Homogeneity tests are critical for determining the validity of subsequent statistical studies. For example, in ANOVA, the assumption of equal variances must be met in order to obtain correct findings.

Experimental Design

The factorial design consisted of two classes. They were taught utilizing similar themes and different learning methodologies. Class XI F2 was taught utilizing differentiated learning in process, while class XI F4 was taught with differentiated learning in content. Students in class XI F2 were categorized according to their learning style, whereas students in class XI F4 were grouped according to their readiness. The treatment was applied to the topic Analytical Exposition. There are four meetings each class.

Data Collection and Analysis

At the end of the teaching process, the samples received a questionnaire. The data from the questionnaire were measured using the average calculation from the Likert Scale. There are 25 numbers of item in the questionnaire. Those 25 items are divided into 5 categories. The questionnaire is used to measure student interest by constructing questions and scales that accurately capture the various dimensions of interest in a specific subject or activity such as cognitive interest, emotional interest, and behavioral interest (Renninger, K. A., et.al., 2014)

Furthermore, the data on student outcomes were confirmed using one-way ANOVA. Normality and homogeneity tests, as well as one-way ANOVA, were used in the learning outcomes analysis technique. The purpose of normality test is to determine if the data follow normal distribution. It was tested by using Kolmogorov-Smirnov Test along with Shapiro-Wilk Test. Then, to determine if the variance of the group is equal, homogeneity test is conducted. This study used Levene's Test.

The data satisfies the requirements for a one-way ANOVA by running these homogeneity and normality tests. Fulfilling these presumptions confirms that ANOVA can be used to compare group means, guaranteeing the accuracy and dependability of the findings. One-way ANOVA is used to determine whether there are differences in content and process differentiated learning strategies that influence students' interest and learning outcomes or not.

FINDINGS AND DISCUSSION

Findings

Based on the objective of this study is to compare students' interests and learning outcomes when using content and process differentiated learning, the homogeneity test was conducted. The data were taken from the available test results of two classes. The first data were taken from student interest. There are 25 statements about the student interest which are grouped into 5 parts. The questionnaire used Likert Scale 1 to 5. 1 means Strongly Disagree, 2 is Disagree, 3 means Neutral, 4 means Agree, and 5 is for Strongly Agree. The result of the questionnaire is as follow:

Table 1: The Result of Questionnaire Analysis

Class	Indicator	Mean	Category
Differentiated in process	1. The students like the instruction	4.2	Agree
	2. The students pay attention to the lesson	4.1	Agree
	3. The students are eager to use English	3.8	Agree
	4. The students engage in learning	4.2	Agree

	5. The students like the way teacher delivers the lesson	4.1	Agree
Differentiated in content	1. The students like the instruction	4.3	Agree
	2. The students pay attention to the lesson	3.9	Agree
	3. The students are eager to use English	3.8	Agree
	4. The students engage in learning	4.2	Agree
	5. The students like the way teacher delivers the lesson	4.2	Agree

The table 1 shows data from a survey that asked students about their opinions of two different teaching approaches: differentiated process and differentiated content. The table is organized into two major sections, each reflecting one of these instructional methods. The first section discusses the differentiated process approach. Five metrics were used to assess students' responses:

1. The students like the instruction.
2. The students pay attention to the lesson.
3. The students are keen to use English.
4. The students engage in learning.
5. The students like how the teacher presents the lesson.

For each indicator, the mean score (on an undetermined scale) is presented along with a categorical grade of "Agree." The mean ratings vary between 3.8 and 4.2, indicating a generally positive response. Specifically, students agreed strongly with the lesson and engaged in learning (both scoring 4.2), whereas the lowest score (3.8) was for readiness to utilize English.

The second phase examines the differentiated content approach using the same five indications used in the differentiated process. Again, each indicator is assigned a mean score and a categorical grade of "Agree." The average score in this section ranges from 3.8 to 4.3. The greatest score (4.3) shows that students strongly agree that they like the instruction, whilst the lowest scores (3.8) relate to students' enthusiasm to use English and pay attention to the lesson.

When comparing the two teaching approaches, the differentiated content method earned a slightly higher mean score for instruction liking (4.3 vs. 4.2) and lesson delivery style (4.2 vs. 4.1). However, both methods produced equal results for students' enthusiasm to use English (3.8) and participation in learning (4.2). This implies that, while there are modest differences in individual areas, generally student perceptions of the two teaching styles are very comparable, with both strategies receiving good feedback.

In summary, the table shows that students usually agree that they enjoy the instruction, pay attention to the lessons, are eager to use English, participate in learning, and value how the teacher presents the lessons in both differentiated process and differentiated content groups. Consistent agreement across variables demonstrates the efficacy of both differentiated teaching styles in creating a positive learning environment.

Table 2: Normality Test

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest XIF2	.091	30	.200*	.988	30	.973
Postest XIF2	.132	30	.191	.952	30	.196
Pretest XIF4	.145	30	.110	.971	30	.572
Postest XIF4	.127	30	.200*	.962	30	.358

a. Lilliefors Significance Correction

The result of the normality test can be seen that the sig.value is bigger than the alpha (sign.>0.05) in both Kolmogorov-Smirnov and Shapiro-Wilk. This means that the data was distributed normally. In the Kolmogorov-Smirnov Test, all datasets have a significance level greater than 0.05. The pretest control and posttest experiments, in particular, had a significance value of 0.200 after using the Lilliefors Significance Correction, giving a strong hint of normality. The posttest control and pretest experiments show significantly lower significance values (0.191 and 0.110, respectively), but they are still greater than 0.05.

In the Shapiro-Wilk Test, all datasets have significance values larger than 0.05, which supports the assumption of normality. The pretest control has a very high significance value of 0.973, indicating good normality, however the posttest control has a lower value of 0.196, which is still above the threshold. The pretest and posttest experiment results are 0.572 and 0.358, respectively, indicating a normal distribution.

Table 3: Test Homogeneity of Variances

Learning Outcomes			
Levene Statistic	df1	df2	Sig.
,029	1	58	,866

The result of homogeneity of variance is 0.866 >0.005. The null hypothesis of Levene's test is accepted since the significance level is substantially higher than 0.05 (0.866). This suggests that there is no significant difference in the variances of learning outcomes between

the groups under consideration. In other words, the learning outcomes satisfy the variance homogeneity assumption. This is critical for subsequent statistical studies, especially ones that assume equal variances, such as ANOVA (Analysis of Variance). The findings show that the learning results across the groups are statistically similar in terms of variance, allowing for more accurate and trustworthy comparisons via parametric testing.

Tabel 4: The Result of One-Way ANOVA

Learning Outcomes

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	220.417	1	220.417	2.075	.155
Within Groups	6161.233	58	106.228		
Total	6381.650	59			

The table 4 displays the analysis of variance results for learning outcomes. The "Between Groups" sum of squares (220.417) represents the variability in learning results due to group differences. The "Within Groups" sum of squares (6161.233) reflects the heterogeneity within each group. The total sum of squares (6381.650) represents the sum of the variances between and within groups.

The mean square is obtained by dividing the sum of squares by the degrees of freedom. The mean square between groups is 220.417, whereas within groups it is 106.228. The F-value (2.075) represents the ratio of the between-groups mean square to the within-groups mean square. This value is used to see if there is a substantial difference between the group means. The significance level (sig.) is 0.155. A standard criterion for significance is 0.05. Because 0.155 is more than 0.05, we cannot reject the null hypothesis.

The findings of the one-way ANOVA show that there is no statistically significant difference in group means for learning outcomes (Sig. = 0.155). This signifies that the difference in learning outcomes between groups is insufficient to be regarded statistically significant at the 5% level. In other words, any disparities in learning outcomes between groups are most likely due to random chance rather than a systematic effect of the group factor. This result is essential for educators and researchers because it implies that the intervention or condition implemented across the groups had no meaningful impact on learning outcomes.

Discussion

The most notable finding from the questionnaire analysis is that students consistently agreed on their positive evaluations of both differentiated teaching strategies. The mean scores for all indicators in both the differentiated process and differentiated content groups fell into the "Agree" category, ranging from 3.8 to 4.3. This consistency demonstrates the efficacy of these teaching strategies in a variety of areas of the learning experience, including enjoyment of instruction, attention to lessons, enthusiasm to use English, interest in learning, and admiration for teacher delivery. The result of this research area is supported by other previous research that there was a significant and positive relationship between case-based learning and all four aspects of interest, i.e. behavioral, emotional, cognitive and agentic interest, was observed statistically (Raza, S. A., et.al., 2020).

While the technique used in this study has confidence and designed to properly answer the research questions, many limitations must be addressed. These limitations, such as potential biases in self-reported data from questionnaires. The sample might not have chosen the responses honestly. It could be due to their reserved attitude toward their teacher. This condition may have an effect on the findings' validity and generalizability.

These findings are crucial because they emphasize the importance of differentiated learning, which tailors teaching methods to match students' unique requirements. Previous research indicates that differentiated learning can improve student interest and learning outcomes by addressing individual learning styles and preferences (El-Sabagh, H. A., 2021; Smale-Jacobse, et.al., 2019; Dixon, F. A., et.al., 2014). The current study's findings are consistent with this body of research, suggesting that differentiated learning in process and content approaches are well welcomed by students and may contribute to a more positive and successful learning environment.

This investigation provided several fresh insights. First, the study found that differentiated learning in content and process is consistently successful across numerous dimensions of the student experience, not just one or two. This comprehensive effectiveness implies that differentiated learning in content and process might be a powerful method for enhancing classroom dynamics and student interest.

Second, the one-way ANOVA findings revealed no statistically significant differences in learning outcomes across the groups ($p = 0.155$). This shows that, while students rate both teaching techniques positively, these impressions do not always transfer into measurable differences in learning results. This insight emphasizes the complexities of educational interventions and the need to examine numerous elements when assessing their efficacy. So,

this study proves the hypothesis that there is no significant difference between students' interest and learning outcomes using differentiated content and process.

A thorough investigation is required to understand the potential explanations for this finding, as well as how they align or differ from previous research. There are some potential reasons to this finding. First, both differentiated content and differentiated process attempt to meet the requirements of individual students by adapting instruction to their readiness levels, interests, and learning styles. Second, differentiated content may provide the necessary support by presenting materials that match students' existing understanding, whereas differentiated process may accomplish the same by modifying teaching techniques. As a result, both strategies may provide equivalent reinforcement for interest and comprehension. Then, the instruments used to assess student interest and learning outcomes may not be sensitive enough to identify slight changes between the two differentiation strategies. For example, if the questionnaire items are not sufficiently detailed to capture the distinct advantages of different content versus process, the findings may show a lack of substantial differences where they do exist. Finally, according to Prince, F. G. (2021), variability in instructors' competency with differentiated education, as well as inconsistency in applying the strategies, may result in mixed outcomes which hide potential distinctions. Furthermore, classroom dynamics and students' diverse backgrounds may influence the efficiency of each method in unexpected ways.

Future research should explore the impact of differentiated learning methodologies on different demographics, comparing urban, suburban, and rural schools to understand how socioeconomic status, cultural background, and resources influence success. The other consideration is longitudinal study design can evaluate the long-term effects of differentiating learning strategies on student interest and outcomes, revealing changes in students' needs and preferences, enabling educators to tailor their strategies.

CONCLUSION AND SUGGESTION

The study investigated the effectiveness of different learning strategies, with a focus on content and process differentiation, in increasing student interest and learning outcomes. The results showed no significant differences between the two approaches, implying that both are equally effective at engaging students and boosting their learning outcomes. This outcome emphasizes differentiated instruction's variety and adaptability in serving the needs of various students. Future study should look into these strategies in different contexts and populations to improve and enhance differentiated instruction approaches. To enhance student interest and

learning outcomes, teachers should incorporate both content and process differentiation into their instruction.

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