The Influence of Differentiated Learning on Motivation and Economic Learning Outcomes of Class XI Students at SMA Negeri 6 Surakarta

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Abstract:

This research aims to determine the effect of implementing differentiated learning on the motivation and Economic learning outcomes of class XI students at SMA Negeri 6 Surakarta. This study is experimental research utilizing a Pretest-Posttest Control Group Design. The sampling technique used was purposive sampling and using class XI F-6 as the experimental class and XI F-10 as the control class. Data collection techniques were carried out using questionnaire instruments, pretest and posttest. Data analysis included assumption test such as normality and homogeneity tests before hypothesis testing is carried out using the independent sample T-test. The results show that (1) differentiated learning has a significant influence on the learning motivation as indicated by the acquisition of a significance value (Sig. 2 tailed) 0,001 < 0,05; (2) differentiated learning has a significant influence on the learning outcomes as evidenced by the acquisition of a significance value (Sig. 2 tailed) with an average posttest value of 0,000 < 0,05. This research can contribute to the development of education related to the topic of differentiated learning. In addition, this research provides novelty in improving the quality of Economic learning through adjusting learning method based on student's interests, needs, and learning readiness to improve motivation and learning outcomes. Researchers hope that future research can be expanded by using other factors to improve the influence of differentiated learning on motivation and learning outcomes.

Keywords: Differentiated Learning, Motivation Learning, Student Learning Outcomes

Introduction

In the 21st century education encourages students to have cognitive abilities or knowledge in realizing the understanding of relevant material in accordance with their era. The quality of education in a country can be reflected by the quality of the learning system used (Sitorus et al., 2022). In line with this opinion, the implementation of the *Kurikulum Merdeka*, which is currently carried out by educational units, has a crucial role because it focuses on providing freedom and opportunities for students

to improve their ability to think and innovate in learning activities that can be carried out actively, independently and creatively (Aguanda et al., 2023). Students are expected to be able to develop their understanding and competence in preparing for the growing demands of education. Over time, aspects of student motivation and learning achievement can be referred to as important factors to achieve the specified educational standards (Tokan & Imakulata, 2019).

Learning motivation is an encouragement that comes from inside and outside a student to achieve a goal (Anggryawan, 2019; Lin et al., 2021). In learning activities, the existence of learning motivation owned by students provides encouragement in the development of learning activities carried out. However, as students entering the secondary education phase, their learning motivation decreases, due to developmental factors that occur in adolescence (Schweder & Raufelder, 2024). Students are less proactive in learning activities and tend to shift their focus and concentration in learning.

The achievement of learning objectives obtained by students can be represented through learning outcomes. Learning outcomes can be referred to as an achievement that students have achieved academically through various activities in learning (Dakhi, 2020). Learning outcomes can represent the organization of the education system in achieving planned learning objectives (Asim et al., 2021). Based on a document study conducted by the author, it can be seen that the completeness of the Economics learning outcomes of grade XI students at SMA Negeri 6 Surakarta is shown in Table 1 below:

Table 1. Data on the completeness of Economic Learning Outcomes

Class	Average Test Score	Completeness (%)
XI F-6	68	29
XI F-7	74	54
XI F-8	75	47
XI F-9	80	59
XI F-10	64	33
XI F-11	71	40

Source: SMA Negeri 6 Surakarta, 2024

The document study conducted by the researcher shows that the achievement of learning outcomes through daily tests on Economics subjects carried out by class XI students of SMA Negeri 6 Surakarta is still in the low category. This can be shown from the acquisition of learning outcomes of grade XI students at SMA Negeri 6 Surakarta there are still 4 out of 6 classes with a completeness value below 50%. In addition, the results show that class XI F-6 and XI F- 10 are the classes with the lowest completeness scores because there are still many students who have not reached the Criteria for Achieving Learning Objectives in the daily tests of Economics subjects in both classes. Therefore, there

needs to be an effort to improve the completeness of the Economics learning outcomes of students in class XI of SMA Negeri 6 Surakarta.

In supporting the quality of learning, teachers as facilitators play a role in facilitating students to understand learning materials with easier and more effective strategies. Therefore, the urgency of this research encourages the realization of improving the quality of learning Economics through learning experiences and understanding complex economic concepts with teaching methods that suit the student needs. This supports the application of differentiated learning because it has urgency as a new strategy in learning according to the implementation of curriculum Merdeka in accommodating the different needs, interests, and learning profiles of students (Dwiputra et al., 2023). Therefore, the application of differentiated learning can be a solution in facilitating student diversity in learning activities to realize the achievement of learning outcomes and encourage increased student learning motivation (Sitorus et al., 2022; Hamidah & Oktaviani, 2023). Differentiated learning is a proactive approach that can combine inclusive strategies in creating learning experiences so that they can be customized and fulfill the needs, interests and learning profiles of students in the classroom (Langelaan et al., 2024). In addition, differentiated learning includes varied learning resources with strategies and ways to represent the material to facilitate students in learning activities (Tobin & Tippett, 2014). Differentiated learning strategies carried out in the form of content, process, and product differentiation prove their benefits in increasing student learning activeness, creativity development and learning outcomes (Santangelo & Tomlinson, 2009; Nawati et al., 2023). Therefore, researchers are interested in conducting research in Economics learning which aims to (1) determine the influence of differentiated learning on student learning motivation, (2) determine the influence of differentiated learning on student learning outcomes.

Literature Review

Learning motivation is an encouragement in the learning process from within students to achieve goals and learning outcomes (Anggryawan, 2019). Motivation has an important role in providing reinforcement, persistence, and clarifying goals in learning activities (Lagili et al., 2019). In fostering motivation and encouragement of learning to students, teachers have a role in meeting the learning needs of each student using differentiated learning. This is because motivation is one of the factors that make students more eager to learn and encourage high curiosity (Schweder & Raufelder, 2024).

Learning outcomes can be interpreted as the student's learning achievement based on predetermined criteria and values (Dakhi, 2020). Learning outcomes can be described into several aspects such as aspects of knowledge or understanding, skills, and attitudes (Mandagi et al., 2023). Assessment of aspects of knowledge or understanding can be referred to in the cognitive domain. Tomlinson & Moon (2014) argue that in differentiated learning allows teachers to understand student development and use best practices to enhance their growth in aspects of readiness, interest, and learning approaches used. Differentiated learning can help students to achieve optimal learning outcomes because teachers assess the products produced according to the interests of each student (Herwina, 2021).

The theories used in this research are constructivism and humanism learning theories. Constructivism learning theory helps students to develop higher levels of cognition based on understanding concepts and learning experiences that are relevant to real life (Tsai et al., 2023). Meanwhile, the use of humanism learning theory in this differentiated learning activity can support the creation of critical, creative, and innovative thinking skills for each student by recognizing students' needs in learning activities (Li & Ma, 2023).

Khasanah & Alfiandra (2023) and Suhesti et al (2023) in their research show that the application of differentiated learning has a positive and significant effect on learning motivation. Other research conducted by Prast et al (2018); Herwina (2021); and Asriadi et al (2023) shows that differentiated learning has an influence in improving learning outcomes. However, in the application of differentiated learning there are still challenges such as requiring a long time to achieve learning objectives (Siam & Al-natour, 2016). Another research conducted by Iterbeke et al (2020) also showed differences with the results of previous studies which revealed that the average student learning outcomes were not affected by the application of differentiated learning. The difference in the results of previous research underlies the research to determine the effect of the application of differentiated learning on the motivation and learning outcomes of grade XI students at SMA Negeri 6 Surakarta which focuses on learning Economics. Based on this, the hypothesis is formulated as follows:

H1 : There is a significant influence of differentiated learning on the motivation of Economics learning of grade XI students of SMA Negeri 6 Surakarta.

H2 : There is a significant influence of differentiated learning on the Economic learning outcomes of grade XI students of SMA Negeri 6 Surakarta.

Research Methodology

This research was conducted at SMA Negeri 6 Surakarta using experimental method with of Pretest-Posttest Control Group Design. This research was conducted by giving treatment in the form of differentiated learning in the experimental class, meanwhile the control class was given conventional learning as done by the Economics subject teacher. The Pretest-Posttest Control Group Design research design can be seen in Table 2 below.

Table 2. Research Design

Class	Pre-test	Treatment	Post-test
Experiment	O_1	X	O_2
Control	O_3		O_4

Source: Sugiyono, 2017

Description

O_1 : Pretest in the experimental class

O_2 : Posttest in the experimental class

O_3 : Pretest in control class

O_4 : Posttest in control class

X : Application of learning Differentiated learning

This study uses differentiated learning variable (X) as the independent variable by combining the learning motivation variable (Y_1) and learning outcomes (Y_2) as the dependent variable. This study used the population of all students of class XI F-6 to XI F-11 which amount to 201 students. In addition, this study used purposive sampling technique and used class XI F-6 which amounted to 32 students and class XI F-10 which amounted to 31 students as research samples. This sampling is based on the similarity of the problem, namely the low motivation and learning outcomes of students in both classes.

The data collection technique in this study used the distribution of questionnaires to measure learning motivation variables. The number of question items on this questionnaire totaled 12 items with measurements using a Likert scale of 1-7. The use of questionnaire instruments was adapted from the MSLQ developed by Duncan & Mckeachie (2010). Meanwhile, the test method in the form of pretests and posttests in the form of multiple choice was used to measure student learning outcomes variables.

Data analysis includes assumption tests such as normality and homogeneity tests before hypothesis testing using independent sample T-test. The data collected in this study were then analyzed using the independent sample T-test to compare the difference in the mean scores of the experimental and control classes.

Results and Discussions

Data Processing of Research Results

Validity and Reliability Test

In the questionnaire test carried out by the product moment correlation method, the criteria are determined if $r_{count} > r_{table}$ then the instrument is called valid. Based on the validity test conducted on 30 respondents outside the research sample included in one population, the r_{count} value ranges from 0,571 – 0,876 which is greater than the r_{table} whose value is 0,361. Meanwhile, the reliability test is determined if the Cronbach's Alpha value is ≥ 0,6 the research instrument is considered reliable. In the reliability test, the Cronbach's Alpha value was 0,942 so that the questionnaire instrument was reliable. In addition, the pretest and posttest instruments were tested for content validity to compare the content of the test instrument with the learning material, also the test of difficulty level and distractor analysis.

Learning Motivation

The data used in this research were obtained from the experimental class which was given treatment differentiated learning approach and the control class with a conventional learning approach. This study used respondents in the experimental class with a total of 32 students. Meanwhile, the control class had 31 students. As for the first step to identify the interests and learning needs of each student before the application of differentiated learning in the experimental class, the teacher conducted a learning style mapping through the akupintar.id website to find out the tendency of students' learning styles. The distribution of learning styles can be viewed in table 3 below.

Table 3. Distribution of Learning Styles of Experimental Class Students

Learning Style	Total	Percentage (%)
Visual	14	43,75
Auditory	8	25
Kinesthetic	10	31,25
Total Students	32	100

Source: Data Processed, 2024

Learning motivation data from the distribution of questionnaires in the experimental and control classes can be shown in table 4 below:

Table 4. Learning Motivation Data Distribution

Learning Motivation		
	Experiment Class	Control Class
N	32	31
Mean	67,78	62,42

Distribution of Learning Motivation Indicators		
Intrinsic Goal Orientation	16,6%	16,3%
Extrinsic Goal Orientation	17,0%	17,6%
Task Value	16,8%	16,7%
Control of Learning Beliefs	17,0%	16,9%
Self-Efficacy	15,5%	16,7%
Test Anxiety	17,1%	15,8%

Source: Data Processed, 2024

Meanwhile, trends in learning motivation variable data in experimental and control classes can be identified using the mean value and standard deviation (sd) which are formulated as follows:

1) High category : X ≥ mean + sd

2) Medium category : (mean - sd) < X < (mean + sd)

3) Low category : X ≤ mean – sd

Table 5. Trend of Learning Motivation Data Distribution

Category	Frequncy	
	Experiment	**Control**
High	7	5
Medium	20	18
Low	5	8
Total Students	32	31

Source: Data Processed, 2024

Based on the data distribution, it is obtained that the trend of learning motivation in the experimental class shows higher results than the control class. In addition, the tendency of student learning motivation in the experimental class is in the moderate category and is contributed by indicators of intrinsic goal orientation, task value, control of learning beliefs, and test anxiety.\

Student Learning Outcomes

Data on student learning outcomes are measured using a pretest to determine student abilities before being given treatment and a posttest to measure students final abilities after being given treatment. The data distribution of pretest and posttest results can be shown in table 6 below:

Table 6. Learning Outcomes Data Distribution

Learning Outcomes		
	Experiment Class	**Control Class**
Pretest	50,78	50,48
Posttest	74,22	60,16

Source: Data Processed, 2024

Normality Test

Normality test was conducted through Kolmogorov Smirnov method with α of 0,05. Based on the normality test, the significance value of learning motivation data in the experimental class was 0,200 and the control class was 0,072. From the test results it can be seen that the significance value (Sig.) in the experimental class and control class > 0,05 so that the data distribution is normal.

Meanwhile, the normality test of the pretest and posttest in the experimental and control classes obtained the results of the experimental class pretest significance value of 0,151> 0,05 and the experimental class posttest of 0,061> 0,05. This shows that the distribution of pretest and posttest data of the experimental class is normally distributed. Meanwhile, in the control class, the pretest data obtained a significance value of 0,133> 0,05 and the control class posttest 0,200> 0,05, which means that the distribution of the pretest and posttest of the control class was considered normally distributed.

Homogeneity Test

Based on the homogeneity test through the Levene's statistical method, the significance value based on the mean on the learning motivation variable is 0,879> 0,05. It can be concluded that the learning motivation data in the experimental class and control class are the same or homogeneous. Meanwhile, based on the homogeneity test of learning outcomes, the significance value based on mean shows a value of 0,485> 0,05. Therefore, it can be concluded that the data on economic learning outcomes in the experimental and control classes are the same or homogeneous.

Independent Sample T-Test

The independent sample T-test was used to statistically compare differences in the mean scores of two groups (Gerald, 2018). In this test, the learning motivation data in the experimental class and control class showed a Sig. (2 tailed) of 0.001 <0.05 so that H_0 is rejected and H_1 is accepted. In addition, the learning motivation data also shows the results of the $t_{count} > t_{table}$ value, which is 3.369> 2.000 so that there is an influence of differentiated learning on student learning motivation in experimental and control classes.

Meanwhile, the independent sample T-test test on the posttest value is used to determine the effect of the application of differentiated learning on student learning outcomes in the experimental class and student learning outcomes in the control class given conventional learning. Based on the independent sample T-test test to determine the final understanding of students after being given treatment, the results of the $t_{count} > t_{table}$ value can be obtained with a value of 4.287> 2.000. In addition, the results of the Sig. (2 tailed) shows a result of 0.000 <0.05 so that H_0 is rejected and H_2 is accepted.

Discussions

The Influence of Differentiated Learning on Economic Learning Motivation of Class XI Students at SMA Negeri 6 Surakarta

The results of the research prove that the first hypothesis (H_1) is accepted, which is the application of differentiated learning has a significant effect on the Economic learning motivation of grade XI students at SMA Negeri 6 Surakarta which is supported by the acquisition of Sig. (2 tailed) of 0.001 ≤ 0.05 and the t_{count} value shows results more than the t_{table}, namely 3.369> 2.000. This shows that there is a difference in the results of student learning motivation in classes that are treated in the form of differentiated learning with classes that use conventional learning. The trend of learning motivation obtained by experimental class students shows higher results compared to the trend of learning motivation in the control class and is in the moderate category.

In practice, teachers carry out differentiated learning in experimental classes with a process differentiation strategy carried out by providing learning assistance to groups of students with categories of students who do not understand the material, students who understand some of the material and students who understand the whole material. In addition, the product differentiation provided by the teacher is that students are given assignments according to differences in student learning style groups. In implementing this differentiated learning, the teacher's role is to encourage students to have an interest in learning the material so that it can encourage students' curiosity. In addition, the implementation of differentiated learning is carried out to encourage active participation of students in activities to develop their potential and interest in learning individually or collaboratively with other students in one group according to the diversity of student characteristics which is closely related to the values of humanism learning theory (Halimah et al., 2023).

This opinion is also reinforced by Neuville et al (2007) which revealed that the influence of differentiated learning on student learning motivation in experimental classes was influenced by the contribution of several indicators such as (1) intrinsic goal orientation indicators which represent that experimental class students have an intensive to learn learning material because of the ideals and desires to be achieved and come from within themselves, (2) students' perceptions related to task value that the achievement of the results of assignments or projects given by the teacher has a use in learning activities carried out by students, (3) the existence of student awareness in the process of learning activities (control of learning beliefs) is believed to help students encourage understanding and learning a material given by the teacher, (4) test anxiety indicators cause students to be vulnerable to experiencing fear in feeling

failure and getting bad results on a test or assessment given by the teacher. This can encourage students to be more enthusiastic in learning activities so as to increase understanding and mastery of the material.

Research conducted to determine the effect of differentiated learning carried out in class XI economic learning at SMA 6 Surakarta in practice has not been carried out optimally due to time constraints and lack of program planning. This is supported by the opinion of Santangelo & Tomlinson (2009) and Aguanda et al (2023) who revealed that the preparation and implementation of differentiated learning requires a lot of time, energy, and the contribution of various parties to encourage differentiated learning to work effectively. However, this research can prove previous research conducted by Khasanah & Alfiandra (2023) and Suhesti et al (2023) which revealed that there is a positive and significant effect of differentiated learning on student learning motivation.

The Influence of Differentiated Learning on Economic Learning Outcomes of Class XI Students at SMA Negeri 6 Surakarta

The results of this research support the second hypothesis (H_2) which shows that there is a significant influence of differentiated learning on the economic learning outcomes of class XI students at SMA Negeri 6 Surakarta as evidenced by the acquisition of Sig. (2 tailed) shows the result of 0.000 ≤ 0.05 and the t_{count} value is more than the t_{table} with a value of 4.287> 2.000. In this Economic learning, teachers strive to facilitate student diversity by implementing differentiated learning to adjust students' interests and learning needs. Teachers strive to provide assistance and instructions adapted to student groups according to visual, auditory, and kinesthetic learning styles to facilitate differences in student learning abilities. Siam & Al-natour (2016) revealed that the implementation of differentiated instruction is important to minimize differences in learning needs and disabilities.

In this research, teachers encourage the values in constructivism learning theory to be developed by students, especially in economic learning. This is reinforced that according to the theory of constructivism learning proposed by Vygotsky, the development of knowledge starts from the construction of social understanding to develop at the individual level (Amineh & Asl, 2015). Therefore, in the application of differentiated learning in this economics lesson, teachers encourage students in group discussions that are more active and collaborative in developing understanding of concepts and implementation of learning materials in life according to their learning profile. It encourages students with different learning readiness to be motivated in developing their mindset and understanding more deeply based on their thinking, participation and learning experience to achieve optimal learning outcome.

Herwina (2021) revealed that the achievement of optimal learning outcomes through differentiated learning because the products produced by students can be adjusted to their learning

interests. In an effort to facilitate the differences and diversity of these students, differentiated learning is expected to have a positive impact on improving learning outcomes. The above test is in line with previous research conducted by Dalila et al (2022) and Asriadi et al (2023) which states that there is a significant influence of differentiated learning on learning outcomes. Iterbeke et al (2020) also revealed that the use of differentiated learning in the classroom can be an effective instrument for teachers to meet the diverse needs of students in learning.

Conclusion

The results prove that the implementation of differentiated learning has a significant influence on the motivation and learning outcomes of Economics class XI students at SMA Negeri 6 Surakarta. However, the increase in student learning outcomes is still in the medium category. This reveals that the implementation of differentiated learning has not been carried out optimally and need to use other factors to maximize differentiated learning. The implementation of collaboration and evaluation in the implementation of differentiated learning needs to be done to improve and maximize planning for differentiated learning practices in the future.

This research has limitations in the used of learning outcome variables that focus on the cognitive domain. Therefore, future research is expected to be complemented with learning outcome variables in the affective and psychomotor domains. The use of other factors can be added to increase the implementation of differentiated learning so that it can work optimally. Adjustment of subject matter variations with the use of effective and efficient learning strategies needs to be carried out by teachers to optimize the increase in student motivation and learning outcomes in Economics subjects.

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