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The Influence of Differentiated Learning Implementation and Social Emotional Competence on Learning Motivation and Chemistry Learning Outcomes of Class X Students of SMA Negeri 2 Totikum Banggai Kepulauan

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A B S T R A C T

This study is a quasi-experimental study aimed at determining the effect of differentiated learning and social emotional competence on the motivation and learning outcomes of chemistry students of class X SMA Negeri 2 Totikum, Banggai Kepulauan. The sample was selected randomly, namely class XB as the experimental class (24 students) and XA as the control class (25 students). The instruments used were learning motivation questionnaires (pretest and posttest) and social emotional competence questionnaires. Data were analyzed using the independent sample t-test. The results of the analysis showed that differentiated learning had an effect on learning motivation, but not on learning outcomes. Meanwhile, social emotional competence had a significant effect on students' learning motivation.

INTRODUCTION

Education is a fundamental aspect of human life that plays an important role in developing the potential, character, and competence of students. Every individual has the right to receive meaningful and quality education, which not only transfers knowledge but also forms 21st century skills. Therefore, the learning process must be designed actively and centered on students so that they are optimally involved in learning activities.

However, the reality in the field shows that learning is still dominated by conventional approaches, where teachers deliver materials uniformly without considering the diversity of characteristics, interests, and learning needs of students. As a result, most students feel bored, unmotivated, and show low learning outcomes. This also happens at SMA Negeri 2 Totikum, where the chemistry learning process has not fully adjusted to the diversity of student abilities. Many students are not focused on learning and are more interested in other activities such as playing with cellphones or chatting in class.

To overcome these problems, a differentiated learning approach is one of the innovative solutions. Differentiated learning allows teachers to adjust learning strategies based on the readiness, interests, and learning styles of students. By creating a varied and adaptive learning atmosphere, students will be more interested and motivated to actively participate in the learning process.

In addition to learning methods, internal factors such as social emotional competence also play an important role in the learning process. Social emotional competence includes students' ability to manage emotions, establish positive social relationships, and make decisions responsibly. These skills affect how students motivate themselves, interact in the school environment, and respond to challenges in learning.

Motivation and learning outcomes are two main indicators of success in the educational process. High motivation encourages students to study harder, while learning outcomes show the extent to which students have mastered the competencies taught. According to Suti (2011) in Hariri (2024), learning outcomes are the basis for improving the quality of education as a whole.

Based on these problems, researchers are interested in further examining the effect of the implementation of differentiated learning and social emotional competence on the motivation and learning outcomes of chemistry of class X students at SMA Negeri 2 Totikum, Banggai Kepulauan. This study is expected to contribute to designing more effective and humanistic learning strategies.

THEORETICAL REVIEW

Differentiated Learning

Differentiated learning is an instructional approach designed to adapt learning to the individual needs of students. Tomlinson in Ramdhani, Sarifudin, and Darmawan (2024) states that differentiated learning is a learning process that seeks to meet students' learning needs according to their readiness, interests, and learning profiles. Purba (2021) explains that in its implementation, teachers can manage four main elements in differentiated learning, namely content, process, product, and learning environment. This approach places students as active subjects in learning and helps them feel personally cared for. In this context,

differentiated learning is seen as being able to increase learning motivation and adapt learning strategies to the diversity of abilities in the classroom.

Social Emotional Competence (SEC)

Social emotional competence (SEC) is a set of skills that include self-awareness, emotional management, social awareness, relationship skills, and responsible decision-making. In Module 2.2 of the Teacher Mover Program (2023), it is explained that SEC is very important because it relates to how individuals understand and manage emotions, build positive relationships, and make ethical and responsible decisions. This competence has a direct impact on student behavior in learning and social contexts. High SEC allows students to adapt well to the learning environment, cope with academic pressure, and collaborate effectively with peers and teachers. Therefore, SEC is one of the internal factors that influences motivation and learning outcomes.

Motivation to Learn

Learning motivation is an internal or external drive that drives someone to carry out learning activities in order to achieve certain goals. According to Setyowati and Widana in Widarta (2020), motivation is the force that drives someone to behave and complete their tasks. In the context of learning, motivation is very important because it is the main foundation for students in maintaining interest, perseverance, and consistency in learning. Indicators of learning motivation include the desire to succeed, drive and need for learning, hopes and ideals, appreciation in learning, and a conducive learning environment. High learning motivation encourages students to be actively involved in the learning process and achieve optimal learning outcomes, especially in challenging subjects such as chemistry.

Chemistry Learning Outcomes

Chemistry learning outcomes are the achievements of students after following a learning process that includes three domains: cognitive, affective, and psychomotor. Learning outcomes are an important indicator in assessing the success of a learning process. According to Suti (2011) in Hariri (2024), learning outcomes are used to improve the quality of education because they reflect the extent to which learning objectives have been achieved. In the context of chemistry subjects, learning outcomes reflect students' ability to understand abstract concepts, conduct experiments, and demonstrate scientific attitudes during the learning process. Low learning outcomes are often related to low motivation, the use of non-varied methods, and suboptimal social emotional abilities of students in managing their learning process.

METHODOLOGY

This type of research is quasi-experimental and uses quantitative methods. This research was conducted in the Odd Semester of the 2024/2025 Academic Year at SMA Negeri 2 Totikum located on Jalan Trans Peling, Kombutokan Village, Totikum District, Banggai Islands Regency, Central Sulawesi Province.

The population in this study were all class X students of SMA Negeri 2 Totikum in the 2024/2025 academic year consisting of 2 classes. The data analysis techniques used for learning motivation data and student chemistry learning outcomes data in this study were descriptive statistical analysis and inferential analysis.

RESEARCH RESULTS

The results of the study obtained data on chemistry learning motivation for both the control group and the experimental group are shown in Table 1.

Table 1. Student Learning Motivation Data Based on Differentiated and Undifferentiated Learning

Data	Differentiate		Without Differentiation	
	Beginning	End	Beginning	End
Number of Students	24	24	25	25
Lowest Value	60	65	61	64
The highest score	94	97	94	90
Average	81.79	82.63	79.32	77.20
Standard Deviation	9,793	10,227	7,386	6,245

Based on Table 1, it can be seen that the average value of initial motivation of 25 students in the control group (without differentiation) is 79.32 with the lowest value of 61 and the highest of 94. The average value of initial learning motivation in the experimental group (differentiated) of 24 students is 81.79 with the lowest value of 60 and the highest of 94. The average value of final learning motivation in the group without differentiation is 77.20 with the lowest value of 64 and the highest of 90, while in the differentiated group the average value of final learning motivation is 82.63 with the lowest value of 65 and the highest value of 97. Data on student learning motivation is also seen based on student social emotional competencies as shown in Table 2.

Table 2. Pretest and Posttest Data on Learning Motivation Based on Social Emotional Competence

	N	Minimum	Maximum	Average	Std. Deviation
Pretest KSE High	29	72	94	84.24	6,440
Posttest KSE High	29	69	97	83.24	7,895
Pretest KSE Low	20	60	94	75.15	8,738
Posttest KSE Low	20	64	95	74.95	7,756

Based on Table 2, it can be seen that the average value of learning motivation of students who have high social emotional competence during the pretest was 84.24 with a minimum value of 72 and a maximum value of 94, while the minimum value of learning motivation during the posttest was 69 and a maximum value of 97 with an average of 83.24.

An overview of the data on the chemistry learning outcomes of class X students of SMA Negeri 2 Totikum Banggai Kepulauan can be presented in Table 3

Table 3. Student Learning Outcome Data Based on Differentiated Learning and Without Differentiated Learning

Data	Differentiate		Without Differentiation	
	Pretest	*Posttest*	*Pretest*	*Posttest*
Number of Students	24	24	25	25
Lowest Value	56	64	57	61
The highest score	87	94	87	90
Average	70.17	75.88	71.12	72.12
Standard Deviation	9,902	9,110	8,866	8,151

Table 3 shows that the learning outcomes of students in the experimental group where differentiated learning was applied experienced a greater increase compared to the control group without differentiated learning.

Learning outcomes are also grouped based on students' social emotional competencies. Based on data obtained from the research results, students with high social emotional competencies have higher learning outcomes than students with low social emotional competencies. Data on students' chemistry learning outcomes based on students' social emotional competencies can be seen in Table 4.

Table 4**.** Learning Outcome Data Based on Social Emotional Competence

	N	Minimum	Maximum	Average	Std. Deviation
Pretest KSE High	29	67	87	77.14	5,792
Posttest KSE High	29	71	94	79.79	6,472
Pretest KSE Low	20	56	67	62.40	2,909
Posttest KSE Low	20	61	69	65.50	2,115

DISCUSSION

The implementation of differentiated learning has an effect on the motivation to learn chemistry of class X students of SMA Negeri 2 Totikum Banggai Kepulauan. This statement is in line with research from Ramdhani, Sarifudin and Darmawan (2024), which states that differentiated learning can have a positive influence in increasing students' learning motivation in History subjects. Mila Handayani and Tatang Muhtar (2022) also stated that using differentiated learning has a good relationship, one of which is in terms of increasing learning motivation.

Implementing differentiated learning is one of the creative ways that can adjust the diversity of students that can increase motivation to learn chemistry. Based on the results of the study, it can be said that differentiated learning can be implemented in chemistry learning to activate students in following the learning process so that motivation to learn chemistry can also increase. Students become active in the learning process because they can access information in answering the tasks given according to their own wishes.

The chemistry learning outcomes in this study are aspects obtained by students which include three things, namely cognitive, affective and psychomotor after following a series of learning processes in chemistry subjects. The data on student learning outcomes were obtained after the periodic system of elements material was taught to both the experimental group and the control group.

The implementation of differentiated learning in the learning process can improve learning outcomes. However, differentiated learning in this study did not affect the chemistry learning outcomes of class X students of SMA Negeri 2 Totikum. Many factors cause this to happen. One factor that causes differentiated learning to have no effect on learning outcomes is because differentiation in this study is limited to process elements only. The process carried out is also not optimal because there are still students who use learning media that are not in accordance with their intended use. For example, the teaching materials used are not used optimally because students focus on using the internet to search for information in completing assignments. Differentiated learning should be able to improve learning outcomes. This statement is in accordance with research conducted by Laia (2022) at SMAN 1 Lahusa stating that differentiated learning strategies that are adjusted to the diversity of students' learning needs have succeeded in overcoming learning outcome problems (in Rachmadhani and Kamalia (2023).

Kamal (2021) and Kado (2021) found that differentiated learning strategies improve student learning outcomes and learning activities by differentiating tasks based on ability/cognitive levels. Another study by Bikic (2016), by combining PBL learning in differentiated learning strategies by differentiating the content to be learned based on three levels of complexity, also showed an increase in student learning outcomes. Research by Suwartiningsih (2021) and Fitra (2022) with differentiated learning strategies for process, content, and product at the junior high school level found that differentiated learning strategies in science lessons were able to improve student learning outcomes.

The explanation above illustrates that differentiated learning should be carried out based on process, content and product elements so that students become active and motivated in following the learning process. In addition to the application of differentiated learning, another factor that can influence learning motivation is social emotional competence. The results of this study indicate that students with high social emotional competence have greater motivation to learn chemistry compared to students with low social emotional competence. This statement is in accordance with that stated by Virginanti (2019) who stated that students' social emotional learning competence can be integrated into learning steps, because it can have a positive impact on student development, namely increasing the ability to empathize, build positive relationships, and increase student participation in learning. In addition, social emotional learning, according to Avandra (2023) helps students in increasing learning motivation by providing skills, can reduce stress and anxiety in the learning process (Fitri, 2024). Based on the hypothesis test, it also shows that social emotional competence influences the motivation to learn chemistry of class X students of SMA Negeri 2 Totikum Banggai Kepulauan.

Students with high socio-emotional competence have higher learning motivation, because they realize that learning is a necessity and there is hope to achieve their goals in the future. Social emotional competence can be improved through social emotional learning which contains several competencies that students must have. Students' social emotional learning competencies can be integrated into learning steps, because they can have a positive impact on student development, namely increasing the ability to empathize, build positive relationships, and increase student participation in learning (Virginanti, 2019).

The explanation above illustrates that social emotional competence is certainly able to improve students' chemistry learning outcomes when integrated into the learning process. This statement is reinforced by the statement by Damayanti and Nugrahanta (2023) which states that integrating social emotional competence into the learning model can also support the needs of the 21st century, so that it can help students solve problems and make the right decisions from the problems faced (in Fitri, 2024).

The results of this study also prove that students with high social emotional competence obtain higher learning outcomes compared to students with low social emotional competence. The results of the hypothesis indicate that there is an influence between social emotional competence on the chemistry learning outcomes of class X students of SMA Negeri 2 Totikum Banggai Kepulauan. Students who have high social emotional competence certainly have high learning motivation.

The explanation above shows that learning motivation is closely related to learning outcomes. Where students who have high learning motivation will certainly get high learning outcomes. This is in accordance with the results of research presented by Dimyati and Mudjiono (2013) stating that someone who has high motivation in learning, then the learning outcomes that person will get will be better. When having high learning motivation, students will actively participate in the learning process and be able to carry out learning activities with full confidence and responsibility compared to students with low learning motivation.

CONCLUSION

Based on the results of data analysis and discussion of research results, the following conclusions can be drawn:

1. The implementation of differentiated learning has an effect on the motivation to learn chemistry of class X students of SMA Negeri 2 Totikum Banggai Kepulauan.
2. The implementation of differentiated learning has no effect on the chemistry learning outcomes of class X students of SMA Negeri 2 Totikum Banggai Kepulauan.
3. Social emotional competence influences the motivation to learn chemistry of class X students of SMA Negeri 2 Totikum Banggai Kepulauan.
4. Social emotional competence influences the chemistry learning outcomes of class X students of SMA Negeri 2 Totikum Banggai Kepulauan.

RECOMMENDATION

1. Differentiated learning can be implemented in chemistry and other subjects because it can increase students' learning motivation and learning outcomes.
2. Social emotional competence needs to be improved so that learning motivation and learning outcomes increase by implementing social emotional learning.
3. The implementation of differentiated learning needs to pay attention to content, process and product elements.

For further researchers, this research can be used as a reference for further research, especially that related to differentiated learning and social emotional competence in increasing learning motivation.

FURTHER STUDY

This study has several limitations that can be considered for further research. One of them is the scope of the application of differentiated learning which is still limited to the process element, without optimally involving the content and product elements. In addition, the number of samples and the scope of the material used are still limited to one school and one chemistry learning topic. Therefore, further research is recommended to develop differentiated learning more comprehensively by involving all elements (content, process, and product), as well as integrating social emotional learning in instructional design. Further research also needs to expand the number and variety of subjects, and consider a mixed approach (quantitative and qualitative) to gain a deeper understanding of the influence of learning strategies on student motivation and learning outcomes in a broader context.

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