



# Teaching Methods and Learning Motivation for Population Knowledge and Environmental Concern

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## ABSTRAK

Masih rendahnya motivasi belajar dan pengetahuan siswa tentang kependudukan dan lingkungan berpengaruh terhadap kepedulian siswa terhadap lingkungan dan masalah kependudukan. Sehingga diperlukan solusi agar mampu meningkatkan sikap siswa yaitu melalui penggunaan metode belajar yang efektif. Tujuan penelitian ini adalah untuk menguji perbedaan pengetahuan kependudukan dan kepedulian lingkungan yang menggunakan metode mengajar diskusi dan metode mengajar ceramah kepada siswa mempunyai motivasi belajar tinggi dan mempunyai motivasi belajar rendah. Penelitian ini menggunakan kuasi eksperimen dengan desain faktorial 2x2. Subjek penelitian adalah kelompok siswa meliputi 80 siswa yang terdiri dari 40 siswa memiliki motivasi belajar tinggi, dan 40 siswa memiliki motivasi belajar rendah untuk kelas 12. Pengumpulan data mengenai pengetahuan kependudukan dan kepedulian lingkungan dilakukan dengan instrument tes objektif dengan pilihan jawaban Benar (B) dengan skor 1 dan Salah (S) dengan skor 0. Setelah data terkumpul selanjutnya dianalisis dengan analisis varians dua jalur, dan uji Tukey. Hasil penelitian mengungkap bahwa: ada perbedaan yang signifikan dari kedua metode mengajar, dimana metode mengajar diskusi lebih efektif daripada metode mengajar ceramah, metode mengajar ceramah lebih baik dipergunakan pada kelompok belajar dengan motivasi belajar tinggi, metode mengajar diskusi lebih baik dipergunakan pada kelompok belajar dengan motivasi belajar rendah, terdapat pengaruh interaksi antara metode mengajar dengan motivasi belajar terhadap pengetahuan kependudukan dan kepedulian lingkungan, dimana motivasi belajar yang tinggi, metode mengajar ceramah lebih baik dipergunakan daripada metode mengajar diskus, tetapi ada kecenderungan sebaliknya untuk motivasi belajar rendah.

## ABSTRACT

The low motivation to learn and students' knowledge about population and the environment affects students' concern for the environment and population problems. So, a solution is needed to improve students' attitudes, namely through effective learning methods. This study aimed to test the differences in population knowledge and environmental awareness using discussion teaching methods and lecture teaching methods to students with high learning motivation and those with low learning motivation. This study used a quasi-experimental design with a 2x2 factorial design. The study's subjects were a group of 80 students consisting of 40 students with high learning motivation and 40 with low learning motivation for grade 12. Data on population knowledge and environmental awareness was collected using an objective test instrument with the answer choices True (B) with a score of 1 and False (S) with a score of 0. After the data was collected, it was analyzed using two-way variance analysis and the Tukey test. The results of the study revealed that there are significant differences between the two teaching methods, where the discussion teaching method is more effective than the lecture teaching method, the lecture teaching method is better used in learning groups with high learning motivation, the discussion teaching method is better used in learning groups with low learning motivation, there is an interaction effect between teaching methods and learning motivation on population knowledge and environmental awareness, where high learning motivation, the lecture teaching method is better used than the discussion teaching method, but there is a reverse tendency for low learning motivation.

## 1. INTRODUCTION

Indonesia is one of the developing countries with a large population. The population of Indonesia when compared to the population of several countries in the world is ranked fourth after the People's Republic of China, India, and the United States. The population density and growth figures in Indonesia when compared to the population in the world still show higher figures (Sholihah et al., 2020; Widyawati

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et al., 2021). The average population density in the world is only 45 people/square kilometer while the population density in Indonesia is 106 people/square kilometer. This rapid population growth brings various complex challenges, both at the national and local levels (Fauzi et al., 2022; Purwadi et al., 2019). Nowadays, the rapid population growth and increasing human needs cause the environment to be sacrificed to meet human needs. In fact, there is a reciprocal relationship between humans and their environment (Finanda & Gunarto, 2021; Herlindawati et al., 2018). A very important factor in environmental problems is the size of the population (BA Ramadhan & Setyowati, 2023; Widyawati et al., 2021). Rapid population growth, the need for food, fuel, housing, and domestic waste are also increasing rapidly. This population growth has resulted in major changes in the environment, especially in developing countries where the economic and technological levels are still low (Febriani, 2022; Indrianawati & Mahdiyyah, 2019).

One of the visible impacts is the destruction of forests and water systems accompanied by the extinction of plants and animals, soil erosion, and poor sanitation (Nugroho et al., 2020; Sari et al., 2023). Humans can utilize existing natural resources but have an obligation to maintain the environment. Therefore, taking preventive and curative actions (repair) of environmental damage is the duty of humans as the cause of the damage and at the same time those who will be affected by the environmental damage itself. Population problems need attention from all of us, if not considered then it will hinder development in our country both now and in the future (Finanda & Gunarto, 2021; Mintiea & Pigawati, 2018). To ensure our survival and the survival of future generations, in a good and pleasant atmosphere and to ensure the continuity of various layers of life in nature. This change in attitude is not only because nature is so important to humans, but because nature with the various layers of life in it, provides values that must be respected and protected. The environment affects human life and vice versa humans are influenced by their environment. Thus the environment becomes an important part of human life to meet their needs (Febriani, 2022; Warni et al., 2022). Awareness of the importance of maintaining the environment, including the social environment, is to keep it clean. The social environment is formed because of social interaction in society. This social environment can form a certain built environment that is characterized by human behavior as a social creature (Dwi, Sekar Savitri & Rahardjo, 2017; Warni et al., 2022). The relationship between individuals and society is very close and influences each other and is interdependent. Maintaining and preserving the environment means ensuring its continuity for future generations, one of which is through education (Handayani et al., 2022; Masykuroh & Fajriah, 2023). In order for the environment to be sustainable, humans must have insight and knowledge of population and environmental concerns, so that they are aware and able to maintain the sustainability and function of the environment. Knowledge about the environment is expected to be given early on to students in all units, levels of education, both formal and informal (Naziyah et al., 2021; Purwanti et al., 2022).

High school as one of the first and main places in the formation of a person of faith and character, then from an early age student must be given adequate provisions about environmental awareness knowledge. As a form of participating in the success of the government program in implementing population and environmental education learning (PKLH). Therefore, in population and environmental learning, it needs to be designed in such a way that students can learn comfortably. One of them is by using varied teaching methods and learning motivation that can increase students' awareness of environmental and population problems (Aryo Kusuma Yaniaja et al., 2021; Yulianto & Putri, 2020). Effective teaching methods and strong learning motivation are key factors in instilling environmental and population care values in students.

The use of innovative and participatory teaching methods, such as group discussions, contextual lecture approaches, and project-based learning will be able to bring students closer to understanding environmental and population issues in depth. The discussion method is one of the student-centered learning strategies, in the discussion method students are actively involved in the learning process. In the context of building an attitude of environmental concern, this method has a significant influence because it creates a collaborative, critical, and reality-relevant learning atmosphere. Through this method, students not only gain theoretical knowledge, but are also trained to think critically, analyze problems, and find practical solutions. Teaching methods that are close to everyday life can also increase students' awareness of the importance of maintaining environmental balance and understanding population dynamics (Andesta, 2021; Sanjani, 2020). In addition to learning methods, teachers must be able to increase students' learning motivation, because learning motivation, both intrinsic and extrinsic, affects how much students are actively involved in learning. Students who have high learning motivation tend to be more enthusiastic in exploring environmental and population issues, and are more ready to implement the values they learn in everyday life (Prabawa & Restami, 2020; Sukarini & Manuaba, 2021). Strong learning motivation possessed by each student can also increase students' sense of responsibility towards environmental sustainability and community welfare. Learning motivation can be fostered by giving invitations in the form of lectures and joint discussions (Jayanti et al., 2020; Setyaningsih et al., 2020). Therefore, as a teacher, it is important

to be able to combine the right teaching method and high learning motivation, so that students not only understand the importance of caring for the environment and population, but are also able to demonstrate real attitudes and actions that support sustainable development.

Several previous studies have stated that teaching methods have an effect on increasing students' knowledge and learning outcomes (Nisa & Sujarwo, 2020; Yolantia et al., 2021). With teaching methods and continuous motivation, students' understanding of environmental issues can be improved. Discussion methods can improve students' learning activities. It is important for teachers to provide learning motivation for students, because by using strong learning methods and motivation, students' concern for the environment and the impact of population growth can be improved (Donna et al., 2021; Kamza et al., 2021a). Other research states that the lecture method has an impact on increasing students' knowledge and basic concepts (Rikawati & Sitingjak, 2020; Savira et al., 2018). Because with lectures the scope of material delivered by the teacher will be broader and structured. Based on these findings it can be said that the use of methods and the provision of learning motivation have a positive impact on the learning process. Therefore, this study aims to test the differences in population knowledge and environmental awareness using discussion teaching methods and lecture teaching methods to students who have high learning motivation and have low learning motivation.

## 2. METHODS

The study was conducted experimentally using a 2 X 2 factorial design. The dependent variables were population knowledge and environmental awareness, while the independent variables included teaching methods as treatment variables, and learning motivation as attribute variables. The factorial design of the study is presented in Table 1.

**Table 1.** The Research Design

Variables Attribute	Variables Treatment	Teaching Methods A	
		Discussion A1	Lecture A2
Motivation to learn B	Tall B1	A1B1	A2B1
	Low B2	A1B2	A2B2
	<b>Interaction:</b>	<b>AXB</b>	

Information:

A1B1 = group of students who received the discussion teaching method who had high learning motivation.

A2B1 = group of students who received the lecture teaching method who had high learning motivation.

A1B2 = group of students who received the discussion teaching method who had low learning motivation.

A2B2 = group of students who received the lecture teaching method who had low learning motivation.

This research was conducted at SMA Negeri 1 Tambun-Bekasi, West Java Province in the 2024 academic year. The subjects of the study were a group of 80 students consisting of 40 students with high learning motivation and 40 students with low learning motivation. Data collection on population knowledge and environmental awareness was carried out using an objective test instrument with the answer choices True (B) with a score of 1 and False (F) with a score of 0. The data were analyzed using two-way analysis of variance (two-way anova), after first meeting the requirements for normality and homogeneity between groups of research subjects, followed by the Tukey test to determine the occurrence of the interaction effect between the independent variables on the population and environmental awareness. Based on the Lilliefors test at the  $\alpha$  level of 0.05, it shows that overall the research subject group has a normal distribution. Likewise, the results of the homogeneity test at the  $\alpha$  level of 0.05 a value of 0.05 indicates that overall the research subject group has no different variance.

## 3. RESULT AND DISCUSSION

### Results

The research hypothesis was inferentially tested using analysis of variance (ANOVA). The research results are presented in Table 2.

**Table 2.** The Two-Way Analysis of Variance Summary

Source of Variance	Dk	JK	RJK	Fh	Ft	Ft
					$\alpha= 0.05$	$\alpha= 0.01$
Between Columns (A)	1	1.156	1.156	4.576*	2.73	4.13
Inter Line (B)	1	2.278	2.278	10.6114	2.73	4.13
In	1	17.376	17.376	63.754**	2.73	4.13
<b>Total</b>	<b>76</b>	<b>437</b>				

Information :

\* = significant ( $F_h = 4.576 > 2.73$ ) at  $\alpha = 0.05$

\*\* = very significant ( $F_h = 63.754 > 4.13$ ) at  $\alpha = 0.01$

Based on the results of the analysis of variance (ANOVA) at a significance level of  $\alpha = 0.05$ , the results of  $F_h = 4.576$  were obtained, which was greater than  $F_t = 2.73$ . This means that  $H_0$  is rejected. So it can be concluded that there is a significant difference in population knowledge and environmental awareness between students who are given the discussion teaching method and students who are given the lecture teaching method. There is an interaction between teaching methods and learning motivation on population knowledge and environmental awareness. Based on the results of the analysis of variance (ANOVA) at a significance level of  $\alpha = 0.05$ , the results obtained  $F_h = 63.754$  are greater than  $F_t = 4.13$ . This means that  $H_0$  is rejected. So it can be concluded that there is an interaction between teaching methods and learning motivation on population knowledge and environmental awareness. The results of data analysis using the Tukey test between students who were given the lecture teaching method and those who were given the discussion teaching method, for students who had high learning motivation gave a Qcount value = 6.4782 which was greater than the Qtable value ( $0.05; 4; 76$ ) = 3.68. This means that  $H_0$  is rejected. So it can be concluded that there is a difference in population knowledge and environmental awareness of students who were given the lecture teaching method and students who were given the discussion teaching method, for students who have high learning motivation. Judging from the average score, it can be concluded that the average score of population knowledge and environmental awareness given the discussion teaching method = 7.2368 is lower than the average score of population knowledge and environmental awareness given the lecture teaching method = 7.8431, for students who have high learning motivation. Thus, group (A1B1) < group (A2B1). The results of data analysis using the Tukey test between students who were given the discussion teaching method and those who were given the lecture teaching method, for students who had low learning motivation, gave a calculated Q value = 10.487 which was greater than the Q table value ( $0.05; 4; 76$ ) = 3.68. This means that  $H_0$  is rejected. So it can be concluded that there is a difference in population knowledge and environmental awareness of students who were given the discussion teaching method and students who were given the lecture teaching method, for students who have low learning motivation. Judging from the average score, it can be concluded that the average score of population knowledge and environmental awareness given the discussion teaching method = 8.2531 is higher than the average score of population knowledge and environmental awareness given the lecture teaching method = 7.2528, for students who have low learning motivation. Thus, group (A1B2) > group (A2B2).

## Discussion

From the results of the research analysis, several findings were shown. First, population knowledge and environmental awareness given the discussion teaching method were higher than population knowledge and environmental awareness given the lecture teaching method. This shows that there are differences in student learning outcomes in terms of knowledge of the learning methods used by teachers. The learning methods used by teachers in the learning process can affect learning outcomes, both in terms of knowledge and attitudes. In this case, the discussion and lecture methods have different characteristics that have an impact on students' population knowledge and environmental awareness. The discussion method is a student-centered method, meaning that it provides students with the opportunity to be actively involved in the learning process, which is certainly different from the lecture method which is still centered on the teacher (Donna et al., 2021; Rahmawati et al., 2022). In discussions, students are encouraged to think critically and creatively, because students are given the opportunity to explore their knowledge with their group members while lectures focus more on receiving information provided by the teacher. This result is in line with the results of previous studies which revealed that students who exchange information and review their experiences will allow their new knowledge and experiences, without considering learning motivation, then there is knowledge between the research subjects who are taught



discussions with the research subjects who are taught lectures, where students who are taught discussions are better applied by being taught lectures (Aguswandi, 2018; Kamza et al., 2021b).

The second finding, shows that the group of students who have high learning motivation, population knowledge and environmental awareness who are given the lecture teaching method are higher than population knowledge and environmental awareness who are given the discussion teaching method. Students who have high learning motivation, they tend to have advantages in utilizing informative learning methods, such as lectures, compared to discussion methods (Chaidir, 2021; Taufiq et al., 2021). In learning with the lecture method, the material is delivered in a structured, direct, and efficient manner, so that highly motivated students can absorb information quickly and organize it independently. With high learning motivation, students will be more focused and active in listening so that they are able to maximize learning outcomes even though the learning process is one-way (Rusmiati, 2022; Savira et al., 2018). Unlike the discussion method, students who already have strong learning motivation will be less than optimal because they depend on their group. Sometimes in 1 group there are those who are active and those who are less active, this will affect the productivity of the group, so students with strong learning motivation tend to prefer learning with the lecture method because they can focus and are more efficient in meeting their learning needs, because they do not require group interaction which sometimes hinders (Rikawati & Sitinjak, 2020; Savira et al., 2018).

The third research result shows that the group of students who have low learning motivation, population knowledge and environmental awareness are higher when learning with the discussion method than population knowledge and environmental awareness that are given the lecture teaching method. Students who are taught with the discussion method, and the teaching materials have been prepared more carefully to be discussed with those who have low learning motivation will be able to receive the teaching materials more effectively. Because the discussion method can involve students actively in the learning process (Suandi, 2022; Wulandini et al., 2021). In discussions, students are given the opportunity to participate in conversations, listen to different points of view, and express their opinions. So this method helps students with low motivation to feel more involved, because they are not just passive listeners, but part of the joint exploration process (Herawati, 2022; Suandi, 2022). The interaction of students in each group also creates a supportive environment, where students can learn from their friends and get additional motivation to understand the material. The opposite will not affect if students who have low motivation are taught using the lecture method because they will not focus on listening to what the teacher says and do not feel emotionally connected to the material presented. Therefore, the discussion method is more effective in improving understanding and building environmental awareness in students with low learning motivation. The results of this study are in line with previous studies which stated that population knowledge and environmental awareness of groups of students with low learning motivation showed high results if taught through discussion (Rahmawati et al., 2022; Suandi, 2022). Students' motivation to learn is low, they are less interested in the material being taught because they feel bored so that population knowledge and environmental awareness are less than optimal.

The fourth finding shows that there is an interaction between teaching methods and learning motivation towards population knowledge and environmental awareness. The interaction between teaching methods and learning motivation has a significant influence on students' population knowledge and environmental awareness. The method of delivering material by teachers is a factor that determines the success of teaching (Hidayat et al., 2022; Oktaviyanti et al., 2020). The use of effective teaching methods can maximize the potential of students with different levels of learning motivation. Students who have high learning motivation easily understand what is conveyed by the teacher when the teacher uses the lecture teaching method. Those who are highly motivated to learn are less interested when given the discussion teaching method, because they already have adequate initial knowledge and feel bored about it, they will be challenged by lecture activities, so that there is a positive effect on increasing population knowledge and environmental awareness. Lectures help them organize population knowledge, such as population growth, migration, and its impact on the environment, efficiently (Lestari et al., 2017; Savira et al., 2018). On the other hand, in groups of students who have low learning motivation, it is more effective if given a discussion teaching method because they pay more attention to the material being discussed so that their population knowledge and environmental awareness increase better.

This interaction shows that teaching methods cannot be applied universally without considering students' learning motivation. This means that as a teacher, we must be able to choose and use the right learning method according to students' learning needs (DA Ramadhan & Muhroji, 2022; Sururuddin & et al., 2021). Students who have high motivation can achieve good results, both knowledge and motivation with instructive learning methods, while students with low motivation need a more collaborative approach to build engagement and understanding. Several previous studies have stated that teaching methods have an effect on increasing students' knowledge and learning outcomes (Nisa & Sujarwo, 2020; Yolantia et al.,

2021). With teaching methods and continuous motivation, students' understanding of environmental issues can be improved. Discussion methods can improve students' learning activities. It is important for teachers to provide learning motivation for students, because by using strong learning methods and motivation, students' concern for the environment and the impact of population growth can be improved (Donna et al., 2021; Kamza et al., 2021a). Other research states that the lecture method has an impact on increasing students' knowledge and basic concepts (Rikawati & Sitingjak, 2020; Savira et al., 2018). Because with lectures the scope of material delivered by the teacher will be broader and structured. Based on previous findings, it can be concluded that the selection of learning methods and providing motivation in the learning process is very important and has an effect on student learning outcomes. The implications of this study are that in the future teachers are expected to optimize the use of effective and innovative learning methods according to the learning needs of students in order to improve learning outcomes both in terms of knowledge and student motivation.

#### 4. CONCLUSION

Based on the results of the study, it can be concluded that there are differences in population knowledge and environmental awareness in groups of students who are given discussion and lecture teaching methods. In groups of students with high learning motivation, they will have better population knowledge and environmental awareness when given the lecture teaching method compared to the discussion method. Conversely, in groups of students with low learning motivation, they will have better population knowledge and environmental awareness when given the discussion teaching method compared to the lecture method. So, it can be said that there is an interaction between teaching methods and learning motivation on population knowledge and environmental awareness that they have. It is proven that through teaching methods, population knowledge and environmental awareness can be improved in groups of students at SMA Negeri 1 Tambun-Bekasi, both those with high and low learning motivation.

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