

THE CORRELATION BETWEEN BIOLOGY TEACHER LEARNING STRATEGIES DURING THE COVID-19 PANDEMIC ON STUDENT MOTIVATION

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**THE CORRELATION BETWEEN BIOLOGY TEACHER LEARNING STRATEGIES
DURING THE COVID-19 PANDEMIC ON STUDENT MOTIVATION****Riszky Puja Kurniawan¹, Insar Damopolii^{2*}, Silvia H. Kusuma Sirait³**^{1,2,3}Jurusan Pendidikan Biologi, Universitas Papua, Indonesia*Corresponding author. Jurusan Pendidikan Biologi, Universitas Papua, Jl. Gunung Salju Amban, Manokwari
98314, IndonesiaEmail: i.damopoli@unipa.ac.id**Abstract**

There is a ban on face-to-face learning during the Covid-19 pandemic. This condition forces teachers to find adequate learning strategies so that their students are motivated to learn. The present research article aimed to reveal the correlation between biology teacher learning strategies during the Covid-19 pandemic on student motivation. The correlational method was used in this research. A total of 191 senior high school students were taken as a sample. An online questionnaire was an instrument for collecting data. Data analysis used simple regression. The research result was showed that $p < 0.05$ and $R = 0.610$. These findings indicate that there was a strong correlation between biology teacher learning strategies on student learning motivation. This research concluded that using appropriate strategies during the Covid-19 pandemic encourages students to be motivated to learn.

Keywords: : *biology teacher, covid-19 pandemic, learning strategy, motivation***INTRODUCTION**

Based on interviews with teachers in senior high, several things about online learning at the beginning of the pandemic were found. The strategy used in the learning process during the Coronavirus diseases 2019 (henceforth Covid-19) pandemic was online teaching. Teachers carry out teaching activities online through classroom applications such as WhatsApp, Edmodo, CloudX & Zoom. Teachers have been assisted and comfortable with applications, but they still lack because they have not been combined between one application and another.

Teachers have used the application to support the learning process during the Covid-19 pandemic, but there are still some obstacles. Students are not familiar with the online learning process. The government's social distancing policy with an unspecified time during the Covid-19 pandemic resulted in each meeting in online learning. There are still students who don't have a smartphone. The network's quality is unstable. The family economy is below average, so students cannot buy internet quotas. The delivery of the material has not been packaged attractively. These things cause students' learning motivation to decrease. Students appear to be passive, easily bored, and lack collaboration between students in the learning process, and students become less skilled. The students are challenging to remember and understand the concepts being studied, especially biology subjects.

A good and exciting teacher strategy is needed to motivate students to learn during the Covid-19 pandemic. The teacher's strategy has an essential meaning in the learning motivation of students. Learning strategies and learning opportunities provided by teachers help students develop (Darling-Hammond, Flook, Cook-Harvey, Barron, & Osher, 2020). Teaching teachers is positively correlated to encourage students to be motivated to learn (Guilloteaux & Dörnyei, 2008). Carefully designed learning strategies support learning motivation [1]. Students experience causes the brain to develop and be able to think (Cantor, Osher, Berg, Steyer, &

Rose, 2019; Nunaki, Damopolii, Nusantari, & Kandowangko, 2019). Problems that arise during learning make students need learning even though there are many obstacles. Teachers must respond to their students' learning needs when students' needs are responded to by the teacher by creating a practical experience and environment for them (Steele & Cohn-Vargas, 2013). A review by (Potvin & Hasni, 2014) reveals that motivation increases when teachers use variations in teaching. Motivation is essential for student learning achievement (Taylor et al., 2014).

A teacher in research (Daniels, 2017) said that his students are a digital generation, so teachers must keep up with technological developments. Teachers must be good at assessing situations and using this information to adapt teaching to student learning needs (Andersson & Palm, 2018). The Covid-19 pandemic situation is an ongoing problem. The teacher's strategy is to use technology to help him teach and communicate with his students. Good communication between teachers and students keeps students motivated (Urhafe, 2015). Different teaching makes students motivated and enthusiastic about learning (Hornstra, Stroet, van Eijden, Goudsblom, & Roskamp, 2018). Variations in learning levels support the needs of students in learning (Bieg, Backes, & Mittag, 2011; Hospel & Galand, 2016).

Students' experiences in schools and teachers can inhibit or encourage the motivation of learners (Grombczewski, 2011; Jalongo, 2007). Student motivation has a relationship with what the teacher does (Frenzel, Goetz, Pekrun, & Watt, 2010; Kim & Schallert, 2014; Wheelless, Witt, Maresh, Bryd, & Schrodt, 2011). Teaching teachers based on theory affects students' motivation (Turner, Christensen, Kackar-Cam, Trucano, & Fulmer, 2014) and student achievement results (I. Damopolii, Botutihe, & Nunaki, 2019). The problem that needs to be studied is how the teacher's strategy deals with the Covid-19 pandemic. The pandemic is still occurring. The teachers' teaching strategies must change according to the conditions that arise. Motivating students to learn needs to be done by the teacher. The present research article aimed to reveal the correlation between biology teacher learning strategies during the Covid-19 pandemic on student motivation.

METHOD

The present research used the correlational method. The correlation between teacher strategy (variable X) and motivation to learn biology (variable Y) was to reveal in this research (see figure 1). The research was conducted at a public high school in Manokwari. A total of 191 public high school students were respondents. They were given a questionnaire on teacher strategies and learning motivation.



Figure 1. Correlation between teacher strategy and motivation in biology learning

Two google form questionnaires were used in this research. The first is about teacher strategy. The variables measured were the teacher's ability to open lessons, the teacher's ability to assess or evaluate learning, the teacher's ability to conduct core learning activities, the teacher's ability to close the lesson, and the supporting factors. This questionnaire consists of 40 statements. Validation by three experts and tested on 25 students obtained 28 valid statements (12 invalid statement and deleted). The reliability test got 0.916, which means reliable (using the Cronbach alpha formula). The second questionnaire is student motivation in learning biology. The number of statements in the questionnaire was 45. The variables measured were a willingness and desire to succeed in learning, the passion and need for education, hopes and goals in the future, the

existence of rewards in the learning process, and an environment conducive to learning. Based on three expert validation results and tested on 25 students, 31 valid statements were obtained (14 statements were invalid and deleted). Cronbach alpha testing formula has been obtained 0.933 (reliable).

Five categories were used for teacher strategy and motivation data. (1) $0 \leq \text{score} < 40$ (poor). (2) $40 \leq \text{score} < 60$ (less). (3) $60 \leq \text{score} < 70$ (sufficient). (4) $70 \leq \text{score} < 80$ (good). (5) $80 \leq \text{score} \leq 100$ (excellent). Simple regression analysis was used with normal data requirements. Kolmogorov Smirnov was used for testing the data normality distribution.

RESULTS AND DISCUSSION

Uncovering the correlation between teacher strategy and learning motivation in biology learning was revealed in this research. Both teacher strategy and motivation are measured based on five aspects using a google form questionnaire. The categorization of teacher teaching strategies presents in Table 1. The categorization of students' learning motivation in biology learning offers in Table 2. The results of regression testing shown in Tables 3-5.

Table 1. Categories of teacher learning strategies

| No | The aspect of teacher learning strategy | Score | Category |
|----------------|--|--------------|------------------|
| 1 | The teacher's ability to open lessons | 86.35 | Excellent |
| 2 | The teacher's ability to conduct core activities | 81.97 | Excellent |
| 3 | The teacher's ability to assess or evaluate learning | 75.57 | Good |
| 4 | The teacher's ability to close the lesson | 86.56 | Excellent |
| 5 | Supporting factors | 87.32 | Excellent |
| Average | | 83.56 | Excellent |

Table 1 revealed that students' responses to teacher teaching strategies during the pandemic were excellent. The teacher's ability to open lessons, carry out core activities, close lessons received, and learn support factors were excellent. On the other hand, the teacher's ability to evaluate obtained good responses from students. The supporting factor aspects get the highest score because they affect teachers' ability to implement a learning strategy. The supporting factors aspect referred to, among others, is the teacher's ability to use language clearly and easily understood by students. The teacher has the right attitude, is polite and appreciates students, is fair without discriminating against students, dresses and dresses politely following applicable norms, and organizes time under the allocation provided. Teachers' vital role in learning is to make learning look fun and increase learners' interest in learning (Jungert, Levine, & Koestner, 2020).

Students will be more motivated to learn if they can explain and convey material or information clearly and easily understood. Effective teaching behavior makes a significant contribution to improving student performance (Hattie, 2012). The proper teacher strategy makes students successful (Insar Damopolii & Kurniadi, 2019). The learning process will take place well if the teacher teaches fun, such as being friendly, paying attention to all students, and helping students who have learning difficulties. The progress or lack of motivation in teaching is directly linked to classroom discipline. When teachers can find something interesting, this stimulates students' attention towards learning (Jungert et al., 2020).

Table 2. Student learning motivation

| No | The Aspects of learning motivation | Score | Category |
|----------------|--|--------------|------------------|
| 1 | There is a willingness and desire to succeed in learning. | 84.20 | Excellent |
| 2 | There are passion and need for learning | 83.25 | Excellent |
| 3 | Have hopes and goals for the future | 76.86 | Good |
| 4 | There is an award in the learning process | 79.09 | Good |
| 5 | There is an environment that is conducive to learning well | 79.51 | Good |
| Average | | 80.58 | Excellent |

The achievement of student learning motivation in Table 2 suggests that student learning motivation during the pandemic period was excellent. Having hopes and goals in the future, the existence of awards in the learning process, and a conducive environment to learning well achieved good categories. On the other hand, two aspects reach the excellent category. The two aspects are willingness and desire to succeed in education and the passion and need for learning.

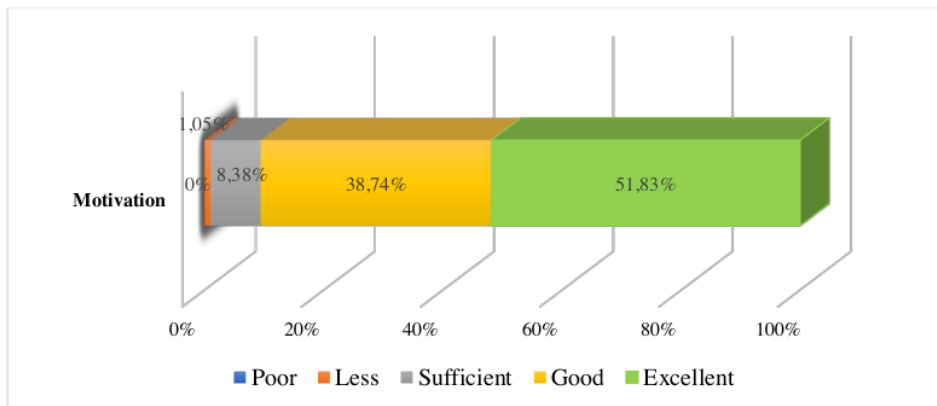


Figure 2. Percentage of students' motivation to learn biology during the Covid-19 pandemic

Figure 2 presents the percentage of students' motivation to learn biology during the Covid-19 pandemic. This graph proves that there are no students who have low motivation to learn biology. Very few students have less and sufficient motivation to learn. Students' learning motivation is dominant to excellent and excellent. This research has revealed that teaching strategies for students during the Covid-19 pandemic can motivate students to learn. Learner motivation is influenced by various teacher strategies (Zarei, Ahour, & Seifoori, 2020). The use of active learning helps improve student motivation (Bishara, 2018). This research shows that the right learning motivation by students follows a useful teaching strategy by teachers. The pandemic situation has not prevented teachers from teaching well. It appears that students in biology class are well motivated. As many as 90.58% of students are motivated by the right - excellent category.

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A relationship analysis was carried out to proving the relationship between teacher teaching strategies and student learning motivation. Before analysis, a prerequisite test was carried out. The prerequisite test is a data normality test. Testing the data obtained that the data were normally distributed (N = 191, SD = 8.799, P > 0.05). Parametric test results (simple regression) were shown in Tables 3-5.

Table 3. ANOVA summary

| Model | Mean Square | Df | Sum of Squares | F | P |
|------------|-------------|-----|----------------|---------|-------|
| Regression | 8705.381 | 1 | 8705.381 | 111.861 | 0.000 |
| Residual | 77.823 | 189 | 14708.588 | | |
| Total | | 190 | 23413.969 | | |

Table 3 reveals a correlation between teacher learning strategy to biology learning motivation ($P < 0.05$). The teacher learning strategy is a predictor for biology learning motivation.

Table 4. Coefficient of regression

| Model | Coefficients of Unstandardized | | t | P |
|---------------------------|--------------------------------|------------|--------|-------|
| | B | Std. Error | | |
| (Constant) | 30.301 | 6.606 | 4.587 | 0.000 |
| Teacher learning strategy | 0.746 | .071 | 10.576 | 0.000 |

Table 4 present $P < 0.05$. It reveals that the correlation between teacher learning strategy to biology learning motivation is acceptable. The regression model is $y = 40.301 + 0.746X$; it ensures that each increase in one score of teacher learning strategy increases students' biology learning motivation by 0.746.

Table 5. Regression summary

| Model | R ² | Adjusted R ² | R | Std. The error of the Estimate |
|-------|----------------|-------------------------|-------|--------------------------------|
| 1 | 0.368 | 0.372 | 0.610 | 8.82175 |

The R-value in Table 5 was 0.610. It showed that there was a strong correlation between teacher learning strategy on biology learning motivation. R² was 0.372, which reveals that the contribution of teacher learning strategy on biology learning motivation was 37.2%. Based on the findings, it is telling that teacher learning strategy correlates with biology learning motivation. The correlation strength between the teacher learning strategy and student motivation is a healthy category.

Our research findings prove that teacher learning strategies are closely related to student motivation to learn biology. Despite pandemic conditions, teachers have confirmed that they can provide proper learning for their students. Teacher learning strategies contribute to student motivation (Guilloteaux & Dörnyei, 2008). Our research has found that teachers' strategies for coping with the Covid-19 pandemic motivate their students to learn. The teacher combines various strategies from the beginning to the end of the lesson. The excellent response from students evidences this (see table 1). An excellent response indicates that the teacher provides the learning needs of students. The teacher provides learning conditions that suit the needs of students during a pandemic. Students remain motivated to learn even though there are restrictions on activities at school. An excellent response to the fifth aspect of learning motivation (see the fifth aspect of motivation in table 2) indicates the conditions for online classroom learning according to their needs. Likewise, the second aspect is the enthusiasm and need for learning has the highest score. It is because students have high enthusiasm for learning to achieve the results to be achieved. Students get satisfaction from the effects of their hard work and make learning a necessity. It means that students need to learn during a pandemic, and the teacher provides this through online learning. Teaching that supports the needs of students makes them motivated to be involved in education (Hornstra et al., 2018).

Teachers teach to succeed in their students. During a pandemic, teachers think about using the right strategy. Curriculum changes cause teachers to develop their skills and competencies in designing effective learning (Daniels, 2017). The use of technology, such as zoom applications, google classroom, etc., is a supporting tool for teaching. Our research found that students' responses to the teacher's ability to carry out core activities were very good. In the core activities excellent learning during the Covid-19 period, teachers used various applications. Applications used by teachers such as Edmodo, CloudX, and WhatsApp. A teacher in the study (Daniels, 2017) was motivated to use technology. He said that the use of technology boosts student motivation. Technologies such as mobile learning are encouraging students to learn (I. Damopolii & Kurniadi, 2019). It is clear in this research that student learning motivation is right.

Aspects of motivation regarding the desire and desire to succeed in learning have been responded to very well by students. Even 90.57% of them are well motivated to study biology, even during the Covid-19 pandemic. Student motivation has a relationship with what the teacher does (Keller, Goetz, Becker, Morger, & Hensley, 2014). In our research, the biology teacher learning strategy during the Covid-19 pandemic had a robust correlation strongly correlated Covid-19 pandemic is not over until the end of 2020. To address changes in learning policies, teachers must prepare the right strategy for teaching. The right strategy affects students' motivation to learn. Strong motivation in students causes students to succeed in fulfilling their wishes.

CONCLUSIONS

Student response to the teacher's teaching strategy is excellent. This excellent response was followed by their excellent motivation to learn. Based on these findings, it can be concluded that biology teachers' teaching strategies had a relationship with their students' learning motivation. During the pandemic, there has been a change in teacher teaching strategies. Initially, teachers and students found it difficult to learn online. When students' learning needs are met, it keeps them motivated. The teacher's teaching strategy has an impact on student learning motivation. It has a robust correlation. In the future, innovative teaching strategies are needed to keep students motivated to learn.

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REFERENCES

- Andersson, C., & Palm, T. (2018). Reasons for teachers' successful development of a formative assessment practice through professional development a motivation perspective. *Assessment in Education: Principles, Policy & Practice*, 25(6), 576–597.
- Bieg, S., Backes, S., & Mittag, W. (2011). The role of intrinsic motivation for teaching, teachers' care and autonomy support in students' self-determined motivation. *Journal for Educational Research Online*, 3(1), 122–140.
- Bishara, S. (2018). Active and traditional teaching, self-image, and motivation in learning math among pupils with learning disabilities. *Cogent Education*, 5(1), 1436123.
- Cantor, P., Osher, D., Berg, J., Steyer, L., & Rose, T. (2019). Malleability, plasticity, and individuality: How children learn and develop in context1. *Applied Developmental Science*, 23(4), 307–337.
- Damopolii, I., Botutihe, V. T., & Nunaki, J. H. (2019). The contribution of science process skill towards students cognitive achievement through guided inquiry-based learning. *Journal of Physics: Conference Series*, 1317, 012184. <https://doi.org/10.1088/1742-6596/1317/1/012184>
- Damopolii, I., & Kurniadi, B. (2019). Training students metacognitive skill using mobile learning. *Journal of Physics: Conference Series*, 1317(1), 012185. <https://doi.org/10.1088/1742-6596/1317/1/012185>
- Damopolii, Insar, & Kurniadi, B. (2019). The Development of Android-based Mobile Learning Supported by Problem-based Learning Strategy for Students' Learning Success. *Int. J. Sci. Technol. Res*, 8(7), 190–193.

- Daniels, E. (2017). Curricular factors in middle school teachers' motivation to become and remain effective. *RMLE Online*, 40(5), 1–14.
- Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B., & Osher, D. (2020). Implications for educational practice of the science of learning and development. *Applied Developmental Science*, 24(2), 97–140. <https://doi.org/10.1080/10888691.2018.1537791>
- Frenzel, A. C., Goetz, T., Pekrun, R., & Watt, H. M. G. (2010). Development of mathematics interest in adolescence: Influences of gender, family, and school context. *Journal of Research on Adolescence*, 20(2), 507–537.
- Grombaczewska, M. (2011). The relationship between teacher's feedback and students' motivation. *Humanising Language Teaching*, 3(3), 27–38.
- Guilloteaux, M. J., & Dörnyei, Z. (2008). Motivating language learners: A classroom-oriented investigation of the effects of motivational strategies on student motivation. *TESOL Quarterly*, 42(1), 55–77.
- Hattie, J. (2012). *Visible learning for teachers: Maximizing impact on learning*. Routledge.
- Hornstra, L., Stroet, K., van Eijden, E., Goudsblom, J., & Roskamp, C. (2018). Teacher expectation effects on need-supportive teaching, student motivation, and engagement: a self-determination perspective. *Educational Research and Evaluation*, 24(3–5), 324–345.
- Hospel, V., & Galand, B. (2016). Are both classroom autonomy support and structure equally important for students' engagement? A multilevel analysis. *Learning and Instruction*, 41, 1–10.
- Jalongo, M. R. (2007). Beyond benchmarks and scores: Reasserting the role of motivation and interest in children's academic achievement an ACEI position paper. *Childhood Education*, 83(6), 395–407.
- Jungert, T., Levine, S., & Koestner, R. (2020). Examining how parent and teacher enthusiasm influences motivation and achievement in STEM. *The Journal of Educational Research*, 113(4), 275–282.
- Keller, M. M., Goetz, T., Becker, E. S., Morger, V., & Hensley, L. (2014). Feeling and showing: A new conceptualization of dispositional teacher enthusiasm and its relation to students' interest. *Learning and Instruction*, 33, 29–38.
- Kim, T., & Schallert, D. L. (2014). Mediating effects of teacher enthusiasm and peer enthusiasm on students' interest in the college classroom. *Contemporary Educational Psychology*, 39(2), 134–144.
- Nunaki, J. H., Damopolii, I., Nusantari, E., & Kandowangko, N. Y. (2019). The contribution of metacognitive in the inquiry-based learning to students' thinking skill based on SOLO Taxonomy. *Journal of Physics: Conference Series*, 1321, 032044. <https://doi.org/10.1088/1742-6596/1321/3/032044>
- Potvin, P., & Hasni, A. (2014). Interest, motivation and attitude towards science and technology at K-12 levels: a systematic review of 12 years of educational research. *Studies in Science Education*, 50(1), 85–129. <https://doi.org/10.1080/03057267.2014.881626>
- Steele, D. M., & Cohn-Vargas, B. (2013). *Identity Safe Classrooms, Grades K-5: Places to Belong and Learn*. Corwin Press.
- Taylor, G., Jungert, T., Mageau, G. A., Schattke, K., Dedic, H., Rosenfield, S., & Koestner, R. (2014). A self-determination theory approach to predicting school achievement over time: The unique role of intrinsic motivation. *Contemporary Educational Psychology*, 39(4), 342–358.
- Turner, J. C., Christensen, A., Kackar-Cam, H. Z., Trucano, M., & Fulmer, S. M. (2014). Enhancing students' engagement: Report of a 3-year intervention with middle school teachers. *American Educational Research Journal*, 51(6), 1195–1226.
- Urhahne, D. (2015). Teacher behavior as a mediator of the relationship between teacher judgment and students' motivation and emotion. *Teaching and Teacher Education*, 45, 73–82.
- Wheless, V. E., Witt, P. L., Maresh, M., Bryand, M. C., & Schrodt, P. (2011). Instructor credibility as a mediator of instructor communication and students' intent to persist in college. *Communication Education*, 60(3), 314–339.
- Zarei, M., Ahour, T., & Seifoori, Z. (2020). Impacts of implicit, explicit, and emergent feedback strategies on EFL learners' motivation, attitude and perception. *Cogent Education*, 7(1), 1727130.

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