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## Predicting Students' Biological Learning Motivation Based on Instructional Leadership and Big-five Personality

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### Abstract

Most schools in the world focus merely on cognitive teaching and learning processes to enlighten students in cognitive achievement, however, one important aspect has been neglected so far, called non-cognitive aspects such as students' motivation. Therefore, this research was aimed at finding out the information whether students' motivation in learning biological subjects could be predicted by how students' perception of teachers' leadership styles (instructional leadership) and their personalities as well. That was why a non-causal survey has been conducted involving 165 senior high school students that were selected randomly as the sample. There were three instruments developed which measured students' motivation in learning biological subjects (reliability coefficient was 0.96), leadership (reliability was 0.97), and personality (reliability was 0.94). Data were analyzed by multiple regression and correlation.

The research results revealed that students' motivation could be predicted by both instructional leadership and personality significantly. Most of the sample perceived their teachers' leadership styles were transformational rather than transactional, which meant that students perceived that their teachers have been frequently motivating, inspiring, guided, and even good influence on them. Students' motivation was also contributed strongly by students' personalities; therefore, it could be concluded that in trying to strengthen students' motivation, especially in this case, learning biology, both leadership and personality could be taken into account, particularly if school management need to build policies containing the academic improvement based on focusing on non-cognitive aspects.

**Keywords:** Big-five Personality, Instructional Leadership, Reliability, non-cognitive.

### Introduction

Education plays a very important role in the development of a nation. Education is also a means to improve and develop quality human resources. The success of education in learning biology can be influenced by two factors, namely external and internal factors. External factors are factors that arise from outside the student's self, such as the

conditions of the learning environment, parents, family, and teachers. Internal factors are factors that arise from within students such as intelligence, attitudes, talents, interests, health, attention, and motivation (Ross, 2013). Motivation is said to be a strong encouragement from outside and within a person that influences his efforts to carry out an activity (Colquitt, 2019). This is because the higher the

motivation possessed by students, the more directed the behavior of these students in learning biology.

Students who have high learning motivation will have personalities that try to find out more deeply about the biology material being taught and are more enthusiastic about learning (Haydée De Loof, et.al., 2021). Motivation plays an important role in encouraging students to show their best performance. If student learning motivation increases, then persistence in learning increases and provides clear direction for students in carrying out biology learning. Student performance will increase, along with increasing student motivation in carrying out their duties (Serap Özbaş, 2019).

Learning motivation plays an important role in improving the quality of biology learning in schools so that students can achieve effective learning. This can be achieved when the teacher's leadership role is very strong in coordinating classes, management skills, and leadership behavior are qualified. Instructional leadership from a teacher is important in carrying out biology learning in the classroom. The teacher must be a source of learning and direction for students (Joellen Killion et.al., 2016). Teacher leadership with characteristics of always paying attention to development, monitors, and always providing feedback on biology learning in class (Day & Sammons, 2013). Instructional leadership from a teacher does not only focus on delivering subject matter in class but also directs, organizes, and motivates students to study diligently and achieve quality learning outcomes.

Instructional leadership and student motivation can be built properly if you get support in the form of the big five student personalities in learning so that all aspects can achieve their goals. Big five personality is one of the key elements of motivation, as well as an important indicator of motivation, apart from intensity, direction, and persistence (Putrawan, 2020). Personality is very closely related to character education and the learning process. The learning process cannot be separated from the personality of students, personality is broadly categorized as a big-five personality, namely, openness, conscientiousness, extraversion, agreeableness, and neuroticism (Azucar, Marengo & Settanni, 2018). Students who understand character education will have good learning motivation through their personalities in the learning process. A good understanding of the relationship between personality characteristics and motivation to study biology is important for developing more effective teaching strategies.

Motivation to learn is mentioned as a boost in a person who can trigger enthusiasm to be active in learning biology (Owens et.al., 2017). Motivation can encourage the personality of someone who is strong-willed to determine the goals to be achieved. Student learning motivation needs to be continuously improved so that it is in line with the goals and personality to be achieved. Therefore, the teacher's role is very important in optimizing the biology learning process, especially in increasing student motivation. One of the factors for obtaining optimal biology learning is the

instructional leadership factor of a teacher. The task carried out by the teacher implies that the teacher is the leader of the class that is his authority. Based on the background above, it is necessary to research the relationship between instructional leadership and the big five personalities with students' motivation to learn biology.

## Research Methodology

The objective of this research was aimed at finding out information regarding the relationship between instructional leadership (X1) and big-5 personality (X2) with students' motivation (Y). That was why a non-causal survey has been used and around 165 senior high school students in Jakarta have been selected randomly. Three instruments developed by applying scaling 5-4-3-2-1 have been all proven to be reliable and consistently measured instructional leadership (consists of 4 dimensions; idealized influence, inspirational motivation, intellectual stimulation, and individual consideration), big-5 personality (consists of conscientiousness, agreeableness, extroversion, emotional stability, and openness), and motivation (consists of intensity, direction, and persistence). Hypotheses were tested by t-test after verification conducted such as regression model and linearity, including normality, and finally its partial correlation (first-order correlations).

## Research Results

Based on the calculation, it was found that the regression model between instructional leadership (X1) with students' motivation (Y), was found as  $\hat{Y} = 112.38 + 0.18 X1$ . This regression model was also found highly significant and linear. Therefore, its partial correlation was also found was 0.328 meaning that around 10 % of instructional leadership variation contributed to students' motivation by controlling their personality. On the other hand, personality contributed higher around 24.6 % on students' motivation when leadership was controlled through its regression model of  $\hat{Y} = 71,745 + 0,330 X2$  which both regression models were highly significant and linear as well.

Another finding was found that there was a positive relationship between instructional leadership and the big five personalities all together with students' motivation. Its regression model found was  $\hat{Y} = 53.007 + 0.118 X1 + 0.292 X2$  which was highly significant and linear as well. Therefore, its multiple correlation coefficient was 0.536, and this meant that around 28.7% variation in students' motivation was determined by instructional leadership and big five personalities. Therefore, these findings can be used as a theoretical contribution to the integrative model initiated by Colquitt, et.al. (2019) which could be seen in the below figure.

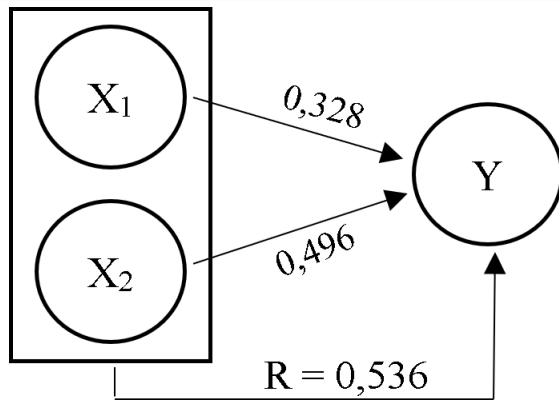


Figure: Empirical Constellation Model

## Discussion

The results of testing the first hypothesis show that there is a positive relationship between instructional leadership and students' learning motivation. The test results mean that the more positive the students' 'perception of teachers' leadership styles, the stronger the student's learning motivation would be. This is following several previous studies that have been conducted. Research in the journal educational management administration & leadership (2022) in elementary and secondary schools in Turkey. The results of this study indicate that instructional leadership can facilitate significant changes in learning effectiveness (Belibas, Polatcan & Kılinc, 2022).

Research by Noland & Richards (2014) shows a positive relationship between teacher leadership which has a positive impact on students' attitudes, motivation, and learning. Increased motivation is related to one's performance, where the role of leadership is very important in influencing

strong motivation, and trying to shape student thinking and character well (Gea & Putrawan, 2020).

The findings in the research of Berkovich & Hassan (2022) that there is important information to support motivational mechanisms wherein instructional leadership provides important strengths in learning. Instructional leadership plays an important role in student motivation in the classroom. This is an important finding because motivation is related to students' biology learning. Teacher leadership has a direct impact on students' learning motivation. Students expect teachers who can help them develop as individuals, taking the time to interact with students individually which can be done in various ways both inside and outside the classroom. Therefore it is important to know how the teacher manages the class, and how the teacher's leadership influences the class, especially learning motivation (Noland & Richards, 2014).

It was found also that there was a positive relationship between the big five personalities and the motivation to learn biology. The second hypothesis produces a positive coefficient value between the big five personalities and motivation to learn biology. This is to several previous studies that have been conducted (such as like carried out by Daniar, Putrawan, Guspri, 2021).

Research carried out by Fuentes, et.al. (2020) showed that there is a significant relationship between aspects of personality and learning motivation. Strengthened personality characteristics to produce optimal learning motivation (Fuentes, 2020). Kaspi-Baruch's research (2019) shows that there is a relationship between the big five personalities and creativity through moderation of learning-oriented motivational goal orientation. The relationship between the big five personalities (personality) and learning motivation is one of the important questions that must be answered in structuring the educational environment.

The characteristics of the big five personalities (personality) affect academic motivation and student achievement (Bozanoğlu & Sapançı, 2015). Personality is an organization of character and intelligence that is relatively stable and lasts a long time and determines the uniqueness of individual adaptation to the environment. Personality also has an individual's internal tendencies in behavior, which manifests itself in the integration of abilities, emotions, needs, motivations, interests, manners, and values. In the current study, personality traits are

defined as unique individual characteristics, needs, motivations, and other internal factors that are shown through language and behavior in the external environment.

Research on learning motivation can be traced to being defined as people's basic need to achieve as a drive to overcome obstacles, build strengths, and work hard on difficult tasks as much as possible. Based on the results of several previous studies that are relevant to the results of this study, there are differences. This difference can be seen from the results of previous findings which discussed the relationship of leadership or big five personalities with motivation to learn, while this study discussed instructional leadership and big five personalities with motivation to learn biology.

Even though there are differences, the overall results of the study conclude that leadership or the big five personalities has a relationship with learning motivation. The correlation between instructional leadership and big five personalities with motivation to learn biology provides novelty. In addition to leadership or the big five personalities having a relationship with learning motivation, the three variables are also positively correlated with each other. In testing, the third hypothesis concluded that there is a positive relationship between instructional leadership and the big five personalities together with the motivation to learn biology.

The results of this test show that the more positive the instructional leadership that exists and is supported by the big five

personalities, the stronger the students' motivation to learn biology. The motivation to learn biology will be better and stronger if the biology teacher has qualified instructional leadership and is supported by the big five personalities of good students. The results of this study are strengthened by previous studies. Postholm's research (2018) on the development of teacher professionalism in schools, illustrates that it is the teacher's learning process that needs to be developed if it is to lead to school improvement as a result (Postholm, 2018).

Research in the research journal *The Leadership Quarterly* (Elsevier) shows a potential relationship between personality and leadership behavior that can lead to success and good motivation (Deinert, et.al., 2015). Research Foo Seong et.al. (2015) presented a review of the literature on instructional leadership in Singapore and highlights the strategies leaders adopt. Teacher quality and leadership capacity are considered two important elements that contribute to the success of Singapore's learner-centered education system and place top priority on developing motivation to learn which is also influenced by the personality of students. These findings indicate that the three variables are interrelated to be able to make a positive contribution to the motivation to learn biology (Hasan, Putrawan, Astra, 2022).

## Conclusion

Based on the results of the study, several findings were obtained, namely: There is a positive and significant relationship between instructional leadership and the motivation

to learn biology. There is a positive and significant relationship between the big five personalities and the motivation to learn biology. There is a positive and significant relationship between instructional leadership and the big five personalities with students' motivation to learn biology. Considering those findings, it could be concluded that to make students' motivation to be stronger, therefore, both predictors, instructional leadership, and big five personalities need to be considered in developing such kind of policies that can be used as basic in improving school management in terms of biological teaching and learning process to be more effective.

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