How will personality combined with motivation affect student learning outcome of ecosystem course?

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Abstract. Learning outcome someone is determined by two factors, namely internal factors and external factors. Personality and motivation including internal factors that affect student learning outcome. This research aims to determine the correlation between personality and motivation with student learning outcome. Participants in this research are students of XI grade majoring in science from 13 Senior High School Jakarta. This research was held on August until September 2018 with 121 students of XI grade majoring in science chosen by simple random sampling. This research used the descriptive method with survey technique through correlative study. A correlation analysis revealed that personality and motivation were significant relationship with student learning outcome. Personality and motivation simultaneously provides a considerable contribution with student learning outcomes.

1. Introduction
Every student has different achievement on their learning. It’s happened because they’re a different individual with different personality and motivation in order to reach a good learning outcome. Some of them are learning enthusiast but other students are easily bored to do so, therefore their difference also befall on their motivation to get whether a good score or could care less on their score. There’s a lot of reason or factor that contributes to their learning achievement [1]. This research aims to determine the correlation between personality and motivation with student learning outcome in Biology learning.

According to various sources, Biology is a difficult subject and mostly delivered in a boring method [2,3]. A demand for deep comprehension to understand its concepts is one of reason as to why Biology is difficult subject [4,5]. Ecosystem chapter in Biology has a lot of concepts, hence students own their method to gain an understanding of its chapter based on their personality and motivation. This research tested a correlation between personality with student learning outcome that explained by Big Five Personality and motivation [6-8]. Some studies explained that personality could predict academic performance, academic motivation, and student’s achievement [9-11]. That being said, very few researches that focused on the personality of students and the difference of individual on three dimensions of motivation (direction, intensity, and persistence) with learning outcome.

Personality that measured in this research has five dimensions; neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness, therefore it’s well known as Big Five Personality which this theory is the most common uses among other theories. These five dimensions are owned by everyone, but another study stated that there is a personality trait which gives the biggest contribute to achievement on student learning outcome that is conscientiousness [12].
Motivation is what moves someone to act or do something. Each student has their own motivation to reach their learning outcomes. Motivation is formed by three dimensions; direction, intensity, and persistence [8]. Motivated student knows what they should do, focus on that activity, and willing to sacrifice their time to get their activity done. Those three dimensions of motivation were intriguing factors to observed in this research. Therefore, student’s motivation and personality are play a part in their learning outcomes.

2. Method
This research was a quantitative research with 121 students of SMAN 13 Jakarta as the samples, it was obtained by McClave equation. Those 121 students came from XI grade majoring in science chosen as sample by simple random sampling. This research used descriptive method with survey technique through correlative study.

The instrument for data collection was a study personality questionnaire which based on a Big Five Inventory (BFI) that was developed by John & Srivastava, motivation instrument that we used was developed by Colquitt, and multiple choice test for student learning outcomes measurement [7,13]. Personality instrument consisted of 40 items with 5-points scales from 1 = not very accurate to the item to 5 = very accurate to item and covered five dimensions of personality; agreeableness, openness to experience, conscientiousness, neuroticism, and extraversion (with 8 items for each dimensions). Agreeableness referred to a simple trusting person, warm, and friendly. Extraversion referred to an expressive person, energetic, and easy to socialize. Conscientiousness referred to a responsible person, self-discipline, well-regulated, and dependable. Openness referred to an innovated person, artistic, creative, and full of curiosity. Neuroticism referred to a depressed person, anxious, and easy to throw a rage. The Cronbach alpha technique was used and obtained a coefficient of 0.86, which followed by coefficient for agreeableness was 0.65, extraversion was 0.75, conscientiousness was 0.60, openness to experience was 0.64, and neuroticism was 0.68.

Motivation instrument consisted of 30 items with 5-points scales from 1 = not very agree to the item to 5 = very agree to the item. This instrument was measured three dimensions; direction, intensity, and persistence (with 10 items for each dimensions). The Cronbach alpha coefficient for this instrument was 0.82, which followed by coefficient for direction dimension was 0.77, intensity was 0.77, and persistence was 0.72.

3. Results

3.1. Correlation analysis
Pearson correlation coefficient analysis was used to determine the correlation between five domains of personality and motivation with student learning outcome. Student learning outcome instrument was multiple choice test of Ecosystem Chapter. The result from correlation analysis are presented in table 1.

| Variable                      | Learning Outcome |
|-------------------------------|------------------|
| Big Five Personality          | .346**           |
| Motivation                    | .301*            |
| Big Five Personality and Motivation | .355**         |

* : significant  
** : very significant

Table 1 revealed that there was a positive correlation and significant between big five personality and motivation with student learning outcome. The biggest coefficient score was the correlation between two independent variables which were personality and motivation with student learning outcome.
Multiple correlation score \( r = .355 \) that was bigger than others showed that when a sync work happened between personality and motivation simultaneously, together they could give a considerable contribute to learning outcome than when their work on each own. Student who has nurture their motivation also need a method for their own selves to stay motivated and responsible to acquire maximal learning outcome. Same goes with a student with their own personality as it would be better for them to develop a high motivation in order to reach their want, or in this case is a good learning outcome. Personality and motivation could strengthen each other to acquire a maximal learning outcome.

Another result that we found from a correlation between five dimensions of Big Five Personality and three dimensions of motivation with student learning outcome. The result of correlation analysis are presented in table 2

**Table 2.** Correlation between five dimensions of big five personality and three dimensions of motivation with student learning outcome.

| Variable                  | Learning Outcome |
|---------------------------|------------------|
| **Big Five Personality**  |                  |
| Agreeableness             | .184*            |
| Extraversion              | .235**           |
| Conscientiousness         | .223*            |
| Openness to experience    | .297**           |
| Neuroticism               | .201*            |
| **Motivation**            |                  |
| Direction                 | .130ns           |
| Intensity                 | .015 ns          |
| Persistence               | .266**           |

* : significant  
** : very significant  
ns : insignificant

Table 2 showed that five dimensions of personality has a positive correlation and significant with student learning outcome of Ecosystem Chapter. Openness to experience and extraversion were dimensions with biggest correlation coefficient among others yet for motivation variable, only persistence dimension which had a positive correlation with learning outcome.

3.2. Regression analysis

Regression analysis useful to identify personality dimension which had a strongest correlation with learning outcome. As for motivation, only persistence dimension which included on regression equation since it was the only one which had a positive correlation with learning outcome. On the other hand, learning outcome was a dependent variable. The result for regression analysis is presented in table 3.

**Table 3.** The result of Multiple Regression on Learning Outcome through Five Dimensions of Personality, Persistence, and Personality with Motivation

| Variable        | Beta   | \( R^2 \) | Adjusted \( R^2 \) |
|-----------------|--------|-----------|--------------------|
| **Step 1**      |        |           |                    |
| Agreeableness   | .134*  | .120      | .105               |
| Extraversion    | .089*  |           |                    |
Based on Table 3. Regression model obtained $R^2$ score was .120 and it showed that 12% from learning outcome variances was explained by five domains of personality. Meanwhile, regression model 2 with $R^2$ score was .071 showed that 7.1% from learning outcome variances was explained by persistence. Regression model 3 was yielded highest score for $R^2$, .126 that showed 12.6% from learning outcome variances was explained by Big Five Personality with motivation.

3.3. Discussion
Based on the result of this research, there was a positive and significant correlation between Big Five Personality and motivation with student learning outcome. That was showed in correlation coefficient score between them which was bigger than Big Five Personality and motivation. Furthermore, $R^2$ score was bigger than Big Five Personality and motivation. Every personality of their could increase their learning outcome if it’s supported by a strong motivation. Likewise with motivated student who also need support in form of hard work, enthusiasm, confidence, and unswerving in order to increase their learning outcome. The dimensions of Big Five Personality indeed has characteristic such as hard work, enthusiasm, confidence, and unswerving, which owned by every student. They may have different tendency to which the personality dimension dominating them but it still would contribute to gain a maximal learning outcome. It’s proved in a positive correlation between every dimensions with student learning outcome and also student motivation. Even though their motivation less directed to their goal as in direction dimension of motivation, less tenacious on their motivation as in intensity dimension of motivation, their motivation still has a high persistence as in persistence dimension of motivation. It’s enough to give a considerate contribution to learning outcome. Therefore, Big Five Personality and motivation simultaneously could affect or even increasing their learning outcome. Based on the result of regression analysis, three models of regression could use to predict learning outcome which has interaction with Big Five Personality and persistence of motivation.

Since the findings on this research showed that only persistence dimension of motivation variable which had a positive correlation in their coefficient score, we could say that it’s better to enhance student’s persistence as they more tend to have that persistence dimension out of other dimensions. To be more precise, their persistence could be shown in student’s routine such as have additional time to prepare for their test, take a note in every important concept from teacher, and recheck their test before teacher collects it, which those routine itself are a characteristic from persistence dimension. Student with higher persistence than other dimensions identified by their limitless time to work on something, reach their goal on time, and have an urge to reach perfection in their goal. This finding correspond with prior researches which obtained the result that persistence positively correlate with academic achievement and became a strong predictor to reach academic achievement [14,15]. Persistence dimension of motivation is measured by an amount of time of someone to reach what they want [16].
Another finding stated that the higher educational level, the higher persistence [17]. Those are explained why persistence dimension has a correlation positive and significant with learning outcome. Based on the explanation, it can be inferred that student of XI grade of SMA 13 Jakarta already sensitive to make time for reach what they want.

Five dimensions of personality positively correlate and significant with learning outcome, hence different personality dimension in every student still essential for increasing their learning outcome. In this research, it revealed openness to experience dimension has a higher correlation coefficient score than other dimensions. This result is in line with the finding that stated student with high openness to experience, extraversion, and conscientiousness could identify in their high academic goal [18]. Openness to experience and conscientiousness also showed positively correlate and significant with academic achievement that measured by Grade Point Average (GPA) [19]. Academic orientation in general is to obtain a maximal learning outcome. Student with a high openness to experience could increase their learning outcome because they would have self-confidence and glad to learn new concept from teacher. It would be easy for them to understand those concepts and enjoying their learning time. Another research stated that openness to experience is essential to get higher IQ [20]. The higher IQ the higher their curiosity to have a deep understanding and it follows with their higher learning outcome since they won’t have a hard time to answer the test. Therefore, in order to increase student learning outcome it would best for them to increase their openness to experience dimension. That being said, it doesn’t change the fact that five dimensions of personality have a positive correlation and significant with learning outcome to contribute 12% on student learning outcome.

4. Conclusion
The result of this research showed that five dimensions of personality had positive correlation and significant with student learning outcome. Even though the correlation score that we obtained was relatively small, it’s still play a role in contribution to learning outcome.

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