The Influence of Logical-Mathematical Intelligence and Personality Type on Student Learning Outcomes

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Abstract. This study aims to determine the effects of identity sorting and logical-mathematical insights on the learning outcomes of Universitas PGRI Madiun understudies. This investigation's approach makes use of quantitative approaches. The participants in this study were students enrolled in the Universitas PGRI Madiun Informatics Designing Thinking Programme, with a test sample consisting of the same number of students. One tool that could be used is a survey or questionnaire using a Likert scale. A distinct straight relapse study with a t-test, F-test, and coefficient of determination was used as the data examination method in this investigation. According to the investigation's findings, (1) logical-mathematical insights have a significant and favorable influence on the learning outcomes of Universitas PGRI Madiun students; (2) Identity kind has a notable and beneficial effect on the academic performance of Universitas PGRI Madiun students; (3) Understudies at Universitas PGRI Madiun benefit critically and favorably from logical-mathematical insights and identity sorting at the same time.

Keywords: Logical-Mathematical Intelligence, Personality Type, Learning outcomes

1   Introduction

Mathematics learning is a process where the interaction of various learning components develops students' thinking abilities in solving problems. Learning mathematics can help students to build mathematical concepts through their own abilities. Learning aims to generate student initiative and participation in learning [1]. It is not a surprise that many people view mathematics as a very boring and scary subject so students do not like mathematics lessons [2]. Two factors cause mathematics to be a difficult subject for students, namely internal factors and external factors, the first internal factor is a factor that arises from within the student, and the second external factor is a factor that arises from outside the student [3]. Mathematical logical intelligence is one of the internal influencing variables. Combining logical thinking with numeracy skills allows pupils to solve issues logically, which is known as mathematical logical intelligence.

Pupils with high mathematical logical intelligence typically possess the ability to comprehend a problem, evaluate it, and come up with a suitable solution.[4]. Students who have high logical-mathematical intelligence can usually understand a problem analyze it, and can solve it correctly. Logical-mathematical intelligence is a combination of numeracy and logical abilities[5]. Mathematical logic intelligence is intelligence that includes the ability to add together mathematically, think logically, be able to think deductively and inductively as well as sharpness in making logical patterns and relationships. This intelligence is closely related to science and logic. Some of these abilities are needed in learning and solving mathematics problems. So, in mathematics learning, the relationship between mathematical logic intelligence and students' mathematics learning outcomes is very close[6]

Not only logical mathematical intelligence, there are other internal factors of students that influence learning outcomes, namely student personality. Personality is a person's character which is related to intuition, thinking and attitudes. The grouping of extrovert and introvert personality types is based on differences in responses, habits and behavior displayed by a person. This grouping describes the interaction and communication patterns of each individual. A person with an extrovert personality type has the characteristics of being adaptable, happy, active, capable and optimistic. The extrovert personality type is an individual who can orient himself to the environment around him, is warm, friendly, likes parties, is relaxed. In general, individuals with this type like to make friends and have lots of friends, and like change, while the introvert personality type is an individual who always directs his gaze towards others. himself, his behavior is determined by what happens within himself, for him the outside world is not meaningful in determining his behavior, therefore it is not uncommon for individuals with this type to have no relationship with the environment around them [7]. The extrovert personality type is often characterized by distinctive characteristics, namely being responsive to the surrounding environment, also being creative in his relationships with other people, and being more reactive to the outside world around him in his efforts to fight. This personality type is more likely to be characterized by outward direction. An extrovert is someone who enjoys traveling a lot and is outgoing, but who finds it hard to rein in his impulsive and violent tendencies. The extrovert personality type is a type of personality dimension that is characterized by a tendency to be sociable, consistent, and pleasant [8]

Meanwhile, someone with an introverted personality has the characteristics of tending to be quiet, passive, not easy to get along with, pessimistic, calm, and controlled [9]. An introvert has a good understanding of the personal world which is related to all individual fantasies, dreams and perceptions, so that when they see an event in their social environment, they focus more on themselves and tend to be slower in responding because of their individuality [10]. In contrast to previous studies, this research will focus on findings regarding the influence of mathematical logical intelligence and personality type on student learning outcomes.

2   Method

This research was conducted to determine the influence of logical-mathematical intelligence and personality type on the learning outcomes of Informatics Engineering Study Program students at Universitas PGRI Madiun. Research methods used in quantitative research[11]. The population in this research were students from the Informatics Engineering Study Program at Universitas PGRI Madiun, with a test of 62 understudies.

utilized could be a survey or survey with a Likert scale, where the most elevated scale begins with the number 5 and the most reduced scale begins with the number 1. To measure the level of validity and reliability of the instrument, SPSS is used. The information examination strategy utilized in this inquire about is multiple linear regression analysis with t-test, F-test, and coefficient of determination

3   Result Discussion

This research uses quantitative research, which consists of the variables Logical-Mathematical Intelligence (X1), Personality Type (X2), and Learning Outcomes (Y). Questionnaires or questionnaires with a Likert scale are used in data collection strategies. Multiple linear regression analysis was the data analysis method employed, and SPSS version 23 was used. Out of the individuals who received the questionnaire, sixty-two completed it. Based on the results of the validity test, of the 35 questions consisting of 16 questions regarding the logical-mathematical intelligence variable (X1), 13 questions regarding the Personality Type variable (X2) and 6 questions regarding the Learning Outcomes variable (Y) in the questionnaire or questionnaire are all valid and reliable to be used as a data collection tool in this research.

Table 1. Result of Multiple Regression Analysis

Dependent variable	B	Q	Sig
Constant	2,255	1,877	0.067
Logical Mathematical Intelligence (X_1)	0.339	7,532	0,000
Personality Type (X_2)	0.131	2,773	0.003
F_{count}	100,321		
F_{Sig}	0,000		
R_{Square}	0.687		

From table 1, the following regression equation can be created:
Y = 2.255 + 0.339X 1 + 0.131 The Learning Outcome (Y) value is 2.255.

Table 2. Results of t test analysis

Model	Q	Sig
Constant	1,877	0.067
Mathematical Logical Intelligence (X_1)	7,532	0,000

From table 2, it is known that the Sig value. for Mathematical Logical Intelligence (X1) on Learning Outcomes (Y) of 0.000 < 0.05 and the calculated t value is 7.773 > t table 1.885, so it can be concluded that H 1 is accepted which means there is an influence between Logical Mathematical Intelligence (X1) on Learning Outcomes (Y). Mathematical logical intelligence is a student's ability to solve a problem by using the ability to think logically. In the learning process activities in class, many numeracy activities are used to provide feedback to students. This is to find out how much students have mastered the mathematical logical intelligence of the subject matter provided by the teacher[12]. Students with high mathematical-logical intelligence will be able to compare information, process numbers, see patterns or relationships in a problem and use inductive or deductive thinking to solve mathematical problems so that mathematical-logical intelligence has a positive and significant influence on students' mathematical communication abilities [14]

From table 3, it is known that the sig value. for the influence of personality type (X2) on Learning Outcomes (Y) of 0.005 < 0.05 and the calculated t value is 3.556 > t table 1.885, so it can be concluded that H 2 is accepted which means there is an influence between personality type (X2) on the Results Study (Y). In line with research   there is a significant influence of personality type on self-disclosure. Extraversion and neuroticism have a significant influence on self-disclosure in adults. It can be said that personality type is a factor that can influence a person's appearance, especially when communicating using social media [15].

Personality is a collection or syndrome of observable traits that are supertraits that exert a strong influence on behavior. These dimensions are composed of various components in the form of properties, which are a more specific reflection of the underlying dimensions. Based on these characteristics, the tendency to act is carried out by individuals that can be observed. Therefore, personality type has a positive and significant influence [16].

Table 3. Testing Hypothesis H2 with t test

Model	Q	Sig
Constant	1,877	0.067
Personality Type (X_2)	2,773	0.003

Table 4. Testing Hypothesis H3 with simultaneous test (F Test)

Model	F	Sig
Regression	100,321	0,000

From table 4, it is known that the Sig value. for the influence of Logical Mathematical Intelligence (X1) and Personality Type (This means that there is an influence between Logical Mathematical Intelligence (X1) and personality type (X2) simultaneously on Learning Outcomes (Y).

Table 5. Coefficient of Determination

Model	Rsquare
Regression	0.687

From Table 5, the coefficient of determination is useful for showing how much the independent variable contributes to the dependent variable. From the processed results, the R Square value is 0.687, which means that the influence of the Logical-Mathematical Intelligence (X1) and Personality Type (X2) variables simultaneously on the Learning Outcome variable (Y) is 68.7 % .

4   Conclusion

The following conclusions can be drawn from a study done on Universitas PGRI Madiun informatics engineering students: 1. Logical-mathematical intelligence significantly and favorably affects the learning outcomes of Universitas PGRI Madiun informatics engineering students. 2. The learning outcomes of Universitas PGRI Madiun students studying informatics engineering are significantly and favorably impacted by personality type. 3. Students studying informatics engineering at Universitas PGRI Madiun experience notable and favorable improvements in their learning results when they possess logical-mathematical intelligence and a particular personality type.

5   References

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