

THE INFLUENCE OF LEARNING MOTIVATION AND INTELLECTUAL INTELLIGENCE ON LEARNING ACHIEVEMENT IN ISLAMIC RELIGIOUS EDUCATION

Desti Widiani

UIN Raden Mas Said Surakarta
Jl. Pandawa, Pucangan, Kartasura, Sukoharjo, Central Java, Indonesia
Email: destiwidi@yahoo.com

Lilik Istiqomah

School of Humanities and Communication Arts
Western Sydney, Australia
Kingswood NSW 2747, Australia
Email: 20037462@student.westernsydney.edu.au

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ABSTRACT

This study examines the influence of learning motivation and intellectual intelligence on students' learning achievement in PAI (Pendidikan Agama Islam/Islamic Religious Education). This study applies a quantitative approach using a survey technique. The population of this study was students of class eight MTs (Madrasah Tsanawiyah/Islamic Junior High School) Muhammadiyah Gemolong and the sample was determined randomly. The data were analyzed using descriptive statistical methods, validity tests, reliability tests and multiple regression analysis. The results show a significant effect of intellectual intelligence, and learning motivation on student' learning achievement in PAI with $F_{count} 10.013 > F_{table} 0.000$; significance value 2 and 2.66 with $\alpha = 0.05$ and 0.01.

Keywords: Motivation, Intellectual Intelligence, Learning Achievement

ABSTRAK

Tujuan penelitian ini menganalisis pengaruh motivasi belajar dan kecerdasan intelektual peserta didik terhadap prestasi belajar Pendidikan Agama Islam (PAI). Penelitian ini menggunakan pendekatan kuantitatif dengan metode survey pada peserta didik kelas VIII MTs Muhammadiyah Gemolong, Sragen, Jawa Tengah yang ditentukan secara acak. Data penelitian dianalisis dengan metode statistik deskriptif, uji validitas, uji realibilitas, dan analisis regresi ganda. Hasil penelitian menunjukkan terdapat pengaruh signifikan kecerdasan intelektual dan motivasi belajar secara bersama-sama terhadap prestasi belajar peserta didik dalam mata pelajaran PAI dengan nilai $F_{hitung} 10,013 > F_{tabel} 0,000$; nilai signifikansi 2 dan 2,66 pada $\alpha = 0,05$ dan 0,01.

Kata Kunci: Kecerdasan Intelektual, Motivasi, Prestasi Belajar

INTRODUCTION

Learning achievement is the main benchmark to determine students' success during the learning process. In general, all students expect their learning achievement will fall into the good or satisfactory category. When it comes to their real learning circumstances, their expectations to achieve in learning are not always met. They could not achieve well to attain their academic achievement especially in the subject of Islamic education. It is widely accepted that student achievement is influenced by many factors beyond the teaching process (Dewi, 2021). In other words, students' learning achievement is strongly influenced by many factors. Their achievement in learning is not solely dependent on teaching and learning activities but various factors may come into play to influence.

Learning can be influenced by several factors like intelligence. Intelligence factor affects students' achievement in learning a particular subject like Islamic education. This factor is influential because it comprises a person's thinking capacity which then determines a person's way of thinking. It seems very convincing the notion that each individual has different intelligence ability. There are differences for individuals when it comes to speed and the degree of perfection in solving problems. In a nutshell, intelligence that exists in each individual is different among persons (Fairuz, 2020).

Intellectual intelligence is the most important psychological factor when it comes to students' learning process. It determines the quality of student learning. There might be a simple formula for this. The higher the level of intelligence of an individual, the greater the chance that individual will be successful in learning (Salichah, 2021). Conversely, the lower the individual's intelligence level, the more difficult it is for the individual to achieve learning success. Thus, intellectual intelligence greatly affects every student in achieving their learning achievement at school (Taslidere, 2020). In short, intellectual intelligence plays important role to influence students learning achievement.

Learning achievement is also shaped by individuals' motivation. In this case, motivation has played a crucial role in determining students' achievement in learning a particular subject. Motivation to learn is a psychological condition that encourages a person to want to learn. It can be in the form of desire to become a class champion. Other types of motivation can be in form of getting a scholarship, making their parents happy and so on. Learning motivation is a characteristic that can affect effective aspects of the students (Hwang et al. 2020).

Students who have learning motivation will pay more attention and try to remember what the teacher has taught them. They do these things because they know that those things help them to achieve their goals. High learning motivation will affect their learning achievement; therefore, students will work on practice questions on the subject matter that has been given by the teacher (Putra, 2021). On the other hand, a student who lacks or does not have self-motivation is unlikely to perform well (Saputro, 2019). This is to say that low learning motivation cause students to perform low and spend less energy to optimize their effort in learning.

Teachers are expected to boost students' motivation in learning. Students' motivation has a very important function to determine the intensity of students' learning effort. Their high motivation to learn leads them to perform and learn better than students who have low motivation (Mansir & Karim, 2020). In this stage, teachers should be able to motivate a student. Teachers move them to learn or want to learn something in a particular subject. At the initial stage, teachers should make students feel there is a need and they want to do some learning activities. There are several forms to boost students' motivation in learning activities at school. Giving points, awarding prizes, holding competitions, administering tests, giving praise, providing punishment, motivating students to learn, and focusing on preferred goals are the examples of forms to boost students' motivation (Muhith, 2021). Many of these things are done by teachers to generate student learning motivation to get the maximum achievement (Makmun, 2004).

Students' intellectual intelligence and learning motivation are two factors that influence their learning achievement (Langer, 2001). However, in reality, other factors play roles to support student learning achievement. Those factors include support from parents, teachers as mentors in the learning process, infrastructure facilities and the environment. Students interact with their teacher and parents and they may receive positive result from their interaction for their learning achievement. Learning process can be a powerful factor that contributes to students' achievement. In addition, facilities and learning environment may assist students and facilitate them to perform better to achieve learning outcomes.

This study conducted a preliminary study. It administered interviews with teachers of PAI for class eight at MTs Muhammadiyah Gemolong. The findings show that the level of PAI learning achievement of students is not proportional to the ability of intellectual intelligence and student motivation. There are some phenomena that often occurs. Some students with high intelligence levels lack their learning achievement. Other students with moderate or even low intelligence levels can outperform students with high intelligence levels (Saepullah, 2019). This can be seen in the daily test scores and report cards as well as student activities during the learning process. The level of student learning motivation is also still quite low. There are some evidences for this. The students are less disciplined in doing the homework given by the teacher. They do not pay attention to the teacher's explanation during the learning process. They do not take notes when there is a lesson and they prefer to chat with their classmates (Hery, personal communication, March 17, 2020).

Several studies have investigated students' intelligence and their learning achievement (Salichah, 2021; Taslidere, 2020). Other studies investigated motivation and learning achievement (Hwang et al., 2020). However, there is a scarce literature on the studies investigating both students' intelligence and motivation influence on students learning achievement. This study tries to fill this gap. The present study was aimed at investigating the influence of intellectual intelligence and learning motivation on learning achievement in PAI subjects for class eight MTs Muhammadiyah students in the 2019/2020 school year.

METHOD

This research is quantitative since the data is taken in the form of numbers (Sugiyono, 2012). It applies correlation and regression analysis techniques to look for the relationship and influence between two independent variables with one dependent variable. This method provides an overview of the variables found in the study as well as investigates the relationship and influence between the variables. This method uses factual data based on the information found (Iwamoto et al., 2016). The participants in this study were students of class eight from MTs Muhammadiyah Gemolong, Sragen, Central Java. A total of 100 students (24.69%) were selected from 405 students. A random sample was chosen for this study. The survey was administered to collect the data in this study (Crawford et al., 2020).

This study had three variables – two independent and one dependent. The former refers to intellectual intelligence (X1) and learning motivation (X2). The latter refers to students' learning achievement in PAI subjects (Y). The relationship between the variables can be described in the form of a problem constellation as shown in Figure 1.

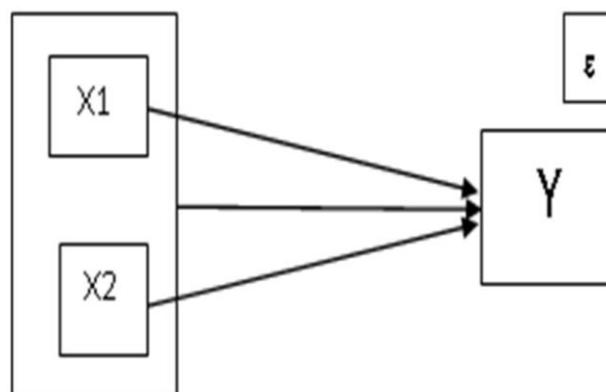


Figure 1. Relationship between Research Variables

Description:

- Independent Variable (X1) : Intellectual Intelligence
- Independent Variable (X2) : Learning Motivation
- Bound Variable (Y) : Learning Achievement
- ε : Other variables not studied

To obtain data on the students' material mastery and their achievement in learning PAI, the study involved other subjects like *Quran-Hadith*, *Aqidab-Akblaq*, *Fiqh* and History of Islamic Culture. The researchers used a written test in the form of multiple-choice, with the test items based on indicators from each subject in the 8th-grade odd semester, including (1) *Quran-Hadith* 25 questions, (2) *Aqidab-Akblaq* 25 questions, (3) *Fiqh* 25 questions, and (4) History of Islamic Culture 25 questions. In total, 100 items were tested.

Before the student achievement evaluation tool in this study was used, the instrument was tested. The test questions were given to the 8th-grade of MTs Muhammadiyah Gemolong, with a total of 40 students/respondents. The test results were then analyzed to determine the validity, reliability, level of difficulty, and differentiating power of the questions.

Item Validity

To determine the validity of each item, biserial point correlation statistics were used (Sugiyono, 2012) with the formula:

$$r_{pbis} = \frac{Mp - Mt}{St} \sqrt{\frac{p}{q}}$$

The calculation results r_{pbis} were then compared with r_{table} . If $r_{pbis} > r_{table}$ the item is valid and vice versa – if $r_{pbis} < r_{table}$ the item is invalid.

Question Reliability

In this study, the reliability test technique used is the KR-20 formula:

$$r_{11} = \left(\frac{n}{n-1} \right) \left\{ \frac{M(n-M)}{n \cdot St^2} \right\}$$

The obtained value of r was compared with the r_{table} product moment with a significant level of 5 %, if the $r_{11} > r_{table}$ product moment tested was reliable (Sugiyono, 2012).

Based on the results of the items on the test instrument, then calculated using the KR-20 formula, an r_{11} of 0.96 was obtained, which is higher than r_{table} 0.31 ($r_{11} > r_{table} = 0.96 > 0.31$) with very high criteria.

Level of Problem Difficulty

In addition to being tested for the questions' discriminating power, in calculating the test trials, the items' level of difficulty was also calculated.

Testing the Learning Motivation Questionnaire Instrument

The learning motivation questionnaire, before being distributed to students, was first tested, which was intended to determine whether the instrument met the level of validity and reliability of each item that had been prepared.

a. Item Validity

The formula used in finding the validity of the motivational questionnaire items was the product-moment correlation formula:

$$r_{xy} = \frac{N \sum XY - (\sum X)(\sum Y)}{\sqrt{\{N \sum X^2 - (\sum X)^2\} \{N \sum Y^2 - (\sum Y)^2\}}}$$

b. Item Reliability

Several techniques can be used to test the level of instrument reliability, including stability test, equivalence test, and internal consistency test. All these techniques produce reliability coefficients, which indicate the proportion of total variance in test scores that are score variance.

To calculate internal consistency with the coefficient alpha formula (α), the reliable level of motivational questionnaire items was used. The equation of the formula:

$$r_{11} = \frac{k}{k-1} \left(1 - \frac{\sum s_i^2}{s_t^2}\right)$$

Hypothesis Testing

The hypothesis in this study has the form of a relationship between variables. To prove relationship existence, the researchers applied a correlation coefficient test technique among the variables.

Descriptive statistical and correlation analysis techniques were applied to the analyzed data. Descriptive analysis is aimed to help systematically, factually, and accurately describe the facts obtained from the object under study.

A simple regression equation was used to test the associative hypothesis/relationship between learning motivation variables (X1) or intellectual intelligence (X2) and learning achievement. Multiple regression was used to test the associative hypothesis between the learning motivation variable (X1) and intellectual intelligence variable (X2) together with the learning achievement variable (hypothesis number 3).

RESULTS AND DISCUSSION

This study was aimed at investigating students' intelligence and motivation influence on their learning achievement. To achieve the objective of this study, tests, questionnaires, and documentation were used. Furthermore, the collected data were analyzed using regression analysis techniques – simple and multiple regression (DuBois et al., 2015). Three hypotheses are proposed in this study. First hypothesis states that there is a relationship between learning motivation and PAI learning achievement. Second hypothesis states that there is a relationship between intellectual intelligence and PAI learning achievement. The third hypothesis states that there is a relationship between learning motivation and intellectual intelligence together (simultaneously) with learning achievement.

Finding out students' PAI learning achievement can be through a test that was developed based on the indicators of each PAI subject at Madrasah Tsanawiyah. The indicators used by the researchers in determining student PAI learning achievement are on a scale of 0–100. From these calculations, students can be declared to have very good achievements if they can achieve an accumulative score of <90, are declared good achievers if they can achieve a cumulative score of 80-89, achieve quite well if they achieve a cumulative score 70-79, are considered to have achieved enough if they reach a cumulative score of 60-69 and is considered to have less achievement if they only achieve a score of >59. The PAI test questions are displayed in Table 1.

Table 1. PAI Test Instrument Grid

Basic competencies	Indicator	Number	Total
<i>(Quran Hadith)</i>			
1. Understand the history of the revelation of the Quran	1. Explain the meaning of the Quran.	1, 2	2
	2. Explain the time/period in which the Quran was revealed.	3, 4	2
	3. Explain how the Quran was sent down	5, 6	2
	4. Explain the names of the Quran	7, 8	2

Basic competencies	Indicator	Number	Total
2. Understand the meaning of <i>Hadith</i> and its kinds	1. Explain the meaning of <i>Hadith</i>	9, 10	2
	2. Explain the various <i>Hadith</i>	11, 12	2
	3. Distinguish <i>Hadith</i> and its kinds	13, 14	2
3. Understand the verses of the Quran about unity and brotherhood	1. Explain the verses of the Quran and <i>Hadith</i> about unity and brotherhood.	15, 16	2
	2. Demonstrate an attitude of unity and brotherhood	17, 18	2
4. Understand the <i>Hadith</i> about believing in the truth of Islam and <i>Istiqamah</i>	1. Explain the <i>Hadith</i> about the truth of Islam and <i>Istiqamah</i> .	19, 20	2
	2. Demonstrate an attitude of believing in the truth of Islam and <i>Istiqomah</i>	21	1
5. Apply the science of <i>tajweed</i> in reading the Quran.	1. Explain the law of reading <i>mim sukun</i> encountering <i>ra</i> , and <i>lam</i> .	22, 23	2
	2. Distinguish the law of reading <i>mim sukun</i> , encountering <i>ra</i> , and <i>lam</i> .	24	1
	3. Demonstrate the law of reading <i>mim sukun</i> , encountering <i>ra</i> , and <i>lam</i> .	25	1
<i>(Aqidah Akhlaq)</i>		26, 27	2
1. Increase faith in the books of Allah SWT.	1. Explain the meaning of believing in the books of Allah	28, 29	2
	2. Shows the names of Allah's books which were revealed to His Messengers	30, 31	2
	3. Showing an attitude of loving the Quran as the book of Allah		
2. Increase faith in Allah's Apostles.	1. Explain the meaning of believing in Allah's prophet	32, 33	2
	2. Shows the names of the prophets that must be known	34, 35	2
	3. Explain the obligatory qualities for Allah's prophets	36, 37	2
	4. Follow the obligatory qualities of Allah's prophets	38, 39	2
3. Understand miracles and other extraordinary events.	1. Explain the meaning of miracles and other extraordinary events (<i>karamah</i> , <i>maunah</i> , and <i>irhash</i>).	40, 41	2
	2. Show examples of miracles given to His prophets	42, 43	2
	3. Show the similarities and differences of <i>karamah</i> , <i>maunah</i> , and <i>irhash</i>	44, 45	2
4. Understand the behavior of the life of the prophet Muhammad SAW.	1. Explain the story of the prophet Muhammad SAW	46, 47	2
	2. Demonstrate the main characteristics of the prophet Muhammad SAW that should be imitated	48, 49, 50	3
<i>(Fiqh)</i>			
1. Understand the procedures for prostration of gratitude and recitations	1. Explain the provisions of prostration of gratitude and recitations	51	1
	2. Memorize the reading of the prostration of gratitude and recitations	52, 53	2
	3. Demonstrating prostration of gratitude and recitations	54, 55	2

Basic competencies	Indicator	Number	Total
2. Get used to <i>zikir</i> and pray after prayer	1. Explain the provisions of remembrance and prayer	56, 57	2
	2. Memorize the recitation of remembrance and prayer after prayer	58, 59	2
	3. Practice prayer and <i>zikir</i> after prayer	60, 61	2
3. Understand the procedure for fasting	1. Explain the provisions of fasting	62, 63	2
	2. Explain the types of fasting	64, 65	2
	3. Practice Ramadan fasting, vows, and sunnah	66, 67	2
4. Understand the procedures for <i>zakat fitrah</i>	1. Explain the provisions of <i>zakat fitrah</i>	68, 69	2
	2. Explain the consequences for people who do not issue <i>zakat fitrah</i>	70	1
	3. Practice <i>zakat fitrah</i>	71	1
5. Get used to donating assets outside of <i>zakat</i>	1. Explain the various ways of spending wealth outside of <i>zakat</i>	72, 73	2
	2. Explain the provisions of <i>ṣadaqah</i> , grants, and gifts.	74, 75	2
	3. Demonstrate <i>ṣadaqah</i> , grants, and gifts	-	-
(Sejarah Kebudayaan Islam/ Islamic Cultural History)			
1. Understand the progress of the Umayyad dynasty in the field of the Islamic religion	1. Identify the progress of the Umayyad dynasty in the field of Islamic religious knowledge along with its major figures and works	76, 77, 78	3
	2. Explain the impact of the progress of religious knowledge on the development of Muslims	79, 80, 81	3
	3. Follow the perseverance of figures in the field of the Islamic religion	82, 83	2
2. Understand the fall of the Umayyad dynasty	1. Identify the causes of the collapse of the Umayyad dynasty	84, 85	2
	2. Explain the process of the fall of the Umayyad dynasty	86, 87	2
	3. Take lesson/ <i>ibrah</i> from the collapse of the Umayyad dynasty	88, 89	2
3. Understand the history of the formation of the Ab- assiyah dynasty	1. Explain the background of the formation of the Abbasid dynasty	90, 91	2
	2. Explain the process of the formation of the Abbasid dynasty	92, 93	2
4. Understand the biography and policies of the caliph Abu Ja'far al Mansur	1. Explain the biography of the caliph Abu Ja'far al Mansur	94, 95	2
	2. Identify efforts and Abu Ja'far al Mansur's services	96, 97	2
	3. Follow the love of science caliph Abu Ja'far al Mansur	98, 99, 100	3
Total		100	100

The total number of questions is 100, which obtained r_{table} of 0.31 with db-2 (significance level 0.05%). A summary of the results of calculations with the validity of these items is provided in Table 2.

Table 2. Validity of Test Item for PAI Learning Achievement

No.	Criteria	Question Number	Total
1	Valid	01, 03, 04, 05, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 19, 22, 23, 24, 25, 27, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 46, 47, 48, 49, 50, 51, 52, 54, 55, 57, 59, 60, 61, 62, 63, 64, 66, 67, 68, 69, 71, 72, 76, 77, 78, 80, 81, 82, 84, 85, 86, 87, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 100	81
2	Invalid	02, 06, 18, 20, 21, 26, 28, 45, 53, 56, 58, 65, 70, 73, 74, 75, 79, 83, 99,	19
Total			100

The calculation of the level of difficulty for the trial test is provided in Table 3.

Table 3. Difficulty Level of PAI Test Items

No.	Difficulty Level	Number of questions	Criteria	Percentage
1	$0.00 < IK \leq 0.30$	-	Hard	0
2	$0.30 < IK \leq 0.70$	85	Medium	85
3	$0.70 < IK \leq 1.00$	15	Easy	15
Total		100	-	100

Based on Table 3, the difficulty level of the PAI learning achievement test trials is the items that meet the medium category, totaling 85 items, while 15 items are in the easy category.

A summary of the results of calculating the validity of the learning motivation questionnaire items from the pilot test in class eight A, with the number of participants/respondents 40, on DB-2 (significance level 0.05%) is summarized in Table 4.

Table 4. Summary of the Validity of the Questionnaire Items for Students' PAI Learning Motivation

Question Number	Correlation coefficient (r count)	$r_{table}(db-2)$ Significance 0.05 %	Description	Question Number	Correlation coefficient (r count)	$r_{table}(db-2)$ Significance 0.05 %	Description
1	0.41	0.31	Valid	19	0.40	0.31	Valid
2	0.58	0.31	Valid	20	0.38	0.31	Valid
3	0.52	0.31	Valid	21	0.34	0.31	Valid
4	0.35	0.31	Valid	22	0.42	0.31	Valid
5	0.56	0.31	Valid	23	0.08	0.31	T.valid
6	0.43	0.31	Valid	24	0.44	0.31	Valid
7	0.43	0.31	Valid	25	0.41	0.31	Valid
8	0.36	0.31	Valid	26	0.31	0.31	Valid
9	0.32	0.31	Valid	27	0.33	0.31	Valid
10	0.52	0.31	Valid	28	0.40	0.31	Valid
11	0.43	0.31	Valid	29	0.41	0.31	Valid
12	0.39	0.31	Valid	30	0.34	0.31	Valid
13	0.36	0.31	Valid	31	0.52	0.31	Valid
14	0.58	0.31	Valid	32	0.35	0.31	Valid
15	0.37	0.31	Valid	33	0.44	0.31	Valid
16	0.52	0.31	Valid	34	0.45	0.31	Valid
17	0.46	0.31	Valid	35	0.58	0.31	Valid
18	0.52	0.31	Valid				

Based on Table 4, there are 35 motivational questionnaire items – 34 valid items ($r_{count} > r_{table}$), and 1 invalid item ($r_{count} < r_{table}$). So, the questionnaire instrument that can be given to respondents is 34 items, according to the validity requirements.

The level of reliability for the calculation test results of the distribution of motivation questionnaires is 0.858. Based on the value of the reliable level, it can be said the PAI learning motivation questionnaire instrument has a very high level of reliability. Therefore, the

questionnaire items can be used as an instrument for collecting data on student learning motivation.

After tabulating the research data, this study analyzed and obtained the highest score (maximum score), lowest score (minimum score), average score (mean), and standard deviation (standard deviation). Those data are shown in Table 5.

Table 5. Recapitulation of Research Data

Variable	Max. Score	Min. Score	Mean	St. Deviation
X_1	89	43	59.69	10.44
X_2	120	88	99.86	8.67
Y	72	27	56.32	10.47

The data from the frequency distribution list with the number of six and the length of class eight, as shown in Table 6.

Table 6. Frequency Distribution of Student Learning Motivation Questionnaire Scores (X_1)

Number	Absolute Frequency	Relative Frequency (%)
43-51	6	6
52-60	18	18
61-69	15	15
70-78	39	39
79-87	21	21
88-94	1	1
Total	100	100

The data on intellectual intelligence (IQ) results of class eight students in MTs Muhammadiyah Gemolong, as shown in Table 7.

Table 7. Data on Intellectual Intelligence (IQ) Results of Class Eight Students in MTs Muhammadiyah Gemolong

No	IQ	Total (f)	Classification	Percentage
1	$67 \leq$	-	Backward	-
2	68-79	-	Border	-
3	80-90	3	Less than average	3
4	91-110	82	Average	82
5	111-119	14	Above average	14
6	120-127	1	Superior	1
7	$128 \geq$	-	Very superior	-
Total		100		100

Hypothesis test no. 1: There is a relationship between learning motivation and student achievement in PAI.

To test the hypothesis, a simple regression analysis calculation ($Y' = a + bX$) was applied. According to the calculation of simple regression analysis, it is found the value of $a = 36.21$ and the price of $b = 0.29$. The regression equation was used to predict PAI learning achievement based on the relationship with students' learning motivation $Y' = 36.21 + 0.29 X_1$.

Regression equations can be used to predict how high the value of the dependent variable will be when the value of the independent variable is manipulated (changed). This means every increase of 1 unit of learning motivation unit (X_1) will be followed by a linear increase in the score/value of the student's PAI learning achievement (Y) of 0.29, at a constant number of 36.21. In other words, the higher the motivation to learn, the higher the student's PAI learning achievement and vice versa, the lower the learning motivation, the lower the PAI learning achievement of students.

To determine the contribution of the influence of learning motivation on achievement analysis of determination (R^2) is used, the results of which can be seen by the following formula.

$$R_{y1}^2 = \frac{(\sum x_1 y)^2}{\sum x_1^2 \sum y^2} = \frac{9716437.09}{117027441.67} = 0.083 = 8.3\%$$

Based on the results of the calculation of the determination formula, the effective contribution of the learning motivation variable (X1) to the PAI learning achievement (Y) obtained a value of = 0.083 This means 8.3% of the PAI learning achievement (Y) is influenced by learning motivation (X1). This means the variation of students' PAI learning achievement (Y) is determined by the variety of learning motivation (X1) of 8.3%, through the regression equation $Y = 36.21 + 0.29 X1$. The remaining 91.70% is influenced/determined by other factors.

Meanwhile, to test the significance of the regression used $F_{\text{test}} (F_{\text{count}})$, with the formula:

$$F_h = \frac{RK_{reg}}{RK_{res}} = \frac{900.99}{101.54} = 8.87$$

Based on the calculation of the F_h formula, the F value obtained is 8.87. This value is then compared with the $F_{\text{table}} (F_t)$, with DK in the numerator = k and DK in the denominator = (n-k-1), and the error rate is set at 5%. In the table, F_t is equal to 0.001. In this case, the provision is "if F_h is greater than F_t , then the correlation coefficient tested is significant, that is, it can be applied to the entire population."

From the above calculation, it turns out the calculated F is greater than the F_{table} , namely $F_h > F_t$ ($8.87 > 0.001$), so it can be stated the simple regression is significant and can be applied where the sample is taken. The ANOVA table for the simple regression between learning motivation (X1) and PAI learning achievement (Y) is provided in the Table 8.

Table 8. Analysis of Variable of Learning Motivation (X1) with Learning Achievement (Y) for PAI Students

Source	JK	DK	RK	F	p	Conclusion
Regresi	900.989	1	900.989	8.873	0.004	Significant
Residu	9950.771	98	101.538			
Total	10851.760	99	109.614			

Based on the Table 8, the correlation coefficient of the student's learning motivation variable (X1) with the student's PAI learning achievement variable (Y) is 0.29, with $p = 0.004$, which means there is a significant correlation between learning motivation and students' PAI learning achievement. This shows the alternative (H_a), which says there is a relationship between PAI learning motivation and students' PAI learning achievement is accepted, and the null hypothesis (H_0), which states there is no relationship between PAI learning motivation and PAI learning achievement is rejected.

From the ANOVA table, the magnitude of F regression is from $F_{\text{count}} = 8.873$, $F_{\text{table}} = 0.004$. Then $F_h > F_t$ can be obtained, which indicates the regression direction coefficient of PAI learning achievement (Y) on learning motivation (X1) is significant and linear. Likewise, it can be said, by controlling for learning motivation (X1), there is still a positive contribution to PAI learning achievement (Y) or partial correlation.

Hypothesis Test No. 2: There is a relationship between intellectual intelligence (IQ) and students' PAI learning achievement

The calculation results have shown the value of $a = 14.16$ and the value of $b = 0.42$. The regression equation was used to predict PAI learning achievement based on students' learning motivation is $Y' = 14.16 + 0.42 X2$.

This means, every one unit increase in the student's intellectual intelligence unit (X2) will be followed by a linear increase in the student's PAI learning achievement score (Y) of 0.42, at a constant number of 14.16. In other words, the higher the level of intellectual intelligence of students, the higher the achievement of students' PAI learning. Vice versa, the lower the intellectual intelligence of students, the lower their PAI learning achievement. Graphically, the equation can be shown as $Y' = 14.16 + 0.42X_2$.

Based on the results of the calculation of the determination formula, the effective contribution of the intellectual intelligence variable (X2) to PAI learning achievement (Y) is obtained by the value = 0.122. This means 12.2% of PAI learning achievement (Y) is influenced by intellectual intelligence (X2). It means the variation of students' PAI learning achievement (Y) can be explained by the intellectual intelligence (X2) of 12.2%.

Based on the results of the calculation of the determination formula, the effective contribution of the intellectual intelligence variable (X2) to PAI learning achievement (Y) is obtained by the value = 0.122. This means 12.2% of PAI's learning achievement (Y) is influenced by learning motivation (X1). It means the variation of students' PAI learning achievement (Y) is determined by the variety of learning motivation (X1) of 12.2%, through the regression equation $Y = 14.16 + 0.42 X_2$. The remaining 81.8% is influenced/determined by other factors.

Based on the calculation of the F_{count} formula, the F value 13.66 is obtained. This value is then consulted with the F_{table} (F_t), where dk in the numerator = k and dk in the denominator = (n-k-1), and the error rate is set at 5%. In the table, F_t is equal to 0.000. In this case, the provision "if F_h is greater than F_t , then the correlation coefficient tested is significant, that is, it can be applied to the entire population."

From the above calculation, it turns out that F_{count} is greater than F_{table} , namely $F_h > F_t$ ($13.66 > 0.000$), so it can be stated the simple regression is significant and can be applied where the sample is taken. The ANOVA table for the simple regression between students' intellectual intelligence (X2) and PAI learning achievement (Y) in the Table 9.

Table 9. Analysis of Intellectual Intelligence Variable with Students' PAI Learning Achievements

Source	JK	DK	RK	F	P	Conclusion
Regressi	1237.565	1	1327.565	13.660	0.000	Significant
Residu	9524.195	98	97.186			
Total	10851.760	99	109.614			

From the ANOVA table, it can be said the magnitude of the F regression is $F_{\text{count}} = 13,660$, $F_{\text{table}} = 0.000$, Then it can be obtained $F_h > F_t$ which indicates the regression direction coefficient of PAI learning achievement (Y) on intellectual intelligence (X2) is significant and linear. Likewise, it can be said, by controlling students' intellectual intelligence (X2), there is still a positive contribution to PAI learning achievement (Y) or partial correlation relationship.

This shows the alternative (H_a), which says there is a relationship between intellectual intelligence and PAI learning achievement is accepted, and the null hypothesis (H_o), which states there is no relationship between intellectual intelligence and PAI learning achievement is rejected.

Hypothesis Test No. 3: There is a relationship between learning motivation and intellectual intelligence (IQ) together with students' PAI learning achievement

To test this hypothesis, the analysis used is multiple regression analysis with the formula $Y' = a + b_1X_1 + b_2X_2$.

Based on the calculation, it is found the price of $a = 4.00$, the price of $b_1 = 0.23$ and the price of $b_2 = 0.27$. So, the regression equation is $Y' = 4.00 + 0.23 X_1 + 0.27 X_2$. This means,

for every one unit increase in students' learning motivation (X1) and students' intellectual intelligence (X2), there will be an increase in students' PAI learning achievement (Y) of 0.23 on the variable of student learning motivation and 0.27 on the variable of intellectual intelligence (X2) at a constant number of 4.00. In other words, in this study it was proven the higher the student's learning motivation and intellectual intelligence together, the higher their PAI learning achievement.

To find out the contribution of the influence of learning motivation and intellectual intelligence together on students' PAI learning achievement, determination analysis (R^2) is used, the results of which can be seen by the following formula.

$$R_{y.12}^2 = \frac{JK_{reg}}{JK_{tot}} = \left[\frac{1857.077}{10851.760} \right] = 0.171 = 17.1\%$$

There is positive correlation between learning motivation and intellectual intelligence together with PAI students' learning achievement of 0.16. Based on the calculation of the F_h formula, the F price 10.013 is obtained. This price is then compared with the F_{table} (F_t), where DK in the numerator = k and DK in the denominator = $(n-k-1)$, and the error rate is set at 5%. In the table, F_t is equal to 0.000. In this case, the provision "if F_h is greater than F_t , then the multiple correlation coefficient tested is significant, that is, it can be applied to the entire population."

Based on the F_h calculation, it turns out the calculated F is greater than the F_{table} , namely $F_h > F_t$ ($10.013 > 0.000$), it can be stated the multiple correlations are significant and can be applied where the sample is taken. The ANOVA table for multiple regression between learning motivation (X1) and intellectual intelligence (X2) together on PAI learning achievement (Y) is the Table 10.

Table 10. Analysis of Variable of Learning Motivation and Intellectual Intelligence with Students' PAI Learning Achievements

Source	JK	DK	RK	F	P	Conclusion
Regresi	1857.869	2	928.539	10.013	0.000	Significant
Galat/Res	8994.683	97	92.729			
Total	10851.760	99	109.614			

Based on the results of multiple regression analysis as mentioned in the Table 10, it was obtained that $F_{count} = 10.013$, with a significance level of 0.05 because the probability (p) = 0.000 is smaller than 0.05, which means there is a significant correlation between learning motivation (X1) and intellectual intelligence (X2) together with students' PAI learning achievement (Y). This shows that jointly learning motivation (X1) and intellectual intelligence (X2) are related to PAI learning achievement (Y). So the alternative hypothesis in the form of a relationship between students' learning motivation (X1) and intellectual intelligence/IQ (X2) together on students' PAI learning achievement (Y) is accepted and the null hypothesis (H_0) is rejected. The hypothesis has been tested/proven; in other words, there is a positive relationship between students' learning motivation (X1) and intellectual intelligence (IQ) (X2), together with their PAI learning achievement (Y).

The first finding shows a positive and significant relationship between motivation and student achievement in PAI subjects. The pure correlation coefficient by controlling the variable of students' PAI learning motivation is 8.3%; the variation can be explained by students' PAI learning motivation, which is expressed by the coefficient of determination (R_2) of 0.083. The simple regression equation from the analysis of variance table (ANOVA) in the form of a simple linear equation formed between the learning motivation variable (X1) and the student's PAI learning achievement variable (Y) is $Y' = 36.21 + 0.29X1$.

The results of the statistical analysis show the motivation to learn PAI has a significant contribution to PAI learning achievement (Y), meaning the higher the learning motivation, the higher the student's PAI learning achievement. Vice versa, the lower the student's learning motivation, the lower their PAI learning achievement.

The second finding shows a positive and significant relationship between intellectual intelligence (IQ) and PAI student achievement. The pure correlation coefficient by controlling the variable of the intellectual intelligence of PAI students is 12.2%; the variation can be explained by the motivation to learn PAI students, which is expressed by the coefficient of determination (R_2) of 0.122. The simple regression equation from the analysis of variance table (ANOVA) in the form of a simple linear equation formed between the learning motivation variable (X1) and the student's PAI learning achievement variable (Y) is $Y' = 14.16 + 0.29X_2$.

The third finding shows a positive and significant relationship between students' PAI learning motivation (X1) and intellectual intelligence/IQ (X2), together with student achievement (Y). It can be seen from the results of multiple regression analysis ($R_y 1.2$) of 0.16. with the significance of the double correlation coefficient F_{count} of 10.013, which indicates the classification is significant at 5% ($\alpha = 0.05$) of 2.00, and 1% ($\alpha = 0.01$) of 2.66, as a comparison and reinforcement in using the analysis.

The findings of this study indicate the importance of the variables of students' learning motivation (X1), and their intellectual intelligence (X2) on student achievement (Y). The two variables combined together are more significant factor to further improve student achievement. This can be interpreted those students who have learning motivation and high intellectual intelligence/IQ, their learning achievement will be higher. On the other hand, students who have low learning motivation and intellectual intelligence will have low PAI learning achievement.

The findings of this study show that there are some students who achieved low value for PAI subject. There are some possible explanations for this. Their learning motivation was low because they do not understand the importance of mastering PAI subjects. The absence of knowledge about the importance of learning a particular subject may reduce to some extent students' motivation to learn (Schik & Phillipson, 2009). Another explanation is that from the outset, they felt that learning PAI subjects was difficult. In addition, they knew their knowledge of PAI was poor. Those circumstance led them to the decision that they gave up to learn the subject. This may cause them to have less motivation to learn PAI subjects (Diseth, 2002). It is understandable when students exhibit intellectual intelligence/IQ which is only below average, they are likely to be less motivated to learn a particular subject (Roy et al., 2013).

Several studies show that intellectual intelligence is one factor that is influential to contribute to students' learning achievement. A person's thinking ability determines the way they think about a particular learning activity. Differences in a person's speed and perfection in solving problems reinforce the opinion that intellectual intelligence exists and is different for each person (Fairuz, 2020). Other research shows that intellectual intelligence is the most important psychological factor in the learning process, so a person's high level of intelligence can increase their chances of succeeding in learning and vice versa (Salichah, 2021).

This study also investigates students' motivation in learning PAI. The motivation variable is another factor that influences student achievement in learning. Several studies show that students who have high learning motivation have a caring attitude towards learning activities and try to remember what the teacher has taught to achieve their learning goals (Hwang et al., 2020). Students' high learning motivation will affect their learning achievement, so they work on practice questions on the subject matter that has been given by the teacher (Putra, 2021; Saputro, 2019). There are also several studies that show intellectual intelligence

and learning motivation can improve students' learning achievement. Langer (2001) shows that students' intellectual intelligence and learning motivation are factors that influence their achievement. In other words, students achieve better when they have better intellectual intelligence and learning motivation.

Several factors contribute to students' learning achievement. This study investigated two factors: intellectual intelligence and motivation. Apart from the result of the present study, student achievement can be influenced by other factors. According to several studies, students' high or low learning achievement can be caused by the learning process of PAI. Their learning achievement can improve when the learning process is more attractive and innovative (Yahaya et al., 2012). Another issue concerns interesting and innovative aspects of teaching and learning. Creativity is seen as one of the factors that is influential in learning and teaching. It can be in the form of the teacher, the media used, the method chosen, the evaluation applied and so on. In other words, creativity can be applied in every aspect of teaching and learning in the classroom.

The result of this study shows that teachers should consider the factor of students' motivation in learning PAI subjects. Teachers should manage their efforts to boost students' motivation in learning PAI subjects. In addition, PAI teachers are in apposition to strengthen students' intellectual intelligence. This factor greatly determines the level of student achievement.

This study has contributed to the body of knowledge concerning the relationship between intellectual intelligence and motivation variables with learning achievement. It has several limitations in terms of method. Further research may investigate the same issue using a more rigorous method.

CONCLUSION

This study was aimed at investigating students' intelligence factor and motivation factor that influence their learning achievement. Based on the results of this study, some conclusions can be drawn. There is significant effect of intellectual intelligence and learning motivation together on student achievement in PAI subjects. This can be interpreted that, if students have higher learning motivation and intellectual intelligence/high IQ, their learning achievement will be higher. In contrast, if students have lower learning motivation and intellectual intelligence, their PAI learning achievement will be poorer. The researchers recommend schools to pay more attention to increase students' learning motivation as well as their intellectual intelligence to achieve better in learning PAI.

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