

The effect of reward on achievement motivation: A study of Airlangga University students participating in academic and nonacademic competitions

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Abstract

Student achievement in academic and nonacademic competitions is shaped not only by individual capability but also by external support, one form of which is reward. This study aims to examine the effect of reward on the achievement motivation of Airlangga University students participating in academic and nonacademic competitions. The study employed a quantitative associative approach with a purposive sampling technique. Data were collected through a five-point Likert-scale questionnaire administered to 86 students who had participated or were currently participating in academic and/or nonacademic competitions and were analyzed using simple linear regression. The results show that reward has a significant effect on achievement motivation ($t = 3.323$; $p = 0.001$), with $R = 0.341$ and $R^2 = 0.116$. Reward explains 11.6% of the variance in achievement motivation, while the remaining 88.4% is explained by factors outside the research model. These findings indicate that reward is one of the external factors associated with students' achievement motivation in competitive settings.

Keywords: Reward; Achievement motivation; University students; Academic competition; Nonacademic competition.

Abstrak

Prestasi mahasiswa dalam kompetisi akademik dan nonakademik bukan semata hasil dari kapasitas individu, melainkan juga dipengaruhi oleh dukungan eksternal, salah satunya *reward*. Penelitian ini bertujuan mengkaji pengaruh *reward* terhadap motivasi berprestasi mahasiswa Universitas Airlangga dalam mengikuti kompetisi akademik dan nonakademik, menggunakan metode kuantitatif asosiatif dengan teknik *purposive sampling*. Data dikumpulkan melalui kuesioner berskala Likert lima poin dari 86 mahasiswa yang memiliki pengalaman mengikuti kompetisi akademik dan/atau nonakademik, lalu dianalisis dengan regresi linear sederhana. Hasil penelitian mengonfirmasi bahwa *reward* berpengaruh signifikan terhadap motivasi berprestasi ($t = 3,323$; $p = 0,001$), dengan nilai R sebesar 0,341 dan R^2 sebesar 0,116. Kontribusi *reward* terhadap variasi motivasi berprestasi tercatat sebesar 11,6%, sedangkan 88,4% sisanya dipengaruhi faktor lain di luar model penelitian. Temuan ini mengindikasikan bahwa *reward* merupakan salah satu faktor eksternal yang berperan dalam motivasi berprestasi mahasiswa saat berkompetisi.

Kata Kunci: Reward; Motivasi berprestasi; Mahasiswa; Kompetisi akademik; Kompetisi nonakademik.

Introduction

The achievements attained by university students in academic and nonacademic competitions depend not only on their abilities or opportunities, but are also influenced by psychological factors that encourage students to set goals, make efforts, and sustain their engagement in achievement-oriented activities. One such factor is achievement motivation, which refers to an individual's drive to attain certain performance standards and achieve better outcomes. In the context of higher education, achievement motivation is associated with students' interest, engagement, and persistence in pursuing academic goals and other forms of achievement (Supriyanto & Sunandar, 2023). Achievement motivation does not always emerge under the same conditions, but may also be associated with the characteristics of the situations individuals encounter. Using an *experience sampling* approach with school and university students, Witte et al. (2024) showed that achievement motivation can fluctuate at the situational level and is associated with characteristics of the experiences individuals are undergoing. In addition, Wang et al. (2026), using data from 53 countries and regions, showed that the relationship between achievement motivation, learning experiences, and anxiety related to academic demands may vary across cultural contexts. These findings indicate that achievement motivation is a complex construct that is relevant to examine in the context of students' achievement-oriented activities, including their involvement in academic and nonacademic competitions.

One external factor that may be associated with achievement motivation is reward. Reward may be provided in the form of recognition, appreciation, or incentives for achievements or desired behaviors. From a motivational perspective, external reward can serve as an initial trigger for individual engagement, but its influence is not always straightforward because it may interact with internal motivational processes. Bardach and Murayama (2025) explain that reward can serve as an initial point of engagement, but once individuals have developed engagement processes that are internally experienced as rewarding, excessive use of external incentives may interfere with long-term engagement. Therefore, reward is relevant not only as a form of compensation for achievement but also as an external factor that may be associated with individuals' motivational experiences. The distinction between intrinsic and extrinsic motivation is also important for explaining students' achievement-oriented behavior, as the drive to engage in an activity may arise not only from the external outcomes obtained but also from the interest and satisfaction derived from the activity itself (Made et al., 2023; Handrianto, 2026). In the context of students participating in competitions, the presence of reward is therefore relevant to examine because competitions involve effort, engagement, achievement orientation, and the possibility of receiving recognition for the outcomes achieved.

The relationship between external factors, motivation, and student achievement has been supported by a number of previous studies. Supriyanto and Sunandar (2023) found a positive relationship between the reward *system* and students' achievement motivation, as well as a positive relationship between achievement motivation and student achievement. These findings provide an empirical basis for understanding that the reward system is associated with achievement motivation in the context of higher education. Affuso et al. (2023) also showed that motivation and *self-efficacy* are part of a process associated with academic achievement over time. Meanwhile, Jiménez-Valverde et al. (2025) showed that the use of gamification can support engagement and intrinsic motivation in the learning process. Delavande et al. (2022) also showed that students' decisions to invest in academic and nonacademic activities are associated with considerations of the benefits obtained from those activities. Although these studies demonstrate connections among motivation, external factors, and achievement-oriented behavior, the contexts of the activities examined and the motivational mechanisms discussed remain diverse. Thus, previous findings provide a basis for examining reward as an external factor associated with achievement motivation, but they have not specifically explained this relationship among students participating in academic and nonacademic competitions.

This research gap becomes more apparent because Supriyanto and Sunandar (2023), although directly examining the reward *system* and students' achievement motivation, conducted their study in an institutional context different from that of the present study. Meanwhile, studies on intrinsic and extrinsic motivation have more commonly examined motivational processes in learning or educational activities in general (Made et al., 2023; Handrianto, 2026), whereas students participating in competitions face achievement-oriented contexts involving targets, competition, sustained effort, and the possibility of success or failure. Bardach and Murayama (2025) also showed that the relationship between reward and motivation needs to be understood by considering its interaction with internal motivational processes. In addition, achievement motivation can be understood as a construct comprising several aspects that may vary according to the characteristics of the situations individuals encounter (Witte et al., 2024). Based on these conditions, this study focuses on Airlangga University students participating in academic and nonacademic competitions to examine whether reward influences achievement motivation. In this study, achievement motivation is understood as a multidimensional construct comprising striving for excellence, persistence, interest and engagement, self-directed achievement, hope for success, and fear of failure. Within this framework, reward is positioned as an external variable, while achievement motivation is positioned as a variable representing students' drive to achieve.

Conceptually, this study is based on the view that reward as an external factor may be associated with individuals' drive to engage in and sustain effort in achievement-

oriented activities, while achievement motivation reflects the drive to attain certain standards, sustain effort, engage in activities, direct achievement through one's own efforts, expect success, and face the possibility of failure. This relationship is not intended to assume that reward is the sole factor determining achievement motivation, as other factors, such as goal orientation and social support, may also play a role in student achievement (Du et al., 2024). The conceptual framework of this study therefore positions reward as the independent variable hypothesized to influence achievement motivation as the dependent variable. Based on this framework, the hypotheses proposed are H1: reward has a significant effect on the achievement motivation of Airlangga University students participating in academic and nonacademic competitions, whereas H0: reward does not have a significant effect on the achievement motivation of Airlangga University students participating in academic and nonacademic competitions. The relationship between the variables can be illustrated through the conceptual framework reward (X) → achievement motivation (Y), with achievement motivation as a construct consisting of the six dimensions described above.

This study aims to analyze the effect of reward on the achievement motivation of Airlangga University students participating in academic and nonacademic competitions. This study contributes empirical evidence regarding the relationship between reward and achievement motivation in the context of student competition participants, while also considering achievement motivation as a multidimensional construct. This contribution extends the discussion of external factors associated with students' achievement motivation, particularly in competitive activities that extend beyond classroom learning. Practically, the findings may provide considerations for higher education institutions in designing relevant forms of recognition and support to encourage student engagement in competitive activities. Thus, this study not only empirically examines the relationship between reward and achievement motivation but also provides an understanding of how such external factors can be situated within the context of student achievement through academic and nonacademic competitions.

Method

This study aims to examine the effect of reward on the achievement motivation of Airlangga University students participating in academic and nonacademic competitions using a quantitative approach and an associative research design. The quantitative approach was employed because the research data are numerical and analyzed statistically to obtain objective and measurable results (Waruwu et al., 2025). Meanwhile, the associative research design was used to identify the relationships and effects between the variables under investigation. In this study, reward was positioned as the independent variable, while achievement motivation was positioned as the dependent variable. Reward was defined as a form of recognition, appreciation, and

benefits provided to students for their participation in or achievements in academic and nonacademic competitions, referring to Armstrong's reward *management* approach and the study by Supriyanto and Sunandar (2023). Achievement motivation refers to students' drive to set goals, develop abilities, sustain effort, and achieve certain performance standards through competition, based on McClelland's (1961) concept of the need for achievement and the study by Du et al. (2024). The operational definitions, dimensions, and indicators of the two variables are presented in Table 1 and were subsequently used as the basis for developing the research instrument.

Table 1. Operational Definitions of Variables

Variable	Dimension	Indicator
Reward (X)	Financial reward	Provision of financial rewards in the form of scholarships or tuition subsidies
		Material assistance or funding for competitions
		Provision of financial rewards proportional to the level of competition difficulty
	Recognition	Recognition of achievements through certificates or awards
		Social appreciation of achievements through publication
		Support for skill development
	<i>Structural Benefits</i>	Policy for converting course credits or SKPI points
		Easily accessible operational and accommodation assistance from the university
Achievement Motivation (Y)	Striving for Excellence	Orientation toward high achievement standards
		Desire to improve achievement
		Desire to achieve superior results
	Persistence	Persistence in facing difficulties
		Consistency in achieving goals
		Not giving up easily
	Interest and Engagement	Interest in achievement-oriented activities
		Active involvement in achievement-oriented activities
	Self-Directed Achievement	Initiative in achieving goals
		Setting achievement targets
		Managing effort to achieve targets
	Hope for Success	Desire to achieve success

Fear of Failure	Belief in the possibility of success
	Willingness to face challenges to achieve success
	Concern about experiencing failure
	Tendency to avoid failure

Source: Author's compilation, 2026.

The population consisted of active Airlangga University students who had experience participating in academic and/or nonacademic competitions, including those who were currently participating or had previously participated in competitions. The sample was selected using a *non-probability sampling* technique with *purposive sampling*, in which respondents were selected based on specific criteria relevant to the objectives of the study (Subhaktiyasa, 2024; Iqbal et al., 2026; Choeron & Nofiana, 2023). This technique enabled the study to obtain respondents whose characteristics and experiences were relevant to the variables examined. A similar approach was also employed by Wijayanti et al. (2024) in selecting respondents based on characteristics relevant to the research requirements.

Data collection was conducted from September 14 to 16, 2026, resulting in 86 respondents who met the research criteria. The research instrument was a questionnaire using a five-point Likert scale, ranging from (1) Strongly Disagree to (5) Strongly Agree. The collected data were then processed using IBM SPSS Statistics. The analysis began with the presentation of respondent characteristics using frequency analysis, followed by validity and reliability testing of the research instrument. After the instrument met the established criteria, classical assumption tests were conducted, including linearity, normality, and heteroscedasticity tests. The subsequent stages included simple linear regression analysis, hypothesis testing using the *t*-test and *F*-test, and the coefficient of determination (R^2). All stages of the analysis were conducted to examine the effect of reward on the achievement motivation of Airlangga University students in academic and nonacademic competitions and to determine the extent to which reward explains the variation in achievement motivation.

Results and Discussion

Respondent characteristics: Sex, age, and competition experience

Respondent characteristics provide an overview of the profile of the students who served as the data sources for this study. The study involved 86 Airlangga University students who had previously participated or were currently participating in academic and/or nonacademic competitions. The characteristics analyzed included sex, age, type of competition, and number of competitions previously participated in. Presenting these characteristics provides context for the research data before proceeding to instrument testing and analysis of the relationships between variables. Based on the data obtained, the respondents had diverse demographic backgrounds

and competition experiences, although certain groups accounted for larger proportions. To provide a clearer overview of the respondents' demographic composition, the distribution by sex and age is presented in Table 2.

Table 2. Respondent demographic characteristics

Characteristic	Category	n	%
Sex	Male	15	17.4
	Female	71	82.6
Age	14–18 years	1	1.2
	19–24 years	85	98.8

Source: SPSS (2026).

Based on Table 2, 71 respondents, or 82.6%, were female, while 15 respondents, or 17.4%, were male. In terms of age, 85 respondents, or 98.8%, were in the 19–24 age group, while 1 respondent, or 1.2%, was in the 14–18 age group. Thus, the research sample was predominantly composed of female students and respondents aged 19–24 years. This composition describes the main characteristics of the respondents involved in the study but was not used to draw conclusions about differences in achievement motivation based on sex or age because these characteristics were not examined as comparative variables. Demographic data serve as descriptive information to help readers understand the context of the sample before the results of the testing of the reward and achievement motivation variables are discussed further.

In addition to demographic characteristics, respondents' competition experience was also an important part of the sample profile. This is directly related to the respondent criteria established in the study, namely students who had previously participated or were currently participating in academic and/or nonacademic competitions. Based on the data obtained, respondents had experience in different types of competitions and varied in the number of competitions in which they had participated. Some respondents participated in academic competitions, others in nonacademic competitions, while some had experience in both types of competitions. To present the distribution of these experiences in a more structured manner, characteristics based on the type and number of competitions are presented in Table 3.

Table 3. Respondents' competition experience

Characteristic	Category	n	%
Type of competition	Academic	41	47.7
	Nonacademic	31	36.0
	Academic and nonacademic	14	16.3
Number of competitions	1–10 times	80	93.0

11–20 times	3	3.5
21–30 times	2	2.3
>30 times	1	1.2

Source: SPSS (2026).

Based on Table 3, 41 respondents, or 47.7%, participated in academic competitions, 31 respondents, or 36.0%, participated in nonacademic competitions, and 14 respondents, or 16.3%, participated in both types of competitions. In terms of the number of participations, 80 respondents, or 93.0%, had participated in 1–10 competitions. Meanwhile, 3 respondents, or 3.5%, had participated in 11–20 competitions, 2 respondents, or 2.3%, had participated in 21–30 competitions, and 1 respondent, or 1.2%, had participated in more than 30 competitions. These data indicate that most respondents had participated in competitions between 1 and 10 times, with academic competitions being the most common type. This characteristic provides an overview of the respondents' competitive experience, which serves as the context for understanding the research data.

Overall, the respondent characteristics indicate that the study involved students with diverse demographic profiles and competition experiences, although the distribution of respondents was concentrated in several groups. Most respondents were female and aged 19–24 years, while in terms of experience, most had participated in 1–10 competitions, with academic competitions representing the largest group. This information is important for providing context for the analyzed data but was not used as a basis for drawing conclusions regarding the effect of reward on Achievement Motivation. Conclusions regarding the relationship between the two variables were instead determined through the statistical tests conducted in the study. Thus, respondent characteristics serve as an initial description of the sample context before the discussion proceeds to instrument testing and hypothesis analysis.

Instrument testing: validity and reliability

Instrument testing was conducted to ensure that the questionnaire used in the study was able to measure the research variables accurately and consistently. In this study, instrument testing included validity and reliability tests for the reward and achievement motivation variables. The validity test was conducted using the *Pearson Product Moment* correlation, while the reliability test employed *Cronbach's Alpha*, with the assistance of IBM SPSS Statistics. Before conducting the validity test, negatively worded items were subjected to *reverse scoring* to ensure that the direction of scoring was consistent with that of the positively worded items. With 86 respondents, the degrees of freedom were set at 84 based on the formula $df = n - 2$. At a significance level of 0.05 with a two-tailed test, the r table value used was 0.212. An item was considered valid if the r calculated value was > 0.212 and the Sig. (2-tailed) value was < 0.05 .

For the reward variable, testing was conducted on 17 statement items. To present the correlation results for each item, the validity test results for the reward variable are presented in Table 4. The table reports the calculated r value, significance value, r table value, and validity status for each item tested.

Table 4. Validity test results for the reward variable

No.	Item	r calculated	Sig. (2-tailed)	r table	Description
1	X1	0.367	< 0.001	0.212	Valid
2	X2	0.536	< 0.001	0.212	Valid
3	X3	0.505	< 0.001	0.212	Valid
4	X4	0.259	0.016	0.212	Valid
5	X5	0.551	< 0.001	0.212	Valid
6	X6	0.588	< 0.001	0.212	Valid
7	X7	0.334	0.002	0.212	Valid
8	X8	0.482	< 0.001	0.212	Valid
9	X9	0.498	< 0.001	0.212	Valid
10	X10	0.559	< 0.001	0.212	Valid
11	X11	0.395	< 0.001	0.212	Valid
12	X12	0.430	< 0.001	0.212	Valid
13	X13	0.440	< 0.001	0.212	Valid
14	X14	0.384	< 0.001	0.212	Valid
15	X15	0.509	< 0.001	0.212	Valid
16	X16	0.464	< 0.001	0.212	Valid
17	X17	0.357	< 0.001	0.212	Valid

Source: SPSS (2026).

Based on Table 4, all 17 statement items for the reward variable met the established validity criteria. The calculated r values ranged from 0.259 to 0.588, with all values exceeding the r table value of 0.212. In addition, all items had Sig. (2-tailed) values below 0.05, including item X4, which had a significance value of 0.016 and a calculated r value of 0.259, representing the lowest correlation value in the instrument. Meanwhile, the highest calculated r value was found for item X6, at 0.588. These results indicate that each statement item had a relationship with the measured variable that met the established criteria. Thus, all 17 reward items were considered valid and could be used in the subsequent analysis.

The next test was conducted on the achievement motivation variable, which consisted of 31 statement items. The validity test results for each item are presented in Table 5 using the same criteria, namely comparing the calculated r value with the r table value

of 0.212 and considering the Sig. (2-tailed) value. This presentation allows each item in the achievement motivation instrument to be examined based on its correlation results.

Table 5. Validity test results for the achievement motivation variable

No.	Item	<i>r</i> calculated	Sig. (2-tailed)	<i>r</i> table	Description
1	Y1	0.573	< 0.001	0.212	Valid
2	Y2	0.721	< 0.001	0.212	Valid
3	Y3	0.517	< 0.001	0.212	Valid
4	Y4	0.528	< 0.001	0.212	Valid
5	Y5	0.572	< 0.001	0.212	Valid
6	Y6	0.554	< 0.001	0.212	Valid
7	Y7	0.381	< 0.001	0.212	Valid
8	Y8	0.471	< 0.001	0.212	Valid
9	Y9	0.349	< 0.001	0.212	Valid
10	Y10	0.609	< 0.001	0.212	Valid
11	Y11	0.549	< 0.001	0.212	Valid
12	Y12	0.743	< 0.001	0.212	Valid
13	Y13	0.649	< 0.001	0.212	Valid
14	Y14	0.560	< 0.001	0.212	Valid
15	Y15	0.350	< 0.001	0.212	Valid
16	Y16	0.691	< 0.001	0.212	Valid
17	Y17	0.698	< 0.001	0.212	Valid
18	Y18	0.724	< 0.001	0.212	Valid
19	Y19	0.723	< 0.001	0.212	Valid
20	Y20	0.476	< 0.001	0.212	Valid
21	Y21	0.667	< 0.001	0.212	Valid
22	Y22	0.510	< 0.001	0.212	Valid
23	Y23	0.593	< 0.001	0.212	Valid
24	Y24	0.506	< 0.001	0.212	Valid
25	Y25	0.724	< 0.001	0.212	Valid
26	Y26	0.510	< 0.001	0.212	Valid
27	Y27	0.221	0.041	0.212	Valid
28	Y28	0.330	0.002	0.212	Valid
29	Y29	0.631	< 0.001	0.212	Valid

30	Y30	0.317	0.003	0.212	Valid
31	Y31	0.510	< 0.001	0.212	Valid

Source: SPSS (2026).

Based on Table 5, all 31 statement items for the achievement motivation variable met the validity criteria. The calculated r values ranged from 0.221 to 0.743, and all were greater than the r table value of 0.212. The significance values for all items were also below 0.05. Item Y27 had the lowest calculated r value, at 0.221, with a significance value of 0.041, but still met the established threshold. Conversely, the highest calculated r value was found for item Y12, at 0.743. Based on these results, no items needed to be removed from the achievement motivation instrument. Thus, all 31 items were considered valid and could be used for subsequent testing. The validity results for both variables show that all 48 statement items met the criteria used in the study.

After validity was established, reliability testing was conducted to assess the internal consistency of the instrument. The test used *Cronbach's Alpha*, with values above 0.60 indicating that the instrument was reliable. The reliability test results for the two variables are summarized in Table 6 so that the results can be compared directly.

Table 6. Reliability test results for the research instruments

Variable	Cronbach's Alpha	N of Items	Description
reward	0.737	17	Reliable
Achievement motivation	0.912	31	Highly reliable

Source: SPSS (2026).

Based on Table 6, the reward variable obtained a *Cronbach's Alpha* value of 0.737 across 17 items, placing it in the reliable category. Meanwhile, the achievement motivation variable obtained a *Cronbach's Alpha* value of 0.912 across 31 items, placing it in the highly reliable category. Both values exceeded the minimum threshold of 0.60 used in the study. These results indicate that the items in each instrument demonstrated adequate internal consistency for data collection and analysis. With the validity and reliability criteria met for both variables, the research instrument was considered suitable for use in the subsequent analysis. The study could then proceed to assumption testing and regression analysis to examine the relationship between reward and the achievement motivation of Airlangga University students.

Classical assumption tests: linearity, normality, and heteroscedasticity

Classical assumption tests were conducted to ensure that the data met the requirements necessary before performing simple linear regression analysis. In this study, the tests included linearity, normality, and heteroscedasticity. The linearity test was used to determine whether the relationship between reward and achievement motivation followed a linear pattern. The normality test was used to determine

whether the residuals in the model were normally distributed, while the heteroscedasticity test was used to determine whether there was unequal residual variance in the regression model. All three tests were conducted with the assistance of IBM SPSS Statistics. The results were used as a basis for assessing the suitability of the model before proceeding to regression analysis and hypothesis testing. Thus, assumption testing served not only as a statistical procedure but also helped ensure that the regression results could be interpreted according to the characteristics of the data obtained from the 86 respondents.

The first test was the linearity test between reward as the independent variable and achievement motivation as the dependent variable. The assessment was based on the significance values for *Linearity* and *Deviation from Linearity*. A relationship was considered linear when the *Linearity* component showed a significance value below 0.05 and there was no significant deviation from linearity. The results of the linearity test are presented in Table 7.

Table 7. Linearity test results

Component	F	Sig.
<i>Linearity</i>	11.168	0.002
<i>Deviation from Linearity</i>	1.030	0.454

Source: SPSS (2026).

Based on Table 7, the *Linearity* component had an F value of 11.168 with a Sig. value of 0.002. This significance value is lower than 0.05, indicating a significant linear relationship between reward and achievement motivation. Meanwhile, the *Deviation from Linearity* component produced an F value of 1.030 with a Sig. value of 0.454. This value is greater than 0.05, indicating no significant deviation from the linear relationship. These results show that the relationship between reward and achievement motivation met the linearity assumption. With this assumption satisfied, the relationship between the two variables could be analyzed using simple linear regression. The classical assumption testing was then continued by examining the distribution of the residuals through the normality test to ensure that the model residuals met the distributional assumption required for regression analysis.

The normality test was conducted on the *unstandardized residuals* using the *One-Sample Kolmogorov-Smirnov Test* with data from 86 respondents. The testing criterion was based on the significance value, with residuals considered normally distributed when the Sig. value was greater than 0.05. In this study, the test results showed an Asymp. Sig. (2-tailed) value of 0.200 and a Monte Carlo Sig. (2-tailed) value of 0.937. Both values were above the significance threshold of 0.05. The complete results of the normality test are presented in Table 8.

Table 8. Normality test results using the *One-Sample Kolmogorov-Smirnov Test*

Statistic	Value
N	86
Test Statistic	0.046
Asymp. Sig. (2-tailed)	0.200
Monte Carlo Sig. (2-tailed)	0.937
99% CI Lower Bound	0.931
99% CI Upper Bound	0.943

Source: SPSS (2026).

Based on Table 8, the Asymp. Sig. (2-tailed) value was 0.200 and the Monte Carlo Sig. (2-tailed) value was 0.937, both of which were greater than 0.05. These results indicate that the research residuals did not show a significant deviation from a normal distribution, indicating that the normality assumption was satisfied. The next test was heteroscedasticity, which was conducted using a *Scatterplot*. In this test, the presence of a particular pattern in the distribution of residual points was used as the basis for assessing the presence of heteroscedasticity. The results showed that the residual points were distributed around 0 on the Y-axis and did not form a particular pattern, as shown in Figure 1.

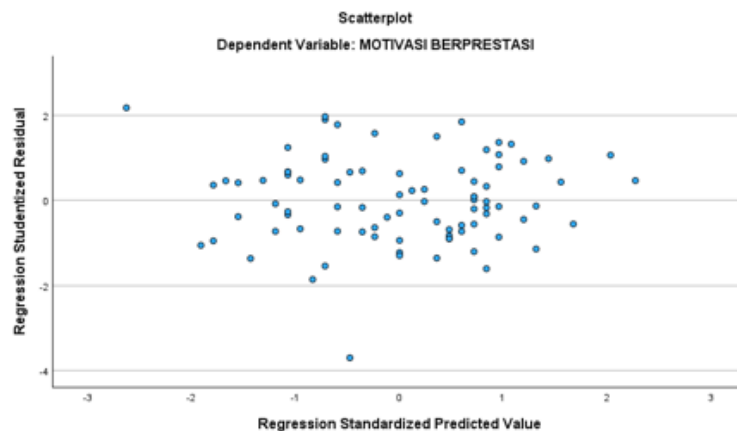


Figure 1. Heteroscedasticity test results

Source: SPSS (2026).

Based on Figure 1, the residual points appeared to be randomly distributed above and below 0 on the Y-axis without forming a particular pattern, such as a narrowing, widening, or wave-like pattern. This distribution indicates that there was no indication of heteroscedasticity in the tested model. Thus, the homoscedasticity assumption was considered satisfied. Overall, the results of the linearity, normality, and heteroscedasticity tests indicate that the research data met the assumptions required to proceed with simple linear regression analysis. These findings provide a basis for

continuing to test the effect of reward on the achievement motivation of Airlangga University students through regression analysis and hypothesis testing.

Simple linear regression analysis and hypothesis testing

Simple linear regression analysis was used to examine the relationship and direction of the effect of reward on the achievement motivation of Airlangga University students participating in academic and nonacademic competitions. The analysis involved one independent variable, namely reward, and one dependent variable, namely achievement motivation. Mathematically, the simple linear regression model is formulated as follows:

$$Y = a + bX$$

Description:

Y = Achievement Motivation

a = constant

b = regression coefficient

X = reward

The equation was used to describe changes in the predicted value of achievement motivation based on changes in the value of reward. The analysis was conducted on 86 respondents using SPSS. The constant, regression coefficient, *standard error*, Beta, *t*, and significance values were used to determine the direction of the relationship and the significance of the effect of the independent variable on the dependent variable. The results of the simple linear regression analysis are presented in Table 9.

Table 9. Simple linear regression analysis results

Model	B	Std. Error	Beta	<i>t</i>	Sig.
(Constant)	82.984	10.691	–	7.762	<0.001
reward	0.607	0.183	0.341	3.323	0.001

Source: SPSS (2026).

Based on Table 9, the constant was 82.984 and the regression coefficient for reward was 0.607. Substituting these values into the regression equation produced the equation $Y = 82.984 + 0.607X$. The constant of 82.984 indicates the predicted value of achievement motivation when the value of reward is zero. Meanwhile, the regression coefficient of 0.607 indicates that every one-unit increase in reward is accompanied by an increase of 0.607 units in the predicted value of achievement motivation. The positive regression coefficient indicates that the two variables have a positive relationship. In other words, the higher the reward received or perceived by students, the higher the predicted value of achievement motivation in the research model. The Beta value of 0.341 also indicates a positive direction of the relationship between the

two variables. The significance of the regression coefficient was subsequently tested using the *t*-test.

The *t*-test was used to determine the significance of the effect of reward on achievement motivation partially. Based on the test results, the calculated *t* value was 3.323 with a significance value of 0.001. With 86 respondents, the degrees of freedom were 84, resulting in a *t* table value of 1.989 at a 5% significance level. The calculated *t* value of 3.323 was greater than the *t* table value of 1.989. In addition, the significance value of 0.001 was lower than 0.05. Based on these two criteria, H₀ was rejected and H₁ was accepted. These results indicate that reward had a significant effect on the achievement motivation of students participating in academic and nonacademic competitions. Thus, the partial test results provide statistical support for the research hypothesis stating that reward affects students' achievement motivation.

In addition to the *t*-test, model significance was tested using the F-test. The F-test was used to determine whether the regression model as a whole was significant in explaining achievement motivation based on the reward variable. The test was conducted by comparing the calculated F value with the F table value and considering its significance value. With 86 respondents, the numerator degrees of freedom were 1 and the denominator degrees of freedom were 84. At a 5% significance level, the F table value used was 3.955. The test results showed a calculated F value of 11.044 with a significance value of 0.001. The detailed F-test results based on the SPSS data analysis are presented in Table 10.

Table 10. F-test results (model significance)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	2,189.917	1	2,189.917	11.044	0.001
Residual	16,657.118	84	198.299		
Total	18,847.035	85			

Source: SPSS (2026).

Based on Table 10, the calculated F value of 11.044 was greater than the F table value of 3.955, while the significance value of 0.001 was lower than 0.05. Thus, H₀ was rejected and H₁ was accepted. These results indicate that the regression model incorporating reward as the independent variable was significant in explaining students' achievement motivation. The F-test results are consistent with the *t*-test results, which showed a significant effect of reward on achievement motivation partially. However, model significance does not indicate that reward is the only factor associated with achievement motivation. Therefore, interpretation of the regression results needs to be continued by examining the coefficient of determination to determine the proportion of variation in achievement motivation that can be explained

by reward in the research model. The results of the coefficient of determination test are presented in Table 11.

Table 11. Coefficient of determination test results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.341	0.116	0.106	14.082

Source: SPSS (2026).

Based on Table 11, the *R Square* value of 0.116 indicates that reward explains 11.6% of the variation in students' achievement motivation. The coefficient of determination was calculated using the following formula:

$$KD = R^2 \times 100\%$$

Description:

KD = Coefficient of Determination

R Square = *R Square*

Based on the obtained *R Square* value, the coefficient of determination was calculated as follows:

$$KD = 0,116 \times 100\% = 11,6\%$$

These results indicate that 11.6% of the variation in achievement motivation can be explained by reward in the research model, while the remaining 88.4% is not explained by the model. The *Adjusted R Square* value of 0.106 represents the coefficient of determination adjusted for the number of predictors and the sample size. Thus, reward has a positive and significant relationship with achievement motivation, but its contribution to explaining variations in motivation remains limited. This finding indicates that students' achievement motivation in participating in academic and nonacademic competitions is also associated with other factors not included in the research model. Overall, the results of the regression analysis and hypothesis testing indicate that reward has a significant effect on achievement motivation, with a contribution of 11.6%.

The effect of reward on students' achievement motivation in academic and nonacademic competitions

In academic and nonacademic competitions, students' drive to achieve is not always derived solely from personal desire. Rewards received after demonstrating effort and achievement may provide an additional reason to sustain engagement in competitions, particularly throughout the process of preparation and goal attainment. This pattern is evident in the present study, in which reward was found to have a significant effect on the achievement motivation of Airlangga University students. This means that the more positively students perceive the rewards they receive, the greater their tendency

to sustain their achievement-oriented drive. This finding is consistent with Supriyanto and Sunandar (2023), who demonstrated an association between the reward system and students' achievement motivation. Lintner (2024) further supports this relationship through a meta-analysis of 18 *randomized controlled trials* involving 20,286 students, which found that incentives were associated with increases in course credits, grades, and examination outcomes.

The drive to continue making efforts is important because achievement in competitions does not develop through a single, momentary action. Students need to devote time, practice, prepare themselves, and face the possibility of failure before obtaining the expected outcomes. In this context, reward in the present study can be understood as one stimulus that helps sustain effort. Barrow et al. (2018), through a study of *performance-based scholarships* among higher education students in the United States, found that incentives encouraged students to allocate more time and effort to educational activities, although this effect did not necessarily persist after the scholarship eligibility requirements ended. Lintner (2024) also found that the magnitude of incentives did not consistently differentiate their effects on educational outcomes. Thus, the findings of this study highlight the importance of the presence of reward as a stimulus, rather than suggesting that greater rewards always produce higher levels of motivation.

The relationship between rewards and motivation does not operate in an entirely uniform manner. Students may respond differently to the same reward because the characteristics of the activity and the conditions surrounding it also shape their experiences. This helps explain why reward had a significant effect in the present study but did not explain students' achievement motivation in its entirety. Le (2020), through a review of 21 studies on financial incentives, found that incentives were generally associated with improved learning outcomes, but their effects varied across academic fields, with positive effects being more evident in mathematics than in reading or *language arts*. Fricke et al. (2018) also found differences across cohorts of first-year university students in Switzerland: participation increased by 47% and grades increased by 0.14 *standard deviation* in one cohort, but no increase in grades was found in the subsequent cohort. These differences demonstrate the importance of context when interpreting the findings of the present study.

Behind externally provided rewards, students still possess internal drives that influence how they respond to competition. Reward may provide an initial stimulus or reinforce effort, but sustained engagement does not always depend on rewards. Bardach and Murayama (2025) explain that external rewards can encourage engagement, but their effects depend on their interaction with internal motivation. This finding is consistent with Howard et al. (2021), whose meta-analysis of 344 samples involving 223,209 participants showed a positive relationship between

intrinsic motivation and various adaptive outcomes, whereas external regulation did not show a similar relationship with performance and persistence. Wang et al. (2024) also found, through 36 educational interventions involving 11,792 participants, that interventions based on *self-determination theory* could enhance autonomy, competence, and intrinsic motivation. Li et al. (2024) further complemented these findings: a meta-analysis of 35 interventions involving 2,500 participants found a small but significant effect on intrinsic motivation, as well as positive effects on autonomy and relatedness.

Students' achievement motivation also does not necessarily remain constant from one situation to another. A student may be highly motivated when facing a particular competition but display a different level of motivation when facing other demands. Witte et al. (2024) showed that achievement motivation has a situational component and can change according to how individuals perceive the situations they encounter. This finding provides context for the results of the present study at Airlangga University, as the respondents had diverse competition experiences, both academic and nonacademic, with varying numbers of previous competitions. Wang et al. (2026) also showed that achievement motivation is associated with cultural contexts through an analysis of data from 53 countries and regions. Therefore, the effect of reward identified in the present study is more appropriately situated within students' competition experiences rather than understood as a mechanism that operates identically under all conditions.

The magnitude of the contribution of reward in this study shows that achievement motivation has a broader explanatory scope than rewards alone. An R^2 value of 0.116 indicates that reward explains 11.6% of the variation in students' achievement motivation, while the remaining 88.4% lies outside the model. This figure indicates that reward has a meaningful relationship with achievement motivation but is not the only factor shaping motivation. Li et al. (2023), in a study of 1,076 university students in Anhui, China, demonstrated an association between achievement motivation, *general self-efficacy*, and social support. Zheng et al. (2020) also identified *self-efficacy*, academic motivation, and *self-regulation* as factors associated with academic achievement among medical students. Meanwhile, Affuso et al. (2023) showed that motivation and *self-efficacy* are part of a process associated with academic performance over time. These findings further support the interpretation of the 88.4% of variation not explained by the present study.

The 88.4% of variation not explained by reward indicates that students' experiences in pursuing achievement may be shaped by a combination of personal and environmental factors. In competitions, students require not only rewards but also clear goals and social support. Du et al. (2024) demonstrated a relationship between social support, *goal orientation*, and academic achievement among university students in China. This finding can be considered alongside Ma and Caiga (2024), who

examined 410 university students in China and found a positive relationship between social support, learning motivation, and *achievement goal orientation*, with learning motivation serving as a mediator. These two studies help broaden the interpretation of the findings of the present study. If reward explains 11.6% of the variation in achievement motivation, goal-related factors and social support may constitute part of the additional explanation not included in the research model.

Differences in the forms of rewards are also important when explaining the findings of the present study. Reward is not simply a matter of whether a reward is present or absent, because different forms of rewards may provide different motivational experiences. Yu et al. (2024), for example, showed that forms of rewards in the context of *School-Wide Positive Behavioral Supports* may have different motivational implications. This finding is relevant because the present study measured reward as a single overall construct rather than separating the effects of individual forms of rewards. At the same time, Lintner (2024) showed that incentives in higher education may be associated with improvements in several educational outcomes, but variations in incentive amounts did not consistently produce differences in effects. When considered together with the findings of the present study, these findings indicate that reward can serve as an important stimulus, but its meaning remains dependent on the form, context, and motivational processes accompanying it.

Conclusion

This study shows that reward has a significant effect on the achievement motivation of Airlangga University students participating in academic and nonacademic competitions, with a regression coefficient of 0.607, a *t* value of 3.323, and a significance value of 0.001. These findings indicate that students' perceptions of rewards can serve as an external stimulus that strengthens their drive to achieve. However, the significance of this finding does not lie in assuming that reward is the primary source of students' motivation, but rather in its position as one component of the motivational environment in competitive situations. This is reflected in the R^2 value of 0.116, indicating that reward explains only 11.6% of the variation in achievement motivation, while the remaining 88.4% lies outside the model. Thus, the effect of reward needs to be understood as part of a motivational process that also involves students' internal, social, and situational factors.

This study contributes to the understanding of the role of external factors in shaping students' achievement motivation, particularly in the context of academic and nonacademic competitions in higher education. Practically, these findings may serve as a consideration for higher education institutions in designing forms of rewards as part of their support for students participating in competitions, without overlooking other motivational factors. Nevertheless, this study is limited to 86 Airlangga University students, employs a *cross-sectional* design, and measures reward based on

respondents' perceptions; therefore, the findings should be generalized with caution. The study also includes only reward as the independent variable. Future research could employ more diverse samples and longitudinal designs while incorporating *self-efficacy*, *goal orientation*, social support, intrinsic motivation, competition experience, and perceived competence to obtain a more comprehensive understanding of the development of students' achievement motivation.

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