Lentera Pendidikan : Jurnal Ilmu Tarbiyah dan Keguruan
Vol. 28, No. 1, June 2025, pp. 1-16
ISSN: 1979-3472 (Print) 2580-5223 (Online)
Doi: https://doi.org/10.24252/lp.2025v28n1i1

Academic Reasoning and Literacy-Based Tests: Evaluating Their Effectiveness in Predicting Prospective Students' Potential in Indonesia

Kusaeri[1*], Abdul Mujib[2], Nursalam[3]
[1]Universitas Islam Negeri Sunan Ampel Surabaya, Indonesia
[2]Universitas Islam Negeri Syarif Hidayatullah Jakarta, Indonesia
[3]Universitas Islam Negeri Alauddin Makassar, Indonesia
Correspondence Email: kusaeri@uinsa.ac.id

Received May 05, 2025; Revised June 16, 2025; Accepted June 18, 2025;
Available Online June 22, 2025

Abstract:

The enrollment test for prospective students at Islamic State Universities (Perguruan Tinggi Keagamaan Islam Negeri, or PTKIN) in Indonesia carries significant implications-not only for the students themselves but also within the broader social context. Consequently, there is a pressing need for a valid selection instrument capable of objectively predicting the academic potential of prospective students. This study aims to assess the effectiveness of academic reasoning and literacy-based tests as predictors of academic potential among PTKIN applicants. This research adopts a cross-sectional design to analyze the relationship between UMPTKIN scores and students' Grade Point Averages (GPAs) during their first two semesters. The dataset comprises 2023 UMPTKIN scores and GPAs of 2,161 students from UIN Syarif Hidayatullah Jakarta and UIN Alauddin Makassar. Data were obtained from the National UMPTKIN Committee and the Information Technology Centers and Databases of the respective PTKINs. Data analysis was conducted using SPSS 24, employing descriptive statistics, Pearson correlation, and multiple linear regression. The results reveal a weak correlation between academic reasoning and literacy scores and students' academic performance, though the degree of influence varies across academic programs. These findings underscore the need to develop more targeted selection approaches aligned with the specific characteristics of each academic program in order to enhance academic outcomes at PTKINs. Accordingly, policymakers involved in student selection processes should prioritize the development and implementation of more valid and program-sensitive selection instruments.

Abstrak:

Seleksi calon mahasiswa di Perguruan Tinggi Keagamaan Islam Negeri (PTKIN) di Indonesia memiliki dampak yang signifikan, baik pada individu mahasiswa maupun dalam konteks sosial yang lebih luas. Untuk itu, diperlukan instrumen seleksi yang valid dan dapat memprediksi potensi akademik calon mahasiswa secara objektif. Penelitian ini bertujuan untuk menguji efektivitas tes penalaran akademik dan tes literasi sebagai prediktor potensi akademik calon mahasiswa PTKIN. Desain penelitian yang digunakan adalah *cross-sectional*, yang memungkinkan analisis hubungan antara skor UMPTKIN dan Indeks Prestasi Kumulatif (IPK) mahasiswa pada dua semester pertama. Data penelitian mencakup skor UMPTKIN 2023 dan IPK dari 2.161 mahasiswa yang diterima melalui UMPTKIN 2023 di UIN Syarif Hidayatullah Jakarta dan UIN Alauddin Makassar. Data dikumpulkan dari Panitia Nasional UMPTKIN dan Pusat Teknologi Informasi serta Pangkalan Data masing-masing PTKIN. Analisis data dilakukan menggunakan

SPSS 24, dengan tahapan: analisis deskriptif, korelasi Pearson, dan regresi linier berganda. Hasil penelitian menunjukkan bahwa secara statistik hubungan antara penalaran akademik dan literasi dengan pencapaian akademik mahasiswa tergolong lemah, meskipun kontribusi masing-masing faktor bervariasi antar program studi. Temuan penelitian ini menyoroti pentingnya pengembangan pendekatan seleksi yang lebih spesifik dan disesuaikan dengan karakteristik masing-masing program studi untuk meningkatkan pencapaian akademik mahasiswa di PTKIN. Karenanya, bagi pengambil kebijakan seleksi mahasiswa di PTKIN, perlunya menekankan instrumen seleksi yang lebih valid dan terfokus pada karakteristik program studi.

Keywords:
Predictive Validity, Academic Reasoning, Literacy

How to Cite: Kusaeri**,** Mujib, A., & Nursalam. (2025). Academic Reasoning and Literacy-Based Tests: Are They Effective Predictors of Prospective Students' Potential in Indonesia. *Lentera Pendidikan : Jurnal Ilmu Tarbiyah dan Keguruan,* 28(1), 1-16. https://doi.org/10.24252/lp.2025v28n1i1.

Introduction

The selection of prospective students at higher education institutions is strategically crucial, as it impacts not only learning processes but also the quality of graduates (Güloğlu-Demir & Kaplan-Keleş, 2021; Paris, Pressimone, & Sara, 2023). On the other hand, the outcomes of the selection process determine whether prospective students are admitted into their desired academic programs. Failure to gain admission can lead to consequences beyond individual disappointment, potentially resulting in broader social repercussions (Allahyari, Abbasabady, Akhter, & Alibakhshi, 2023). Thus, failure in the selection process may affect students' self-esteem and shape their future trajectories (Stobart & Eggen, 2012; Marianti, Rufaida, Hasanah, & Nuryanti, 2023).

Given the significant impact of the selection process, the instruments used must accurately assess the abilities of candidates. In other words, selection instruments should possess high predictive validity to objectively reflect the academic potential of prospective students (Fleuren, Klausch, Zwager, & Schoonmade, 2020). Predictive validity refers to the extent to which an instrument can predict future academic performance (Cheng & Han, 2024). Therefore, enrollment test instruments must be carefully and precisely designed to ensure that admitted students are not only academically prepared but also possess the necessary skills and attitudes to thrive in a dynamic university environment and to face complex challenges.

In addition to predictive accuracy, the validity and reliability of enrollment test instruments are essential components of the selection process (Yu, Li, Fischer, & Xu, 2020).

Specifically, predictive validity plays a key role in ensuring that selection tools can accurately forecast the potential for academic success (Villar, Robledo, & Andrade, 2024). Similarly, Bruce, Mabizela, and Tshabalala (2023) found that academic ability and mathematics tests are significant predictors of achievement in higher education. Furthermore, selection instruments must be developed to be fair, inclusive, and free from bias that may disadvantage certain groups, thereby upholding the principles of diversity and equity in student admissions (Jin, Yuyi, & Jihyun, 2024). One of the test instruments commonly used in university admissions in Indonesia, particularly in Islamic higher education institutions (PTKINs), is the academic reasoning or scholastic aptitude test. Muhid, Yusuf, Kusaeri, Novitasari, and Ridho (2020) found a strong relationship between academic reasoning scores and student academic performance in Indonesia. Attitude tests play an important role in predicting academic success, although they are not the most dominant factor. These tests are particularly useful in predicting success when students engage with subject matter unfamiliar to them.

However, in the United States, the use of scholastic aptitude tests in university admissions has faced significant criticism. Tests are not entirely fair, as they tend to benefit students from specific socio-economic backgrounds. Moreover, these tests can negatively impact school learning, as students may spend excessive time preparing for tests that are misaligned with the school curriculum (Atkinson & Geiser, 2009). Conversely, literacy skills have emerged as key indicators of prospective student success, particularly in academic selection contexts. Strong literacy skills encompass not only reading and writing abilities but also critical thinking and analytical capacities essential for understanding and addressing complex problems. Research has shown that literacy forms the foundation of academic competence, enabling students to meet the demands of higher education and enhancing their potential for future success (Sintiawati et al., 2022).

Literacy skills are directly linked to students' analytical reasoning and comprehension abilities, which are primary indicators of academic achievement. Purnamasari and Nuryanto (2020) demonstrated a significant relationship between literacy and academic outcomes, including timely graduation and high academic performance. In addition, literacy is considered a strong predictor of academic success, as it enables students to effectively utilize learning resources (Hou, Ma, Wang, & Qu, 2024). Literacy tests, which are integrated into selection processes across various institutions, have been shown to effectively predict academic readiness and long-term academic performance (Bruce, Mabizela, & Tshabalala, 2023). In light of the above criticisms and observations, the selection process for Islamic State Universities (PTKINs) in Indonesia should consider integrating both scholastic aptitude tests and literacy-based assessments-including mathematical reasoning, reading literacy, and Islamic teachings literacy. Employing both types of assessments could offer a more holistic approach to student selection at PTKINs. However, the effectiveness of these tests in predicting the academic success of admitted students warrants further investigation. Additional studies are needed to determine the predictive validity of these instruments. This will enable PTKINs to

ensure a selection process that is fair, inclusive, and conducive to long-term academic achievement.

Accordingly, this study aims to investigate whether academic reasoning and literacy tests serve as effective predictors of academic potential among prospective PTKIN students in Indonesia. It is hoped that the research will make significant theoretical and practical contributions. Theoretically, it may expand the understanding of the role of academic reasoning and literacy tests in forecasting academic outcomes at the tertiary level, particularly within PTKINs. Practically, the findings could inform efforts to improve the fairness and accuracy of student selection processes. The ultimate goal is to ensure that admitted students possess optimal academic potential, thereby supporting their academic success throughout their studies.

Research Method

This study employed a cross-sectional design, in which data were collected at a single point in time from a sample of students admitted to Islamic State Universities (PTKIN) through the UMPTKIN selection pathway. This design was chosen for its suitability in addressing the research objectives, which aimed to examine the contribution of the Academic Reasoning Test and Literacy Test in predicting students' academic success at PTKINs. The cross-sectional approach allowed the researcher to analyze the relationship between selection test scores and academic outcomes simultaneously (Kusaeri & Aditomo, 2019; Permatasari, Prabandari, & Kristina, 2016).

The data used in this study consisted of two types. First, data on the 2023 UMPTKIN test scores, which included Academic Reasoning Test scores (measuring participants' analytical and logical reasoning skills) and Literacy Test scores, encompassing subdimensions such as mathematical reasoning, reading literacy, and Islamic teachings literacy. Second, Grade Point Average (GPA) data from the first and second semesters of students admitted through the 2023 UMPTKIN pathway, which served as indicators of early academic success at PTKINs. The UMPTKIN test scores were obtained from the National UMPTKIN Committee under the Ministry of Religious Affairs of the Republic of Indonesia, while GPA data were collected from the Information Technology Centers and Databases of the respective PTKINs.

The study population consisted of 40,006 new students admitted through the UMPTKIN pathway in 2023, across 59 PTKINs throughout Indonesia. The research sample comprised 3,513 students admitted to two institutions: UIN Syarif Hidayatullah Jakarta and UIN Alauddin Makassar. These universities were selected based on two primary considerations: (a) both institutions represented among the highest number of UMPTKIN admissions, and (b) they offered diverse demographic and academic characteristics. These criteria were intended to ensure that the findings could be generalized to the broader PTKIN context. However, not all admitted students completed the re-registration process. After verification, a total of 2,161 students were confirmed to have re-registered and remained actively enrolled through the end of the second semester. The final sample for

this study included 2,161 students: 1,125 from UIN Syarif Hidayatullah Jakarta and 1,036 from UIN Alauddin Makassar.

Although the study focused on two universities, their selection was strategic to enhance representativeness within the PTKIN system. UIN Syarif Hidayatullah Jakarta, located in the western region of Indonesia, and UIN Alauddin Makassar, located in the eastern region, collectively reflected the geographical, cultural, and socio-economic diversity present across the PTKIN network. Both universities consistently ranked among the top in terms of the number and diversity of applicants accepted through the UMPTKIN pathway, mirroring national trends in student admissions and academic performance. These attributes supported the rationale that findings from these two institutions could yield meaningful insights and offer reasonable generalizability across PTKINs. Thus, the purposive sampling approach employed balanced feasibility with the aim of maintaining external validity.

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) software, following a stepwise procedure. The first stage involved descriptive analysis to examine data characteristics, including means, standard deviations, and minimum and maximum values for each variable. The second stage utilized Pearson correlation analysis to assess the relationships among the variables-specifically, between the Academic Reasoning Test (TPA), the various subdimensions of the Literacy Test, and GPA. This correlation analysis aimed to determine the extent to which the TPA and literacy components were associated with students' academic performance.

In the final stage, multiple linear regression analysis was employed to identify the predictive contribution of each independent variable to GPA. The literacy subdimensions-including reading literacy (in Arabic, scientific texts, and English), mathematical literacy, and Islamic religious literacy-were treated as independent variables, with GPA as the dependent variable. To enhance the precision of the model, stepwise regression was used to select the most significant predictors, thereby producing a more efficient and reliable model for estimating students' academic potential.

Results and Discussion

The distribution of participants by gender (male and female) and academic program groups – including Religious Studies, Languages, Social Sciences (IPS), and Natural Sciences (IPA) – is presented in Table 1.

Table 1. Distribution of Participants by Gender and Academic Program Group

Aspect	Frequency	Precentage
1. Gender		
Male Students	906	41,93%
Female Students	1.255	58,07%
2. Academic Program		
Religion	1.227	56,78%
Language	275	12,73%
Science	212	9,81%
Social	447	20,68%

The variation in this distribution is highly relevant to analyzing the effectiveness of academic reasoning and literacy tests as predictors of prospective students' academic potential. Differences within these groups may influence performance patterns on both academic reasoning and literacy assessments. For instance, the predominance of female students in this study and in the Religious Studies program group may offer critical context for interpreting literacy test outcomes, particularly in areas related to reading comprehension, text analysis, and critical thinking. Therefore, understanding the demographic and academic composition of the participants is essential for providing deeper insights into students' academic potential across these criteria.

Table 2. Students' Characteristic by Gender and Academic Program

Aspects	Academic Reasoning					Literacy				
	N	Min	Max	Mean	SD	N	Min	Max	Mean	SD
1. Gender										
Male Students	906	0,00	833,6	528,4	102,7	906	348,1	699,2	537,6	61,97
Female Students	1.255	212,9	787,5	528,4	98,12	1.255	348,4	718,9	535,7	58,51
2. Academic Program										
Religion	1.227	0,00	810,5	517,8	96,57	1.227	348,1	696,6	531,3	58,73
Language	275	292,1	833,6	542,3	94,70	275	400,5	699,2	554,4	59,17
Science	212	212,9	787,5	541,5	141,9	212	354,2	655,5	525,6	62,55
Social	447	290,8	794,6	542,7	101,8	447	358,5	718,9	544,9	59,52
Total	2.161	0,00	833,6	528,4	100,0	2.161	348,1	718,9	536,5	59,98

Table 2 shows that students in the Natural Sciences (IPA) program group achieved the highest average academic reasoning score among all academic program groups. However, this group also exhibited the greatest variability in scores, with a standard deviation of 141.89, indicating a more heterogeneous performance. In contrast, in terms of literacy scores, the Social Sciences (IPS) group recorded the highest average (M = 544.95), while the distribution of literacy scores across all groups was relatively consistent, with standard deviations ranging from 58.51 to 62.55. Overall, Table 2 demonstrates clear differences in academic reasoning and literacy performance across program groups, although gender-based distributions appear more uniform.

The correlation analysis, presented in Table 3, revealed a very weak relationship between academic reasoning and Grade Point Average (GPA) ($r = 0.089$), although this relationship was statistically significant ($p < .001$). This finding suggests that academic reasoning made a relatively minor contribution to academic achievement. Similarly, literacy showed a weak yet statistically significant correlation with GPA ($r = 0.109$; $p < .001$), indicating a slightly stronger impact than academic reasoning. These results suggest that while both factors contribute to academic performance, additional variables are likely to have a more substantial influence on students' GPA.

Regarding gender, the analysis indicated no significant correlation with academic reasoning ($r = 0.000$; $p = .991$) or literacy ($r = -0.016$; $p = .469$). Although gender was significantly correlated with GPA ($r = 0.187$; $p < .001$), the strength of this correlation was weak, implying that gender is not a key determinant of academic success. Consequently,

this study focuses on academic reasoning and literacy as more relevant and impactful predictors of students' academic performance.

Table 3. Correlation among Predictors and Subjects' GPA

		Literacy	Gender	GPA
Academic Reasoning	Pearson Correlation	.504**	.000	.089**
	Sig. (2-tailed)	< .001	.991	< .001
	N	2161	2161	2161
Literacy	Pearson Correlation		-.016	.109**
	Sig. (2-tailed)		.469	< .001
	N		2161	2161
Gender	Pearson Correlation			.187**
	Sig. (2-tailed)			< .001
	N			2161

To further explore the contribution of literacy subdimensions to academic achievement, an additional analysis was conducted on specific areas including reading literacy (Arabic, science literacy, and English), mathematical literacy, and Islamic religious literacy. This aimed to identify which literacy components most significantly influenced academic performance across different academic program groups.

A correlational approach was employed to assess the strength and direction of the relationship between each literacy subcategory and GPA. The results, illustrated in Figures 1 and 2, show the relationship patterns between literacy variables and GPA across academic program groups. These findings offer preliminary insights into which literacy dimensions have the most substantial impact on academic achievement.

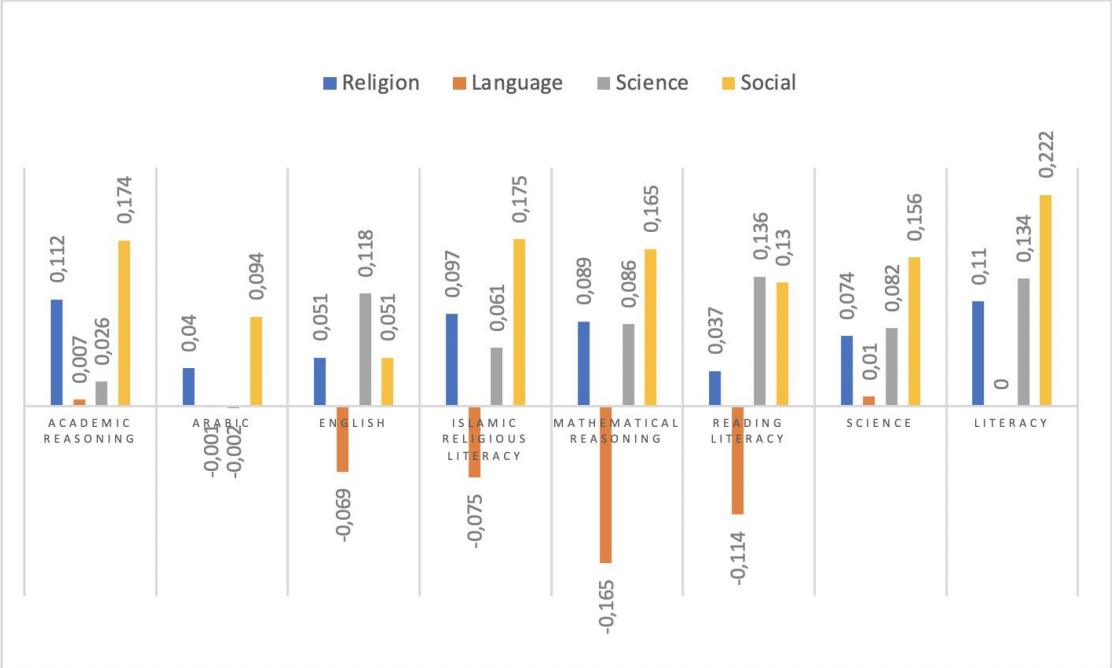

Figure 1. Correlation and Significance among Predictors and Subjects' GPA by Academic Program

Figures 1 and 2 reveal that the relationship between literacy variables and GPA varies significantly across academic program groups. In the Religious Studies program, academic reasoning exhibited the strongest and most statistically significant correlation with GPA (r = 0.112, p = .000), suggesting that enhanced academic reasoning skills are positively associated with improved academic performance within this group. In the Natural Sciences (IPA) program, reading literacy emerged as the most influential predictor of GPA, with a correlation coefficient of r = 0.136. Although this relationship is statistically significant (p = .047), it is still classified as weak. Nevertheless, it indicates that students' reading literacy, particularly in this discipline, plays a meaningful role in shaping their academic outcomes.

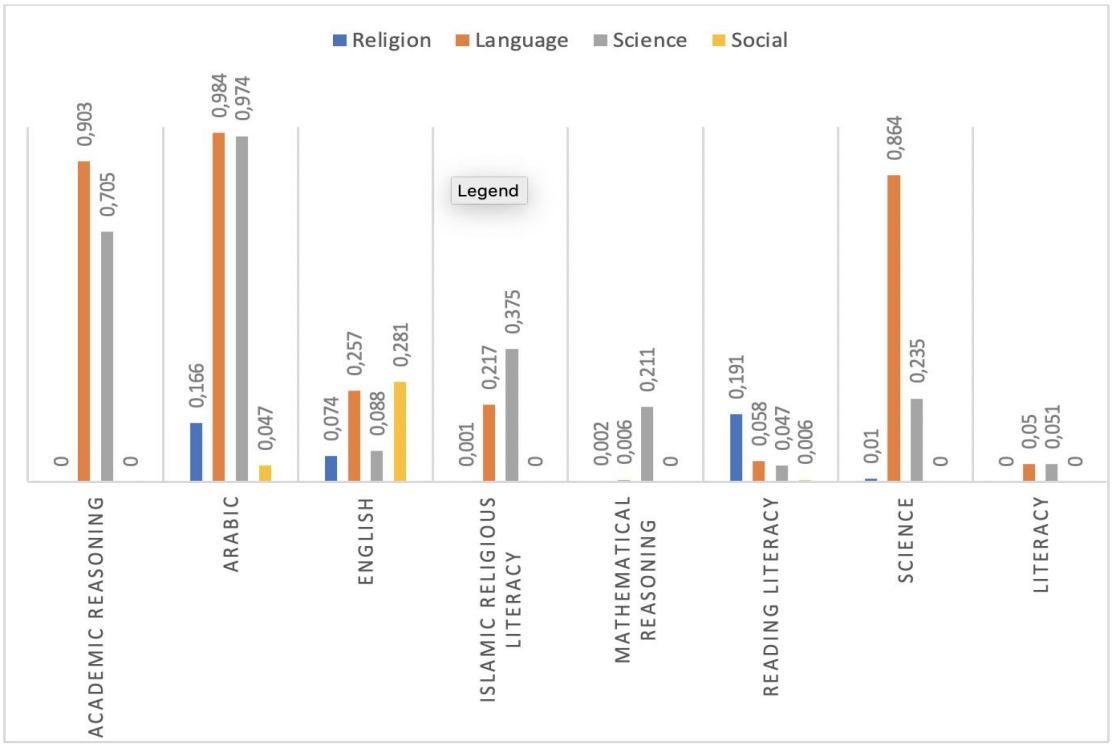

Figure 2. Significance of Predictors and Students' GPA by Academic Program

In contrast, within the Language program group, Islamic Religious Literacy demonstrated the strongest positive correlation with GPA, with a correlation coefficient of r = 0.175 and a high level of statistical significance (p < .001). This finding suggests that proficiency in Islamic Religious Literacy plays a substantial role in supporting academic achievement in this field of study. However, most other predictor variables in the Language program group did not show statistically significant relationships with GPA. An exception is Mathematical Reasoning, which exhibited a significant negative correlation with GPA (r = -0.165, p = .006). This indicates an inverse relationship, where higher scores in mathematical reasoning were associated with lower GPA outcomes among students in the Language program. To further explore the contribution of each predictor, regression analysis was conducted using a simultaneous entry method, wherein all predictors were included in the initial model regardless of statistical significance. Subsequently, a stepwise

regression approach was applied to identify predictors that contributed most significantly and uniquely to the dependent variable, GPA. Predictors highly correlated with others were excluded to prevent multicollinearity, which can distort model accuracy and interpretability. The complete summary of the regression analysis results is presented in Table 4.

Table 4. The Summary of Regression Analysis Result for All Predictors

	significant predictor	Precentage (%) GPA variant from significant predictor					
		BA, BING	LAI, LN, PM	LAI, LN, PM, PA	LAI, LN, PM, PA, BA	LAI, LN, PM, PA, BA, BING	LAI, LN, PM, PA, BA, BING, SA (stepwise)
Religion	PA, LAI, LN, SA (1,9%)	0,4	1,4	1,9	1,9	1,9	1,2 (Only from PA)
Language	LN, PM (3,9%)	0,5	4,0	4,6	4,7	4,8	2,8 (Only from LN)
IPA	BING, PM (2,2%)	1,9	2,3	2,6	2,6	3,0	1,9 (Only from PM)
IPS	LAI, PA, LN, SA (5,4%)	1,0	5,2	5,6	6,0	6,2	3,0 (Only from LAI)

Information:
PA: Academic Reasoning, BA: Arabic language, BING: English, LAI: Islamic Religious Literacy, PM: Mathematic reasoning, LM: Literacy, SA: Science

As shown in Table 5, a regression analysis was conducted to evaluate the contribution of various predictors to academic performance (GPA) across different academic program groups. In the Religious Studies program group, significant predictors included Academic Reasoning, Islamic Religious Literacy, Mathematical Reasoning, and Science, with an average correlation of R = 0.093, accounting for 1.9% of the variance in GPA. In the Language program group, Mathematical Reasoning and Reading Literacy emerged as significant predictors, with an average R = 0.155, explaining 3.9% of the variance. For the Natural Sciences (IPA) group, English Language and Reading Literacy significantly contributed to GPA, with an average R = 0.127, explaining 2.2% of the variance. In contrast, in the Social Sciences (IPS) group, Academic Reasoning (TPA), Islamic Religious Literacy, Mathematical Reasoning, and Science were the dominant predictors, with an average R = 0.418, accounting for 5.4% of the variance. These findings indicate that the contribution of predictors-particularly academic reasoning and literacy-has a stronger impact in the IPS program group compared to the others.

The proportion of variance in GPA explained by the predictors reaches its maximum when those predictors demonstrate a significant correlation with GPA. Adding additional predictors does not necessarily enhance the explanatory power of the model. For instance, in the Religious Studies program group, the inclusion of four significant predictors – Academic Reasoning, Islamic Religious Literacy, Mathematical Reasoning, and Science- explains 1.9% of the GPA variance. However, when less significant predictors such as Arabic and English are included, the contribution decreases to only 0.4%. Reintroducing

significant predictors such as Academic Reasoning increases the explained variance to 1.3%. Using the stepwise method, the most influential predictors for GPA within each program group were identified. In the Religious Studies group, Academic Reasoning contributed the most (1.9%). For the Language group, Mathematical Reasoning was the primary predictor, explaining 2.8% of GPA variance. In the IPA group, Reading Literacy was the most significant predictor, contributing 1.9%. Meanwhile, in the IPS group, Islamic Religious Literacy contributed the most, explaining 3.0% of the variance.

The demographic data reveal that the gender distribution of prospective students at PTKIN is predominantly female (58.07%) compared to male (41.93%). This pattern is influenced by societal perceptions that consider religious higher education more suitable for women. PTKINs are often associated with the development of moral values, piety, and social responsibility-attributes that culturally align with traditional female roles (Nurdin, 2024; Horwitz, 2021). This gender trend also mirrors global patterns, where women are increasingly dominating higher education, particularly in the social sciences and humanities (Crawford & Silver, 2024; Putry, 2016). Therefore, the increased participation of women in PTKINs is driven not only by structural factors but also by cultural expectations that encourage women to pursue higher education as a pathway for social and economic mobility (Commission, 2021; Kusaeri, Ridho, & Wahyudi, 2024).

In addition, the dominance of students in the Religious Studies program – representing 56.78% of total participants-reflects the core identity of PTKINs as institutions centered on Islamic education (Akrim, Setiawan, Selamat, & Ginting, 2022; Abidin, 2021). The Ministry of Religious Affairs has positioned PTKINs as key institutions for the development of religious knowledge, particularly in areas such as Qur'anic Studies, Hadith, Islamic Law, and Islamic Education (Musyafak, Munawar, Khasanah, & Putri, 2021; Azzahra & Sutrisno, 2024). The strong interest in the Religious Studies track underscores PTKINs' relevance in meeting the socio-cultural and spiritual needs of Indonesian society, highlighting their strategic role in reinforcing Islamic education and contributing to national moral development (Abidin, 2021; Rohita & Maulida, 2020).

In terms of gender, the research data suggest that there is no significant difference in Academic Reasoning and Literacy scores between male and female students; however, female students tend to exhibit more consistent performance. This is evidenced by a lower standard deviation in Academic Reasoning scores among females (98.12) compared to males (102.70), indicating less variability. This consistency may be attributed to social norms that associate women with traits such as perseverance, attention to detail, and emotional regulation-characteristics that support sustained academic engagement and performance (Brosch & Dhamala, 2024; Tripon, 2022). On the other hand, the greater variation in male students' scores may reflect sociocultural expectations that encourage competitiveness and risk-taking, which can lead to fluctuating academic outcomes. Neurocognitive studies also highlight gender-related differences in information processing; for instance, women tend to excel in linguistic and emotional tasks, whereas men may show strengths in logic-based problem-solving, albeit with more performance variability (Atqiya & Diantoro, 2020). Additionally, gender-related differences in learning

styles and motivational patterns may further influence academic achievement, even though gender itself does not significantly affect Academic Reasoning or Literacy scores.

Furthermore, the predictive power of each test variable varies across academic program groups, indicating that the competencies required for academic success differ by discipline. This variation underscores the importance of tailoring academic readiness assessments to the specific demands of each field of study. Generally, Academic Reasoning serves as an indicator of foundational cognitive skills required for critical and analytical thinking, while Literacy Tests assess specialized competencies such as reading comprehension, mathematical reasoning, language proficiency, scientific understanding, and religious literacy. The integration of these two assessments offers a more holistic measure of students' academic readiness for higher education.

Although both test types contribute to predicting academic success, their overall contribution to GPA variance remains relatively limited. This suggests that academic performance is also influenced by other factors not captured by these assessments. A more nuanced analysis reveals that the significance and weight of specific predictors vary by academic program. In the Religious Studies program group, for example, four variables-Academic Reasoning, Islamic Religious Literacy, Mathematical Reasoning, and Science-show a combined average correlation (R) of 0.093 with GPA, explaining 1.9% of its variance. This modest contribution reflects the multifaceted nature of religious education, which involves not only cognitive abilities but also personal spirituality and contextual understanding of religious teachings (Mathew & Ibrahim, 2023). Pilotti, Mulhem, and El-Moussa (2022) similarly argue that academic success in religious studies is shaped by internal attributes such as moral character and spiritual depth, in addition to intellectual capacity. Furthermore, students' diverse educational backgrounds-such as those from pesantren or madrasah-play a critical role in shaping their academic preparedness and potential (Nojan, 2023).

Furthermore, Islamic Studies Literacy (ISL) emerges as a particularly noteworthy predictor within the Religious Studies program group. Unlike other subtests, ISL assesses the ability to comprehend, interpret, and apply Islamic teachings within an academic context. It tends to more accurately capture students' capacity to engage with religious texts such as the Qur'an and Hadith, rather than simply reflecting academic achievement in the conventional sense of GPA (Putri & Rohman, 2024). This explains why ISL shows a stronger contribution compared to other subtests in predicting GPA within this program.

In contrast, within the Language program group, two predictors-Mathematical Reasoning and Reading Literacy-demonstrate significant correlations with GPA, with an average correlation of 0.155, accounting for 3.9% of the GPA variance. Reading Literacy, as the primary predictor, reflects students' ability to interpret and analyze various types of texts, including literary and contextually rich academic materials. Mathematical Reasoning, while typically associated with quantitative domains, supports analytical thinking skills relevant to language studies, such as in quantitative linguistic analysis (Kaya, Yuksel, & Curle, 2023; Kusaeri & Wahyudi, 2024; Putra, Saregar, Diani, Misbah, & Widyawati, 2024). However, the modest predictive power of these two variables indicates

that additional factors-such as linguistic creativity and intercultural communication skills-also play a crucial role in academic success within this program (Moghaddam, 2024), which are not fully captured by the current subtests.

The Natural Sciences (IPA) program group presents a more nuanced contribution from predictors, with English Language proficiency and Reading Literacy emerging as significant variables, together explaining 2.2% of the GPA variance. English proficiency is particularly relevant, as a substantial portion of scientific literature in the natural sciences is published in English. Proficiency in this language allows students to access, comprehend, and critically engage with global scientific discourse (Kaya, Yuksel, & Curle, 2023). Reading Literacy further supports students' academic performance by enabling them to interpret complex scientific texts. However, the relatively low predictive power of these variables suggests that domain-specific practical skills-such as laboratory techniques and experimental problem-solving-may play a more dominant role in determining academic success within the IPA program.

Meanwhile, the Social Sciences (IPS) program group exhibits the highest predictive power, with four significant predictors – Islamic Religious Literacy, Academic Reasoning, Mathematical Reasoning, and Science – collectively explaining 5.4% of the GPA variance. In this context, Islamic Religious Literacy provides students with a normative and ethical framework for analyzing societal issues. A solid understanding of Islamic teachings enables students to incorporate religious perspectives into social and cultural analyses (Putri & Rohman, 2024). Academic Reasoning and Mathematical Reasoning further underscore the importance of critical thinking and data analysis skills, both of which are essential for evaluating social phenomena and constructing evidence-based arguments. Students in the IPS program are expected to collect, analyze, and interpret complex datasets to inform their academic inquiries (Fathimah, Tenri, Sasea, Marleni, & Suarjana, 2024). Mathematical Reasoning facilitates the comprehension of statistical relationships, while Academic Reasoning enhances the ability to engage with multifaceted social problems. Therefore, academic success in this program depends not only on foundational cognitive abilities but also on a deeper understanding of socio-cultural dynamics (Utku, 2021).

Conclusion

This study reveals several important findings regarding the relationship between academic reasoning, literacy, and academic achievement (GPA) among students at PTKINs. On one hand, the overall statistical relationship between academic reasoning and literacy with GPA is relatively weak. On the other hand, the results demonstrate that the contribution of each factor varies significantly across academic program groups. In the Religious Studies program group, academic reasoning, Islamic Studies Literacy, and scientific reasoning emerge as notable contributors. Within the Language program group, mathematical reasoning and reading literacy serve as the primary predictors of academic performance. In the Natural Sciences (IPA) group, English language proficiency and reading literacy exert a more substantial influence. Meanwhile, in the Social Sciences (IPS)

group, academic reasoning, Islamic Religious Literacy, mathematical reasoning, and science collectively serve as interconnected predictors of academic success. In conclusion, the findings underscore the importance of adopting a program-specific approach to enhancing academic achievement. Tailoring interventions based on the distinct cognitive and literacy demands of each academic discipline may lead to more effective educational strategies and student outcomes.

Acknowledgments

This study is part of a research project funded by the National Committee for the Admission of New Students to State Islamic Higher Education Institutions (Panitia Nasional Penerimaan Mahasiswa Baru Perguruan Tinggi Keagamaan Islam Negeri) under the 2024 Research Grant, as stipulated in the Decree of the Committee Chairperson No. 337/PMB-PTKIN/VII/2024, dated July 2, 2024.

Ethical Statement

This study was carried out following established ethical principles and guidelines to safeguard the rights, well-being, and safety of all participants. Prior to initiating the research, all required approvals and permissions were secured. The ethical practices implemented throughout the study were consistent with both institutional policies and international standards, thereby upholding the integrity and openness of the research process.

CRediT Author Statement

- **Author 1:** Conceptualization, Methodology, Investigation, Writing – Original draft preparation.
- **Author 2:** Conceptualization, Supervision, Writing – Reviewing and Editing.
- **Author 3:** Conceptualization, Methodology, Investigation, Formal analysis.

Conflict of Interest

The authors declare that there are no competing financial interests or personal relationships that could have influenced the work reported in this article.

Data Availability

The datasets generated and analyzed during the current study are available upon reasonable request.

References

Abidin, M. Z. (2021). Pengislaman Ilmu vs Pengilmuan Islam: Studi Model Penerapan Ilmu Integralistik Pada Perguruan Tinggi Keagamaan Islam di Indonesia. *ABHATS: Jurnal Islam Ulil Albab, 2*(2), 115–133. https://doi.org/10.20885/abhats.vol2.iss2.art3.

Akrim, A., Setiawan, H. R., Selamat, S., & Ginting, N. (2022). Transformation of Islamic Education Curriculum Development Policy in The National Education System. *Cypriot Journal of Educational Sciences, 17*(7), 2538–2552. https://doi.org/10.18844/cjes.v17i7.7685.

Allahyari, R., Abbasabady, M.M., Akhter, S. & Alibakhshi, G. (2023). EFL Teachers' Cognition of Social and Psychological Consequences of High-stake National Language Tests: Role of Teacher Training Workshops. *Language Testing in Asia, 13*(54): 1–16. https://doi.org/10.1186/s40468-023-00262-0.

Brosch, K., & Dhamala, E. (2024). Influences of Sex and Gender on The Associations Between Risk and Protective Factors, Brain, and Behavior. *Biology of Sex Differences, 15*(1), 1–17. https://doi.org/10.1186/s13293-024-00674-4.

Bruce, J., Mabizela, S. E., & Tshabalala, A. M. (2023). Selection Tests and Their Predictive Value in University Nursing Students ' Success in The First Year of Study. *BMC Medical Education, 23*(176), 1–8. https://doi.org/10.1186/s12909-023-04140-4.

Cheng, J., & Han, W. (2024). Handbook of Teaching Competency Development in Higher Education. *Guangdong: The International Centre for Higher Education Innovation under the auspices of UNESCO.* https://doi.org/10.1007/978-981-99-6273-0.

Crawford, K., & Silver, B. R. (2024). Exploring the Experiences of College Women in Fields with Disparities in Gender Representation. *Journal of Postsecondary Student Success, 3*(3), 25–48. https://doi.org/10.33009/fsop_jpss134226.

Fathimah, S., Tenri, A., Sasea, S. C., Marleni, M., & Suarjana, I. W. G. (2024). Comparative Study of Social Studies Curriculum in Scandinavian Countries in Developing Students ' Social Skills. *Journal of Education and Learning (EduLearn), 18*(4), 1197–1208. https://doi.org/10.11591/edulearn.v18i4.21711.

Fleuren, L. M., Klausch, T. L. T., Zwager, C. L., Schoonmade, L. J., Guo, T., Roggeveen, L. F., Swart, E. L., Girbes, A. R. J., Thoral, P., Ercole, A., Hoogendoorn, M., & Elbers, P. W. G. (2020). Machine Learning for The Prediction of Sepsis : A Systematic Review and Meta - Analysis of Diagnostic Test Accuracy. *Intensive Care Medicine, 46*(3), 383–400. https://doi.org/10.1007/s00134-019-05872-y.

Güloğlu-Demir, C., & Kaplan-Keleş, Ö. (2021). The Impact of High-Stakes Testing on The Teaching and Learning Processes of Mathematics. *Journal of Pedagogical Research, 5*(2), 119-137. http://dx.doi.org/10.33902/JPR.2021269677.

Horwitz, I. M. (2021). Religion and Academic Achievement: A Research Review Spanning Secondary School and Higher Education. *In Review of Religious Research* (Vol. 63, Issue 1). Springer US. https://doi.org/10.1007/s13644-020-00433-y.

Hou, H., Ma, L., Wang, D., & Qu, L. (2024). Untangling The Influence of Data Literacy and Knowledge Sharing Willingness on Academic Achievement of College Students in China : A Moderated Mediation Model. *Asia Pacific Education Review, 10*(5), 152-167. https://doi.org/10.1007/s12564-024-10010-5.

Jin, H., Yuyi, K., & Jihyun, P. (2024). The Validity of Heart Rate Variability (HRV) in Educational Research and a Synthesis of Recommendations. *Educational Psychology Review 36*(2), 514-523. https://doi.org/10.1007/s10648-024-09878-x.

Kaya, S., Yuksel, D., & Curle, S. (2023). The Effects of Language Learning and Math Mindsets on Academic Success in An Engineering Program. *Journal of Engineering Education, 112*(1), 90–107. https://doi.org/10.1002/jee.20499.

Kusaeri, K., & Aditomo, A. (2019). Pedagogical Beliefs About Critical Thinking Among Indonesian Mathematics Pre-Service Teachers. *International Journal of Instruction*, *12*(1), 573-590. https://doi.org/10.29333/iji.2019.12137a.

Kusaeri, K., & Wahyudi, N. (2024). The Relative Influence of Age, Gender, Regional Differences and Their Relationship with Students' Numeracy Levels on Madrasah Competency Assessment in Indonesia. *Jurnal Pendidikan Indonesia*, *13*(2), 288-297. https://doi.org/10.23887/jpiundiksha.v13i2.63570.

Kusaeri, K., Ridho, A., & Wahyudi, N. (2024). The use of Stocking-Lord and Haebara Methods in horizontal equating: A case of Indonesian Madrasah competence assessment. *JP3I (Jurnal Pengukuran Psikologi dan Pendidikan Indonesia)*, *13*(1), 57-79. http://dx.doi.org/10.15408/jp3i.v13i1.38300.

Marianti, S., Rufaida, A., Hasanah, N., & Nuryanti, S. (2023). Comparing Item-Total Correlation and Item Theta Correlation in Test Item Selection: A Simulation and Empirical Study. *Jurnal Penelitian dan Evaluasi Pendidikan, 27*(2), 133-145. https://doi.org/10.21831/pep.v27i2.61477.

Mathew, B. J., & Ibrahim, O. A. (2023). Effective Advising : How Does Academic Advising Influence Student Learning Outcomes in Higher Education Institutions In Oman ?. *Cogent Education*, *10*(1). https://doi.org/10.1080/2331186X.2023.2197663.

Muhid, A., Yusuf, A., Kusaeri, K., Novitasari, D. C. R., & Ridho, A. (2020). Determining Scholastic Aptitude Test as Predictors of Academic Achievement on Students of Islamic School in Indonesia. *The New Educational Review, 61*, 211–221. https://bit.ly/3ZJOafu.

Musyafak, N., Munawar, I., Khasanah, N. L., & Putri, F. A. (2021). Dissimilarity Implementasi Konsep Moderasi Beragama di Perguruan Tinggi Keagamaan Islam. *Prosiding Muktamar Pemikiran Dosen PMII*, *1*(1), 453-464. https://www.researchgate.net/publication/354554674.

Moghaddam, M. M. (2024). I Feel Self - Conscious About My Accent : International Students ' Communication Challenges in The Higher Education Context. *European Journal of Psychology of Education, 39*(4), 4617–4646. https://doi.org/10.1007/s10212-024-00896-5.

Nurdin, N. (2024). Analisis Pengarusutamaan Gender di Indonesia, 2000-2023: Pendekatan Institusionalisasi. *Jurnal Ilmiah Global Education, 5* (2), 948–958. https://doi.org/10.55681/jige.v5i2.2650.

Nojan, S. (2023). Racial-Religious Decoupling in the University : Investigating Religious Students ' Perceptions of Institutional Commitment to Diversity. *AERA Open, 9*(1), 1-18. https://doi.org/10.1177/23328584221121339.

Paris, J. H., Pressimone, C., & Sara, B. (2023). Predicting Success : An Examination of the Predictive Validity of a Measure of Motivational - Developmental Dimensions in College Admissions. *Research in Higher Education, 64*(8), 1191–1216. https://doi.org/10.1007/s11162-023-09743-w.

Permatasari, T. O., Prabandari, Y. S., & Kristina, T. N. (2016). Cognitive and Non-Cognitive Factor in Student Admission as Predictor of Academic Achievement. *Jurnal Penelitian dan Evaluasi Pendidikan, 20*(1), 80–89. https://doi.org/10.21831/pep.v20i1.5486.

Pilotti, M. A. E., Mulhem, H. A., & El-Moussa, O. J. (2022). An Exploratory Study of Students' Academic Entitlement in Arabic Culture and Religion Courses. *Religious Education, 117*(4), 296–312. https://doi.org/10.1080/00344087.2022.2097987.

Putra, F. G., Saregar, A., Diani, R., Misbah, M., & Widyawati, S. (2024). Enhancing Mathematical Reasoning : Role Of The Search, Solve, Create, and Share Learning. *Journal of Education and Learning (EduLearn), 18*(3). https://doi.org/10.11591/edulearn.v18i3.21399.

Putri, N. A., & Rohman, F. (2024). Evaluasi Dampak Program Literasi Al- Qur'an Terhadap Penguatan Karakter Religius Siswa Sekolah Menengah Pertama. *Jurnal EDUCATIO: Jurnal Pendidikan Indonesia, 10*(1), 766–778. http://dx.doi.org/10.29210/1202424549.

Rohita, R., & Maulida, R. (2020). Strategy and Evaluation of The Implementation of Moral Values at Islamic Universities. *NUANSA: Jurnal Penelitian Ilmu Sosial Dan Keagamaan Islam, 17*(1), 93–106. https://doi.org/10.19105/nuansa.v17i1.2993.

Stobart, G., & Eggen, T. (2012). High-Stakes Testing – Value, Fairness and Consequences. *Assessment in Education: Principles, Policy & Practice, 19*(1), 1-6. https://doi.org/10.1080/0969594X.2012.639191.

Tripon, C. (2022). Fostering Womens to Choose Stem Career by Using Emotional Intelligence As Key Element. *Journal of Educational Sciences, 45*(1), 51–68. https://doi.org/10.35923/jes.2022.1.04.

Utku, A. (2021). The Effect of Critical Reading Skill on Academic Success in Social Studies Ahmet. *Eurasian Journal of Educational Research*, *21*(93), 319–336. https://doi.org/10.14689/ejer.2021.93.15.

Villar, A., Robledo, C., & Andrade, V. De. (2024). Supervised Machine Learning Algorithms for Predicting Student Dropout and Academic Success : A Comparative Study. *Discover Artificial Intelligence, 29*(1), 64–77 . https://doi.org/10.1007/s44163-023-00079-z.

Yu, R., Li, Q., Fischer, C., & Xu, D. (2020). Towards Accurate and Fair Prediction of College Success : Evaluating Different Sources of Student Data. *In Proceedings of the 13th International Conference on Educational Data Mining (EDM 2020),* A. N. Rafferty, J. Whitehill, C. Romero, and V. Cavalli-Sforza, Eds. International Educational Data Mining Society, 292-301.