

BEYOND TEST SCORES: NON-COGNITIVE ADMISSION DOMAINS AS PREDICTORS OF FIRST-YEAR GPA IN PHILIPPINE BOARD PROGRAMS

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ABSTRACT: *This retrospective predictive-correlational study examined whether four pre-entry non-cognitive domains measured through a university admission test predicted first-semester academic performance among 1,562 first-year students enrolled in board programs at a Philippine state university. Collaboration, communication, professionalism, and resilience scores were matched with institutional grade point average (GPA) records and analyzed using multiple linear regression. The overall model was statistically significant, $F(4, 1557) = 9.795$, $p < .001$, but explained a small proportion of GPA variance ($R^2 = .025$; adjusted $R^2 = .022$). Collaboration ($B = -.035$, $p = .010$) and professionalism ($B = -.055$, $p < .001$) were significant unique predictors, whereas communication and resilience were not. Because the institutional grading scale assigns 1.00 to the highest performance, the negative coefficients indicate that higher collaboration and professionalism scores were associated with better, lower numerical GPAs. The findings support the diagnostic value of non-cognitive information but do not justify using such scores as stand-alone high-stakes admission criteria. Interpretation should remain cautious because the effect size was small and the original analysis reported that not all regression assumptions were satisfied.*

Keywords: admission assessment; board programs; collaboration; non-cognitive domains; professionalism; student performance

INTRODUCTION

College admission decisions commonly draw on high-school grades and standardized tests to estimate students' readiness for higher education. Admission measures can contribute useful predictive information [1], and surveys indicate that many institutions and applicants continue to regard entrance examinations as relevant components of selection [2]. Evidence from first-year college populations also shows that both cognitive and selected non-cognitive characteristics may contribute to academic performance and persistence [3]. The central methodological issue, therefore, is not whether admission tests contain predictive information, but whether each measured domain adds defensible, context-specific value beyond traditional academic indicators.

Non-cognitive domains refer broadly to attitudes, behaviors, social-emotional qualities, habits, and self-regulatory tendencies that support learning and performance. Their measurement requires particular care because constructs such as collaboration, professionalism, communication, and resilience are context dependent and may be influenced by self-presentation, cultural expectations, and the format of the assessment [4]. Longitudinal evidence nevertheless suggests that non-cognitive characteristics are meaningfully associated with educational outcomes, even when their effects are generally smaller than those of prior academic attainment [5].

The need for context-specific evidence is especially important in board programs. Students in engineering, architecture, science, and technology teacher education must meet demanding curricular requirements and later demonstrate competence in licensure examinations. Yet admission research in the Philippines has remained predominantly focused on cognitive scores or overall entrance-test performance. Limited evidence is available on whether pre-entry non-cognitive domains predict first-year GPA among students already selected into academically competitive board programs.

A further gap concerns interpretation. A statistically significant regression model may have limited practical

value when its explained variance is small, and associations between admission scores and GPA should not be interpreted as causal effects. Non-cognitive indicators may also operate through institutional conditions such as curriculum design, assessment practices, peer interaction, teaching strategies, and student support. Examining their unique predictive contribution is therefore useful primarily for diagnostic and developmental purposes rather than for labeling applicants as inherently likely or unlikely to succeed.

This study addressed these gaps by testing whether collaboration, communication, professionalism, and resilience scores from a university admission test predicted first-semester GPA among first-year students in board programs at a state university in Cagayan de Oro City, Philippines. It asked: (1) What are the levels of academic performance and the four non-cognitive domains? and (2) Do the four domains jointly and uniquely predict GPA? The analysis was intended to inform holistic admission review and targeted student development while recognizing the limits of prediction from a single institutional cohort.

Theoretical Framework

The study was guided by Tinto's model of institutional departure, which explains student continuation and success through the interaction of pre-entry attributes, goals, commitments, and subsequent academic and social integration [6]. Tinto's earlier synthesis likewise emphasized that persistence is shaped by students' experiences within the institution rather than by entry characteristics alone [7]. In the present study, admission-test non-cognitive scores were treated as pre-entry attributes, while first-semester GPA represented an early indicator of academic integration.

This perspective prevents an overly deterministic reading of admission data. Collaboration, communication, professionalism, and resilience may influence how students participate, seek help, organize effort, respond to setbacks, and meet course expectations, but their expression is also shaped by the learning environment. Consequently, a

predictive association does not imply that a domain is fixed or that it independently causes achievement.

The study also drew on the University of Chicago Consortium framework, which organizes non-cognitive factors into academic behaviors, perseverance, mindsets, learning strategies, and social skills [8]. These dimensions clarify plausible pathways linking the admission domains to academic outcomes: collaboration and communication support social learning; professionalism reflects reliability and responsible conduct; and resilience supports persistence under academic pressure.

The university admission instrument contains broader domains, but the available matched dataset included collaboration, communication, professionalism, and resilience. The framework therefore positioned these four domains as predictors and GPA as the outcome, while acknowledging that cognitive ability, prior achievement, socioeconomic conditions, program demands, and institutional support were not included in the fitted model.

Literature Review

Non-cognitive Skills and Academic Performance

Non-cognitive skills include motivation, perseverance, habits, attitudes, interpersonal capacities, and self-regulatory strategies that contribute to success in education and work [9]. Because the term covers heterogeneous constructs, valid interpretation requires explicit construct definitions and evidence that the assessment captures the intended domain rather than test-taking style or social desirability [10].

Students themselves recognize that non-cognitive capacities are important for managing academic demands and relationships [11]. Policy-oriented reviews likewise argue that such skills are malleable and can be strengthened through supportive learning environments [12]. Their educational relevance is therefore developmental as well as predictive.

College research has linked non-cognitive factors to retention and academic success [13]. However, these associations should be interpreted alongside prior achievement and contextual variables. A small but statistically detectable contribution can still be useful for identifying students who may benefit from collaboration, professional conduct, communication, or resilience-building initiatives, but it should not be treated as a substitute for cognitive and academic evidence.

Collaboration as a Non-cognitive Domain

Collaboration is the capacity to contribute responsibly to shared goals, coordinate tasks, value diverse contributions, and improve ideas through interaction [14]. In higher education, collaboration can expand access to peer explanations, feedback, and collective problem solving, but its academic value depends on task design, accountability, and equitable participation.

Research on learning spaces and science education found that collaboration was associated with educational outcomes and interest, with motivational and self-efficacy processes helping explain the relationship [15]. These findings support its inclusion as an admission domain while also indicating that collaboration is enacted within instructional settings rather than functioning solely as an individual trait.

Professionalism as a Non-cognitive Domain

Professionalism encompasses competence, ethical conduct, reliability, respect for others, accountability, and appropriate

responses to complex situations [16]. Studies in professional education show that learners' understanding of professionalism is influenced by disciplinary norms and institutional expectations [17].

In educational settings, professional conduct among faculty has been associated with teaching performance and student outcomes [18]. For students, professionalism may be reflected in punctuality, responsible completion of tasks, academic integrity, receptiveness to feedback, and respectful participation. These behaviors may support GPA because they shape the consistency with which students meet course requirements.

Academic professionalism also includes expertise, ethical responsibility, and alignment with organizational expectations [19]. As an admission-domain predictor, professionalism should therefore be understood as an early indicator of work habits and conduct rather than as a complete measure of professional identity.

Communication as a Non-cognitive Domain

Communication enables students to articulate ideas, listen empathically, resolve misunderstandings, and participate in academic interaction [20]. It is commonly grouped with collaboration, critical thinking, and creativity as a core twenty-first-century capability [21]. Broader communication literature similarly emphasizes its role in coordinating action and constructing shared understanding [22].

Students report that clear teacher communication supports understanding and academic success [23]. At the learner level, however, a general admission measure of communication may not directly predict GPA when course assessments emphasize individual written performance, when opportunities for oral interaction differ across programs, or when communication influences learning indirectly through help seeking and peer engagement.

Resilience as a Non-cognitive Domain

Resilience refers to adaptive functioning in the face of significant challenge and develops through interactions among personal, social, and environmental resources [24], [25]. It is not a fixed capacity or the absence of difficulty; rather, it reflects the ability to recover, adjust strategies, and continue goal-directed action.

International evidence associates resilience-related characteristics with academic achievement, particularly among students facing disadvantage [26]. College-focused models also link resilience and regulatory strategy use to achievement [27].

Grit and resilience have likewise been examined as contributors to successful academic performance [28]. Nevertheless, resilience may show a weak direct relationship with first-semester GPA when challenges are limited, scores are restricted among highly selected students, or its influence operates through attendance, persistence, coping, and support-seeking rather than grades alone.

School-level studies further report associations between non-cognitive or soft skills and academic achievement [29], [30]. Philippine technology-education research adds important contextual evidence. Branzuela, San Diego, and Namoco demonstrated through multiple regression that academic performance during flexible CAD instruction was shaped by a combination of learner, parental, teacher, and facility conditions, underscoring the multi-determined nature of achievement [31]. Benedictos and Namoco found

that a structured gamification intervention improved academic performance and information, media, and technology literacy, showing that engagement-related capacities can be strengthened through pedagogy rather than treated as fixed entry traits [32]. Namoco and Zaharudin further showed that pedagogical beliefs and institutional expectations influence teachers' assessment choices, indicating that the relationship between student characteristics and grades is partly conditioned by how learning is taught and assessed [33]. Finally, Capilitan and Namoco identified motivation, support, knowledge acquisition, preparation, and personal beliefs in the narratives of technology-education graduates who passed the LET [34]. Together, these studies support examining non-cognitive admission domains while cautioning that their predictive meaning depends on instructional, assessment, family, and institutional contexts.

MATERIALS AND METHODS

Research design. The study used a retrospective predictive-correlational design based on secondary institutional records. This design was appropriate because the predictors were measured during admission and were examined in relation to a later academic outcome. Multiple regression estimated the joint and unique associations of the four domains with GPA; it did not establish causal effects.

Setting and analytic sample. The analytic dataset comprised 1,562 first-year students enrolled during Academic Year 2023-2024 in board programs of the College of Engineering and Architecture and the College of Science and Technology Education at a state university in Cagayan de Oro City, Philippines. Records were included when admission-domain scores and first-semester GPA could be matched. The dataset therefore represented an institutional analytic census of eligible matched records rather than a probability sample of Philippine university students.

Data authorization and ethics. Institutional permission was obtained before the admission and GPA records were accessed. Students had provided consent for the responsible use of their admission-test and academic records in authorized university research. Names were replaced with codes, files were stored in a restricted database, and reporting used aggregate results in accordance with the Philippine Data Privacy Act. The final submission should identify the approving office or ethics committee and the approval or exemption number:

Predictor measurement. The University of Science and Technology Admission Test 2 (USTAT2) assesses cognitive and non-cognitive characteristics. The present analysis used four non-cognitive domains: collaboration, communication, professionalism, and resilience. The source manuscript reported item-reliability coefficients of .99, .96, .99, and .98, respectively. These values indicate high score consistency, although reliability alone does not establish construct validity or predictive fairness across programs and demographic groups.

Outcome Measure. Academic performance was operationalized as first-semester GPA. The university grading scale ranges from 1.00, the highest performance, to 5.00, with 3.00 as the lowest passing grade. Consequently, a negative regression coefficient indicates that a higher predictor score is associated with a lower numerical GPA

and therefore better academic performance.

Data preparation. Admission and academic records were cleaned, coded, and matched before analysis. The manuscript reports a final N of 1,562. Complete reporting should specify the number of initially eligible records, exclusions due to missing or unmatched data, and the strategy used to manage any remaining missing values. These details are necessary to assess potential selection bias in the analytic sample.

Statistical analysis. Descriptive statistics summarized GPA and the four predictors. Pearson correlations described bivariate relationships, and standard multiple linear regression tested whether the predictors jointly explained GPA and whether each domain made a unique contribution while holding the others constant. Statistical significance was evaluated at $p < .05$. Assumption checks included multicollinearity and other regression diagnostics. Because the source analysis reported that not all assumptions were met, the model was interpreted as exploratory; future validation should report residual diagnostics, tolerance and VIF, independence of errors, influential cases, and a sensitivity analysis using robust standard errors or an alternative estimator.

RESULTS AND DISCUSSION

Descriptive statistics analysis was done to examine the frequency, mean and standard deviation of the variables and to determine the level of variables; non-cognitive domains and academic performance. Moreover, Multiple Linear Regression was conducted to determine if the non-cognitive domains; Collaboration, Communication, Professionalism and Resilience altogether predict the academic performance of students in board programs. This was also conducted to determine the weights of the prediction. Below are the results and interpretations of the conducted analyses.

Descriptive statistics in Table 1 reveal that the participants scored above average in their Grade Point Average (GPA) for the first semester of the academic year 2023-2024, which indicates that the academic performance of all participants falls within the above-average range on the spectrum from excellent to failing Grade Point Average (GPA). This implies that the majority of the participants attend and engage in their classes, put necessary efforts to complete coursework and meet deadlines.

Table 1. Descriptive Statistics of Students' Academic Performance

	N	Min	Max	Mean	SD
GPA	1562	1.24	4.73	2.2533	.47696

Table 2 displays the correlations between academic performance and non-cognitive domains. As shown, there was a statistically significant negative correlation between academic performance and collaboration ($r = -.133$, $p < .001$), professionalism ($r = -.142$, $p < .001$), and resilience ($r = -.079$, $p < .002$). These findings imply that a higher grade point average (GPA) is associated with lower levels of non-cognitive domains. It is evident that participants executed their student' responsibilities by attending classes and preparing their coursework since majority of them attained an above average in their academic performance (refer to Table 1). Considering that participants are from board programs, they may tend to focus more of their time on individual tasks, studying independently, potentially leading

to less engagement in collaborative work. While participants may excel academically, their performance might not always align with their professional conduct. They may attend classes but stay passive. Also, participants exhibit resilience and remain optimistic even when their grades decrease. Moreover, Table 4 reveals a significant relationship between non-cognitive domains and the

General Point Average (GPA), $F(4, 1557) = 9.795, p < .001$. This implies that non-cognitive domains predicted academic performance. Specifically, among all non-cognitive domains, only collaboration and professionalism have impact in predicting the academic performance of the participants (see Table 3).

Table 2 Correlation Coefficients of Non-Cognitive Domains

		GPA	Collaboration	Communication	Professionalism	Resilience
GPA	Pearson Correlation	1	-.113**	-0.049	-0.142**	-0.079**
	Sig (2-Tailed)		<.001	0.051	<.001	0.002
	N	1562	1562	1562	1562	1562

Table 3. Coefficients of Non-Cognitive Domains and Academic Performance

Model	B	SE	Beta	T	P
Constant	2.253	.012		188.81	<.001
Collaboration	-.035	.014	-.073	-2.57	.010
Communication	.005	.013	.011	.388	.698
Professionalism	-.055	.014	-.116	-4.02	<.001
Resilience	-.003	.014	-.006	-.217	.828

Table 4. Model Summary

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	0.157 ^a	0.025	0.022	0.471	0.025	9.795	4	1557	<0.001

a. Predictors: (Constant), Collaboration, Communication, Professionalism, Resilience

Collaboration was found to predict the general point average of participants ($p < .010$), showing that as academic performance increases, collaboration tends to decrease. This implies that participants rely on their own capabilities, prioritizing their individual academic goals over collaborative work. Consequently, they may focus solely on attaining high marks without paying attention to developing their professional conduct. Participants might show inappropriate behaviour whenever in collaborative setting such as not contributing satisfactorily or doing all tasks by oneself rather than assigning it to others.

These findings are consistent with Tinto's Theory Model of Institutional Departure, where college is influence by academic integration often reflected through academic performance. Also, the non-cognitive model developed by the University of Chicago Consortium on School Research, where they described how non-cognitive factors affect academic performance [8]. Also, similar results from other study show that non-cognitive skills influence students' academic performance and that these skills are essential to enhance school performance and success [29]. An improvement in non-cognitive skills has a corresponding impact on student performance [30].

The findings of the present study have important implications for educational practice, admission testing policies. Although conducted in an educational context, the results extend to competency-based personnel selection particularly in roles where collaboration and professionalism are critical predictors of performance.

First, Higher Education Institutions (HEIs) may enhance

admission procedures by incorporating assessments of the non-cognitive domains in selection of prospect students. This approach can help identify students who are more likely to excel academically and thrive in professional settings. Second, academic councils may facilitate curriculum reviews and design programs that intentionally develop non-cognitive skills, fostering students' readiness for academic success. Third, foster holistic support through the Office of Student Affairs, in coordination with the Guidance Unit. These offices may promote holistic support services by addressing the needs of the students. They would initiate and provide counselling, peer tutorials, coaching, and mentoring to improve academic performance. The office would also provide support by monitoring students' progress and offering incentives through extracurricular activities that reinforce positive student behavior. By integrating non-cognitive assessments and support mechanisms, HEIs can ensure a more holistic and sustained approach to student success.

Despite the valuable insights obtained from the present study, several limitations should be recognized. The exclusive focus on selected board programs restricts the generalizability of the results to the broader population of college students. Additionally, the population were first-year students only. The results may differ if non-board programs and other year level were considered. Consequently, these limitations highlight the need for caution in generalizing the findings and emphasize the importance of future research to overcome these constraints

for a more comprehensive understanding.

Recommendations for future research includes consideration of the participants' programs and year level. Researchers may consider the whole population of college which may give a more comprehensive findings and interpretation. Also, a longitudinal study could comprehensively examine the impact of non-cognitive skills on academic performance, where researchers may consider a follow-up study after participants' graduation. By addressing these recommendations, future research can build on the current study's findings, offering a more comprehensive and accurate role of non-cognitive skills and academic performance of college students.

CONCLUSION

The four non-cognitive admission domains jointly predicted first-semester GPA among students in board programs, but the model explained only 2.5% of the variance. Collaboration and professionalism made statistically significant unique contributions, whereas communication and resilience did not. Given the reverse direction of the university grading scale, the negative coefficients for collaboration and professionalism represent associations with better academic performance. These findings support using non-cognitive information as one component of holistic student profiling and early support planning, not as a stand-alone basis for excluding applicants. Before high-stakes use, the instrument requires further evidence of construct validity, incremental predictive validity beyond cognitive scores and high-school GPA, measurement fairness, and replication across programs, cohorts, and institutions. Longitudinal studies should also examine whether the domains predict persistence, licensure outcomes, and professional readiness.

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