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| RESEARCH ARTICLE

Predictive Validity of Diagnostic Tests on Graduate Students' Academic and Comprehensive Examination Performance

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| ABSTRACT

Diagnostic Test scores were assessed for predictive validity on Academic Performance (GWA) and Comprehensive Examination Performance in 291 Northeastern College graduates. The quantitative correlational research approach used secondary data and the Pearson Product-Moment Correlation Coefficient (r) to examine whether early assessments predicted academic success. Diagnostic Test scores showed a weak positive correlation with Academic Performance (r= 0.162, p = 0.006). Higher diagnostic scores slightly improve GWA outcomes, but the test has little predictive potential for program academic performance. This indicates that academic achievement is complex and shaped by contextual and motivational factors beyond cognitive capacity, necessitating integrated evaluation methods. The Diagnostic Test did not predict the high-stakes Comprehensive Examination Performance (r= 0.040, p=0.492). Academic Performance (GWA) did not connect with Comprehensive Examination Performance (r= 0.28, p = 0.633). Initial diagnostic tests and overall academic grades did not predict performance on the comprehensive exam. High-stakes tests require a cumulative application of knowledge and skills that early assessments and traditional grades cannot provide. The study recommends a more comprehensive, multifaceted assessment strategy that uses targeted preparatory programs to address skill deficiencies identified through diagnostic testing, thereby improving the prediction of graduate program success.

| KEYWORDS

Predictive validity, Diagnostic test, Academic performance, Comprehensive examination, General Weighted Average (GWA), Correlational research, Graduate students.

| ARTICLE INFORMATION

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Introduction

In the contemporary educational landscape, assessment plays a pivotal role in shaping the academic trajectories of graduate students. Particularly at institutions such as Northeastern College, assessments serve as critical tools for student selection, curriculum development, and ongoing academic evaluation. These assessments are integral for both identifying candidates with the requisite knowledge and skills to succeed in graduate programs and for informing educators about curriculum effectiveness and areas requiring enhancement (Kuncel et al., 2001). In this regard, assessments not only facilitate alignment of educational offerings with student needs but also ensure that admissions processes are grounded in empirical evidence of student potential (Kuncel et al., 2001).

Diagnostic tests, designed to gauge students' prior knowledge and identify existing knowledge gaps, are typically implemented at the onset of graduate programs. These assessments can provide insights into students' preparedness for advanced study, enabling institutions to tailor educational resources accordingly. The formative data obtained from these tests can be instrumental in identifying students who may benefit from additional support, thereby aiding their academic development from the outset of their graduate journey (Grillo et al., 2019; DeOliveira et al., 2025). As such, diagnostic tests are a fundamental component of pedagogical strategies aimed at optimizing student outcomes and fostering a learning environment (Lee & Greene, 2007).

The need to establish the predictive validity of diagnostic tests becomes evident when considering their implications for future academic and professional success, such as GPA and performance on comprehensive examinations. Validating these assessments

against consequential long-term outcomes is essential for refining institutional testing and selection policies (Wilkinson et al., 2008; Meagher et al., 2006). The predictive validity of these diagnostic tools can enhance our understanding of their usefulness, allowing educational leaders to make informed decisions regarding admission standards and curricular adjustments (Ihlenfeldt & Rios, 2022). Moreover, by demonstrating that diagnostic assessments can accurately foretell academic success, institutions can implement evidence-based strategies that proactively support students in achieving their educational goals (Bethune & Johnson, 2013; Dombkowski et al., 2023).

Predictive validity becomes paramount in contexts where the stakes are considerably high, such as in graduate education, where students are often expected to meet rigorous performance benchmarks (Carr et al., 2014). The consequences of academic performance are particularly salient for prospective graduate students navigating complex, demanding academic environments. As such, understanding the correlation between diagnostic test scores and subsequent comprehensive examination results becomes a crucial inquiry within educational research (Isbej et al., 2021). Exploring this relationship could yield valuable insights into the effectiveness of diagnostic tests as predictors of academic success and for identifying students at risk of underachievement (Menzies & Lane, 2011; Dang et al., 2018).

Through rigorous examination, it is essential to develop a clear research agenda to address gaps in our understanding of the predictive validity of diagnostic tests. Specific research questions will guide this inquiry, focusing on the correlation between diagnostic test scores and both General Weighted Average (GWA) and comprehensive examination performance, as well as the relationship between achievement test scores and comprehensive examination outcomes (Farrokhi-Khajeh-Pasha et al., 2012). By establishing meaningful connections between these variables, researchers can contribute to the ongoing discourse surrounding graduate student assessment strategies, ultimately aiming to enhance educational practices and improve student outcomes at institutions such as Northeastern College (Lievens et al., 2009; Patterson et al., 2015). Thus, this study aims to assess the predictive validity of Diagnostic Test and Achievement Test scores for subsequent Academic Performance and Comprehensive Examination Performance among graduate students.

Research Methodology

This section details the methods and procedures employed to investigate the predictive validity of diagnostic tests on the academic and comprehensive examination performance of graduate students.

Research Design

The study employed a Quantitative-Correlational Research Design. This design is appropriate because the research aims to determine the degree and nature of the relationship between a set of predictor variables (diagnostic test results) and a set of criterion variables (academic and comprehensive examination performance). Specifically, it seeks to establish predictive validity by assessing the accuracy with which diagnostic test scores predict future success in academic coursework and on the comprehensive examination.

Locale, Participants, and Sampling Technique

The research was conducted at a private higher education institution located in Santiago City, Philippines. This institution serves as the primary source of all necessary data, including student academic records, diagnostic test results, and comprehensive examination scores.

The participants of this study were the entire population of graduate school students enrolled in the Master of Arts in Education (MAEd), Master of Public Administration (MPA), Master of Business Administration (MBA), Doctor of Philosophy in Education (PhD in Education), and Doctor of Education (EdD) programs.

The Total Enumeration Sampling Technique was used, meaning that all students in the specified graduate programs who had completed the diagnostic test, academic coursework, and comprehensive examination within a defined period were included in the study. This technique ensures that the sample is representative of the population, thereby eliminating sampling error and providing the most accurate representation of the predictive relationship within the target institution.

Research Instruments

The data for this study were obtained from secondary sources, specifically the official records of Northeastern College. No primary data were collected (e.g., via surveys or interviews). The instruments, or data points, used were:

- Diagnostic Test Results: Scores obtained by the graduate students on the standardized diagnostic test administered upon entry or at a specific point in their program. These scores serve as the predictor variable.
- Academic Performance: The students' overall academic standing, typically measured by the General Weighted Average (GWA) or equivalent cumulative grade from their graduate coursework. This serves as a criterion variable.
- Comprehensive Examination Results: The final scores obtained by the students on their required comprehensive examination. This serves as the second criterion variable.

Data Collection Process

The data collection followed a systematic, four-step process:

1. Formal Request and Approval: A formal letter requesting permission to utilize the secondary data (diagnostic test results, academic performance, and comprehensive examination results) was submitted to the Dean of the Graduate School and/or the appropriate administrative head of Northeastern College.

2. Data Identification and Extraction: Upon approval, the researcher, in coordination with authorized college personnel (e.g., Registrar or Research Office staff), identified the relevant official records for the target graduate students. The necessary numerical data were then extracted and anonymized.
3. Data Collation and Matching: The three sets of scores (Diagnostic Test, GWA, and Comprehensive Exam) were carefully matched for each student while ensuring their identities remained confidential. This step was crucial to create a complete and accurate dataset for statistical analysis.
4. Data Encoding and Cleaning: The collated numerical data were encoded into a statistical software package and subjected to a thorough cleaning process to check for errors, outliers, or missing values before proceeding to the analysis phase.

Statistical Treatment of Data and Data Analysis

To address the research objective of assessing predictive validity, the data were subjected to Pearson product-moment correlation analysis.

The Pearson was computed to assess the strength and direction of the linear relationship between:

1. Diagnostic Test Results and Academic Performance (GWA).
2. Diagnostic Test Results and Comprehensive Examination Results.

The resulting correlation coefficient was used to assess the magnitude of predictive validity. A statistically significant, strong positive correlation would indicate that the diagnostic test is a valid predictor of performance on the respective criterion variables. The significance of the correlation coefficients will be tested using the appropriate test to determine the probability of the observed relationship occurring by chance.

Range of Correlation Coefficient Values	Level of Correlation
1.00 to-0.80	Very Strong Negative
-0.79 to -0.60	Strong Negative
-0.59 to -0.40	Moderate Negative
-0.39 to -0.20	Weak Negative
-0.19 to -0.01	Very Weak Negative
0.00 to 0.19	Very Weak Positive
0.20 to 0.39	Weak Positive
0.40 to 0.59	Moderate Positive
0.60 to 0.79	Strong Positive
0.80 to 1.00	Very Strong Positive

Ethical Considerations

The study adhered to strict ethical considerations to protect the privacy and rights of the participants:

- Anonymity and Confidentiality: All collected data were anonymized and kept strictly confidential. No personally identifiable information (names, student numbers) was recorded or reported.
- Institutional Consent: Informed consent was secured from the administration of Northeastern College prior to accessing the secondary data.
- Data Use: The data were used exclusively for the purpose of this academic research, as outlined in the formal request.
- Data Security: The digital dataset was stored securely and was accessible only to the primary researcher.

Result, Discussion, and Implication

Table 1. Correlation Matrix

			1	2	3
1.	Diagnostic Test	Pearson's r	—		
		df	—		
		p-value	—		
2.	Comprehensive Examination Performance	Pearson's r	0.040	—	
		df	289	—	
		p-value	0.492	—	
3.	Academic Performance	Pearson's r	0.162**	0.028	—
		df	289	289	—

Table 1. Correlation Matrix

		1	2	3
	p-value	0.006	0.633	—

*Note. * p < .05, ** p < .01, *** p < .001*

Results

Correlation analysis of data from a sample of 291 graduate students indicated a statistically significant but weak positive correlation between Diagnostic Test scores and Academic Performance outcomes. Specifically, the correlation coefficient was found to be (r = 0.162) (p = 0.006). This finding suggests that while there is a discernible relationship between Diagnostic Test scores and Academic Performance, the correlation is weak, indicating a minimal association. It follows that an increase in Diagnostic Test scores is only marginally related to improvements in academic outcomes throughout the graduate program.

In contrast, the results for Comprehensive Examination Performance were markedly different. The correlation coefficient for the relationship between Diagnostic Test scores and Comprehensive Examination Performance was (r = 0.040) (p = 0.492), which did not achieve statistical significance. Furthermore, the correlation analysis indicated that Academic Performance itself did not show a significant relationship with Comprehensive Examination Performance, with a correlation coefficient of (r = 0.028) (p = 0.633). These findings suggest an apparent disconnect between the variables measured: neither the Diagnostic Test nor cumulative Academic Performance was a predictive indicator of success on the subsequent Comprehensive Examination.

Discussion

The analysis of a sample of 291 graduate students indicates that, although the Diagnostic Test showed a statistically significant positive correlation with Academic Performance (r=0.162, p=0.006), the overall effect remains weak. This suggests that the Diagnostic Test may provide limited predictive insight into academic success in the graduate program. This finding aligns with Richardson et al. (2012), who emphasize that individual differences in cognitive abilities and other psychological factors can serve as distant indicators of academic achievement, thereby reinforcing the need for diverse and integrated assessment approaches to optimize predictions of students' success.

Moreover, the weak association reflects the complexity of predicting educational outcomes, where academic performance can also be influenced by contextual and motivational factors that a single diagnostic assessment might fail to capture comprehensively (Richardson et al., 2012). Existing research on academic performance has similarly demonstrated weak predictive validity for standardized tests, contingent on various moderating variables, as shown by Kuncel et al. (2001) and Kerridge & Gunderman (2016), highlighting that reliance on single metrics can lead to misinterpretation of a student's capabilities.

In terms of the Comprehensive Examination Performance, the Diagnostic Test showed no statistically significant predictive validity (r=0.040, p=0.492). This finding is consistent with the literature, indicating that high-stakes examinations often reflect a cumulative synthesis of knowledge and skills acquired over time, making early assessments, such as Diagnostic Tests, insufficient for gauging readiness for such pivotal evaluations (Sandow et al., 2002; Kim, 2025). Additionally, the lack of a significant relationship between Academic Performance and Comprehensive Examination Performance (r=0.028, p=0.633) further supports the argument that traditional academic grades may not reliably predict success in comprehensive testing. Various studies have elucidated that alternative predictors often yield better predictive validity for comprehensive exams by incorporating nuanced aspects of student readiness and skills that standard grades may overlook (Wilkinson et al., 2008; Delavari et al., 2018).

Ultimately, the results indicate a broader systemic issue in the predictive validity of assessments within academic settings. Despite efforts to use diagnostic tests to streamline student success pathways, the evidence suggests that neither initial diagnostic evaluations nor cumulative academic achievement is an effective standalone predictor of success on high-stakes comprehensive examinations. Consequently, a more holistic approach that encompasses a multi-faceted range of evaluative measures may be necessary to enhance predictive accuracy in academic contexts, modeling frameworks that integrate diverse indicators of student performance over time (Lee & Greene, 2007; , Hunter & Hunter, 1984).

Implications for Practice

These results underscore the need to refine diagnostic assessment practices and to align them more closely with the expectations and requirements for successful comprehensive examination performance. Institutions should consider offering tailored preparatory programs that focus on specific skills and knowledge areas identified as weak through diagnostic testing, rather than relying solely on test scores as indicators of future performance.

In summary, the results indicate a limited predictive validity of the Diagnostic Test concerning both Academic and Comprehensive Examination Performance. Future research should focus on developing a more comprehensive understanding of the factors influencing graduate student success and exploring alternative assessment methods or combined metrics that better correlate with comprehensive examination outcomes.

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