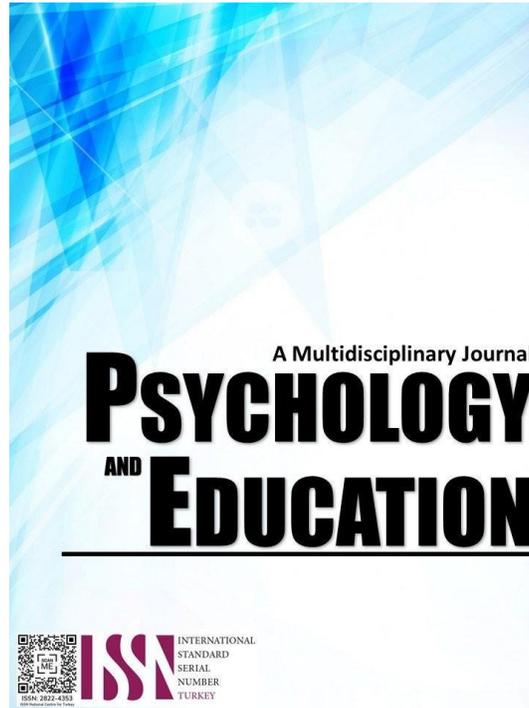


SENIOR HIGH SCHOOL READINESS: ANALYZING SUBJECT PERFORMANCE, COGNITIVE ABILITY, AND STRAND PREFERENCE AMONG GRADE 10 STUDENTS



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Senior High School Readiness: Analyzing Subject Performance, Cognitive Ability, and Strand Preference among Grade 10 Students

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Abstract

This study examines the performance of Grade 10 students in the Readiness Test for Senior High across four key domains: English, Mathematics, Science, and Inductive Reasoning. Using a sample of 89 students selected through simple random sampling, descriptive and inferential statistical methods were employed. Results revealed the highest performance in Science ($M = 284$) and Inductive Reasoning ($M = 268$), while Mathematics showed the lowest mean score ($M = 216$). The distribution of scores indicated variability in English ($SD = 42.9$) and greater consistency in Inductive Reasoning ($SD = 35.8$). Normality tests indicated deviations in English and Inductive Reasoning scores, prompting the use of non-parametric tests for correlation analysis. Spearman's Rank-Order Correlation revealed significant positive relationships between Inductive Reasoning and all subject scores, with the strongest correlation observed in Science ($\rho = 0.518$). Kruskal-Wallis tests indicated significant differences in Inductive Reasoning scores across Senior High strands, particularly between ABM and STEM students ($p = 0.009$). A Chi-square test of independence further revealed a significant association between students' Composite Score Quality Index and their preferred Senior High strand ($\chi^2 = 14.58, p = 0.006$), indicating that students' academic readiness influences their strand preferences. Gender did not significantly influence performance across subjects. These findings underscore the importance of cognitive abilities, particularly inductive reasoning, in students' readiness for Senior High, suggesting targeted interventions to enhance preparedness for specific academic tracks.

Keywords: *chi-square test, cognitive ability, gender differences, inductive reasoning, Kruskal-Wallis test, performance, readiness test*

Introduction

The transition from junior high to senior high school is a critical academic milestone, as students are required to choose a specific strand or track that aligns with their skills, interests, and career aspirations. In the Philippines, the Senior High School (SHS) program under the K-12 curriculum offers four major tracks: Science, Technology, Engineering, and Mathematics (STEM); Accountancy, Business, and Management (ABM); Humanities and Social Sciences (HUMSS); and Technical-Vocational-Livelihood (TVL) (Department of Education [DepEd], 2013). While students are given the freedom to choose their preferred track, their readiness for the academic demands of each strand remains a critical factor in ensuring success in senior high school and beyond (Ocampo & Ocampo, 2020).

Academic readiness is typically assessed through standardized tests that evaluate students' competencies in core subject areas such as English, Mathematics, and Science, as well as their cognitive ability in areas like inductive reasoning. Standardized assessments provide objective measures of students' strengths and weaknesses, offering valuable insights into their preparedness for senior high school (Center for Educational Measurement [CEM], 2021). Prior research has indicated that students who demonstrate strong cognitive skills, particularly in problem-solving and reasoning, tend to perform better in STEM-related fields, whereas those with high linguistic proficiency often excel in HUMSS (Reyes et al., 2019). However, limited studies have explored the direct relationship between students' performance in readiness assessments and their actual strand preferences.

Additionally, gender differences in academic performance and career preferences remain an essential aspect of educational research. Studies have suggested that males and females tend to exhibit different strengths in cognitive and subject-specific competencies, which may influence their strand selection in senior high school (Garcia & Cruz, 2020). Understanding these patterns can help educators and policymakers develop targeted interventions to guide students toward academically and professionally suitable tracks.

This study aims to examine the relationship between academic readiness, cognitive ability, and students' preferred senior high school strands. Specifically, it investigates students' performance in English, Mathematics, Science, and Inductive Reasoning and analyzes how these factors correlate with their strand preferences. Moreover, the study explores gender-based variations in readiness and strand selection. The findings of this research can provide valuable insights for curriculum developers, guidance counselors, and educational policymakers in refining career guidance programs and improving senior high school placement strategies.

Research has shown that students' academic performance often correlates with their choice of Senior High strand, with strong performance in subjects like mathematics and science typically leading students to select STEM, while those excelling in social sciences and languages gravitate toward HUMSS. Studies by Swartz and Gray (2018) and Zhang and Siti (2021) suggest that students' perceived strengths in specific subjects influence their choice of educational track, which in turn impacts their academic outcomes. Additionally, Lam et al. (2020) found that students' subject choices reflect their abilities, and students who align their strengths with their chosen strand tend to perform better. This connection highlights the importance of aligning students' academic capabilities with their

educational tracks to optimize their performance, as discussed by Darmawan et al. (2022), who emphasize the need for early guidance in helping students select strands that align with their strengths for improved academic success.

Research Objectives

This study aimed to evaluate the academic readiness of Grade 10 students by analyzing their performance in the Readiness Test by CEM across English, Mathematics, Science, and Inductive Reasoning, and exploring how these performance indicators relate to their preferred Senior High School strand and gender. Specifically, it sought to:

1. Assess the performance of Grade 10 students in the Readiness Test across the four components.
2. Examine the relationship between students' Inductive Reasoning scores and their performance in the subject matter tests.
3. Analyze the distribution of students across Quality Index categories (Low, Average, High) in each test.
4. Determine whether significant differences exist in Readiness Test performance across different Senior High School strands (STEM, ABM, HUMSS, TVL).
5. Analyze gender differences in student performance across the tested areas.
6. Examine the relationship between students' composite index scores in the four components and their chosen Senior High School strand.

Literature Review

The concept of academic readiness has been widely explored in educational research, particularly in relation to student performance and career alignment. Studies have shown that standardized assessments serve as strong predictors of academic success and can guide students in selecting appropriate educational pathways (Dizon, 2016). According to Torres and Peralta (2018), students who demonstrate high proficiency in Mathematics and Science tend to prefer STEM-related fields, while those with strong verbal reasoning skills gravitate toward HUMSS. This suggests that subject-specific competencies play a significant role in shaping students' academic choices.

A study by Mendoza and Reyes (2019) found that students who exhibit high problem-solving skills in cognitive tests often perform better in Mathematics and Science subjects, reinforcing the importance of analytical reasoning in STEM education. Similarly, research conducted by Lopez (2020) highlighted that students who scored high in language proficiency assessments were more inclined to pursue careers in humanities and social sciences. These findings suggest that academic readiness assessments can be a valuable tool for guiding students toward strands that match their abilities and interests.

Cognitive ability, particularly inductive reasoning, has been linked to students' performance across various academic disciplines. According to Bautista and Santos (2017), students with strong inductive reasoning skills tend to excel in analytical subjects, making them better suited for STEM-related courses. This is supported by the research of Villanueva (2021), which found a positive correlation between cognitive ability and problem-solving skills, particularly in subjects that require logical thinking and quantitative reasoning.

In contrast, studies have also shown that cognitive abilities are distributed across different academic domains. Martinez and Ramos (2015) emphasized that while logical reasoning skills are crucial for STEM, linguistic and critical thinking abilities are equally important in humanities and business-related fields. Understanding these cognitive patterns can help educators provide more tailored academic support to students based on their strengths and weaknesses.

Gender differences in academic performance and career preferences have been widely studied in the context of educational psychology. Research by De Leon and Garcia (2016) revealed that male students tend to perform better in Mathematics and Science, leading to a higher representation of males in STEM fields. Conversely, female students often exhibit stronger language skills and social awareness, making them more inclined to pursue HUMSS and ABM strands.

Further studies by Cruz et al. (2019) examined the role of gender stereotypes in academic choices, concluding that societal expectations influence students' preferences for certain strands. Their research found that despite having the cognitive ability to excel in STEM, many female students opted for non-STEM tracks due to perceived gender norms. Addressing these disparities through targeted career guidance and mentorship programs has been recommended as a strategy to promote gender inclusivity in academic pathways (Delos Reyes, 2020).

Methodology

Research Design

This study employs a descriptive-correlational research design to examine the relationship between Grade 10 students' performance in the Readiness Test—covering English, Mathematics, Science, and Inductive Reasoning—and their preferred Senior High School strand. The descriptive aspect summarizes student performance, while the correlational component explores associations between academic results, cognitive ability, gender, and strand selection. Additionally, the study investigates whether students' test outcomes align with their chosen strand, providing insight into how academic strengths relate to track preference. A Chi-square test of independence was used to analyze the association between composite scores (categorized as Low, Average, or High) and strand choices.

Respondents

The sample consisted of 89 Grade 10 students selected from a population of 114 examinees who took the Readiness Test. The sample size was computed using the Raosoft sample size calculator with a 5% margin of error and 95% confidence level. To ensure randomness and reduce selection bias, a wheel of names was used to draw participants. This simple random sampling technique ensured that the sample was representative of the student population.

Instrument

The study utilized the Readiness Test for Senior High School developed by the Center for Educational Measurement (CEM). This standardized test covers four domains: English, Mathematics, Science, and Inductive Reasoning. Results included Scaled Scores, Percentile Ranks, Stanine scores, and a Quality Index (Low, Average, High). The instrument's reliability is well-established by the CEM, which ensures rigorous test development and validation procedures.

Procedure

The data collection process began with securing approval from the administration of Southern Baptist College to access and use the results of the CEM Readiness Test for research purposes. Once permission was granted, the researchers obtained the test results of all 114 Grade 10 students who had taken the assessment. To select participants for the study, a simple random sampling technique was employed using a digital roulette tool (wheel of names), resulting in a final sample of 89 students. The collected data included students' scores in English, Mathematics, Science, and Inductive Reasoning, along with their gender and preferred Senior High School strand. To ensure confidentiality, all identifying information was removed, and the data were anonymized before analysis. The dataset was then encoded and organized for statistical analysis using Jamovi version 2.6.23.

Data Analysis

The collected data were analyzed using Jamovi version 2.6.23. To determine the appropriate statistical tests, the Shapiro-Wilk test was first conducted to assess the normality of the data. When the data violated normality assumptions, non-parametric tests were used to ensure accurate analysis. Descriptive statistics, including means, standard deviations, and frequency distributions, were employed to summarize student performance across English, Mathematics, Science, and Inductive Reasoning. To examine the relationship between students' Inductive Reasoning scores and their performance in the subject matter tests, Spearman's Rank Correlation was used; Pearson's correlation coefficient was applied when normality assumptions were met. The Chi-square test of independence was conducted to assess significant differences in Readiness Test performance across gender and preferred Senior High School strands, with particular emphasis on analyzing the association between composite index scores and strand choices. Additionally, the Kruskal-Wallis test was used to compare test scores among different strands due to the non-normal distribution of the data.

Ethical Considerations

This study adhered strictly to ethical research principles. Institutional permission was secured from Southern Baptist College, and approval was obtained to use the CEM Readiness Test data for academic purposes. To maintain confidentiality, all student information was anonymized. Access to the dataset was limited to the researchers, and findings were used solely for scholarly analysis. Ethical clearance followed institutional protocols to ensure that data privacy, transparency, and participant protection were upheld throughout the research process.

Results and Discussion

This section presents the statistical analyses conducted to examine students' performance in the Readiness Test across four key domains: English, Mathematics, Science, and Inductive Reasoning. The study utilized a sample of 89 Grade 10 students, selected through simple random sampling based on a 5% margin of error and a 95% confidence interval, as determined using the Raosoft sample size calculator. Descriptive statistics were computed to summarize the distribution of scores, while inferential statistical tests were applied to determine relationships and significant differences across various student characteristics, such as strand preference and gender.

Table 1 shows the descriptive statistics for the Readiness Test scores in English, Mathematics, Science, and Inductive Reasoning provide insights into students' academic preparedness for Senior High School. The mean scores indicate that students performed best in Science ($M = 284$, $SD = 40.0$) and Inductive Reasoning ($M = 268$, $SD = 35.8$), followed by English ($M = 261$, $SD = 42.9$) and Mathematics ($M = 216$, $SD = 39.0$). The highest median score was also observed in Science (280), suggesting that students generally performed well in this subject. Meanwhile, the lowest mean and median scores were in Mathematics, indicating potential difficulties in this subject area. The standard deviations suggest variations in student performance, with the highest variability observed in English ($SD = 42.9$) and the lowest in Inductive Reasoning ($SD = 35.8$). This implies that students' scores in English were more spread out compared to their scores in Inductive Reasoning, where students performed more consistently.

In terms of data distribution, the skewness values indicate that the English scores (1.24) were positively skewed, meaning that a larger number of students scored below the mean. Mathematics scores (-0.586) were negatively skewed, suggesting that more students

performed above the mean. Meanwhile, Science (0.138) and Inductive Reasoning (0.515) were approximately symmetric, indicating a relatively normal distribution of scores. The kurtosis values reveal that English scores (1.89) were leptokurtic, meaning they had a higher peak with more students scoring close to the mean. In contrast, Science (-0.0529) and Inductive Reasoning (-0.153) were slightly platykurtic, indicating a flatter distribution with scores more evenly spread out.

Table 1. *Descriptive Statistics of Readiness Test Scores in English, Mathematics, Science, and Inductive Reasoning*

	<i>English Scaled Score</i>	<i>Mathematics Scaled Score</i>	<i>Science Scaled Score</i>	<i>Inductive Reasoning</i>
N	89	89	89	89
Missing	0	0	0	0
Mean	261	216	284	268
Median	253	217	280	262
Standard Deviation	42.9	39.0	40.0	35.8
Minimum	174	100	195	194
Maximum	412	306	398	356
Skewness	1.24	-0.586	0.138	0.515
Std. Error Skewness	0.255	0.255	0.255	0.255
Kurtosis	1.89	0.972	-0.0529	-0.153
Std. Error Kurtosis	0.506	0.506	0.506	0.506

These results suggest that Grade 10 students generally excel in Science and Inductive Reasoning, while Mathematics appears to be their weakest area. The variability in English scores indicates that some students performed exceptionally well while others struggled. The slight positive skewness in Inductive Reasoning suggests that while most students performed around the mean, a few had notably high scores.

Findings from previous studies support the importance of readiness assessments in predicting academic performance. According to Conley (2014), cognitive skills such as inductive reasoning and subject-specific competencies serve as strong indicators of students' preparedness for senior high school and higher education. Similarly, Camara and Echternacht (2020) emphasized that standardized test scores, particularly in mathematics and science, are significant predictors of success in STEM-related fields. Furthermore, Sawyer (2013) highlighted the role of diagnostic assessments in identifying academic strengths and weaknesses, aiding in targeted interventions to improve student outcomes.

Table 2. *Test of Normality for Students' Readiness Test Scores*

	<i>English Scaled Score</i>	<i>Mathematics Scaled Score</i>	<i>Science Scaled Score</i>	<i>Inductive Reasoning</i>
N	89	89	89	89
Missing	0	0	0	0
Shapiro-Wilk W	0.909	0.973	0.990	0.968
Shapiro-Wilk p	<.001	0.059	0.739	0.028

Significant at the 5% level ($p < 0.05$), indicating a violation of normality assumption.

Table 2 presents the Shapiro-Wilk test results, which assess the normality of students' scores in English, Mathematics, Science, and Inductive Reasoning. The findings indicate that the English Scaled Score ($p < .001$) and Inductive Reasoning ($p = .028$) significantly deviate from a normal distribution, whereas Mathematics ($p = .059$) and Science ($p = .739$) do not violate normality assumptions. Since a p-value below 0.05 suggests non-normality, the results confirm that English and Inductive Reasoning scores are not normally distributed.

Given that at least one variable in each correlation pair fails the normality test, the use of a non-parametric correlation test is necessary. Spearman's Rank-Order Correlation is selected as the appropriate method to analyze the relationship between Inductive Reasoning and subject performance (English, Mathematics, Science) since it does not assume normality and is more robust for non-normally distributed data.

Table 3 presents the Spearman's rank-order correlation coefficients between Inductive Reasoning and the subject matter test scores in English, Mathematics, and Science. The results indicate a significant positive correlation between Inductive Reasoning and all three subject areas, with the strongest association observed between Inductive Reasoning and Science ($\rho = 0.518$, $p < .001$), followed by Mathematics ($\rho = 0.429$, $p < .001$) and English ($\rho = 0.251$, $p < .05$). These findings suggest that students with higher Inductive Reasoning scores tend to perform better in these subject areas, particularly in Science and Mathematics.

The strong correlation between Inductive Reasoning and Science performance aligns with prior research emphasizing the role of logical reasoning in scientific understanding and problem-solving. According to Bautista and Santos (2017), inductive reasoning is crucial in scientific inquiry as it enables students to recognize patterns, formulate hypotheses, and draw generalizable conclusions from observations. Similarly, Villanueva (2021) found that cognitive skills such as inductive and deductive reasoning significantly predict students' success in Science subjects, reinforcing the importance of critical thinking in scientific learning.

Table 3. Spearman's Rank-Order Correlation Between Inductive Reasoning and Subject Matter Test Scores

		Inductive Reasoning	English Scaled Score	Mathematics Scaled Score	Science Scaled Score
Inductive Reasoning Missing	Spearman's rho	—			
	df	—			
	Shapiro-Wilk W	p-value	—		
English Scaled Score	Spearman's rho	0.251*	—		
	df	87	—		
	p-value	0.018	—		
Mathematics Scaled Score	Spearman's rho	0.429***	0.378***	—	
	df	87	87	—	
	p-value	<.001	<.001	—	
Science Scaled Score	Spearman's rho	0.518***	0.635***	0.430***	—
	df	87	87	87	—
	p-value	<.001	<.001	<.001	—

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

Mathematics also demonstrated a substantial correlation with Inductive Reasoning, supporting previous studies that highlight the role of reasoning skills in mathematical problem-solving. Research by Mendoza and Reyes (2019) indicated that students with higher cognitive ability tend to excel in numerical and logical tasks, which are fundamental to Mathematics. This finding is further supported by Torres and Peralta (2018), who found that students with strong reasoning abilities exhibit better performance in algebraic manipulation and quantitative reasoning tasks, which are key components of Mathematics assessments.

In contrast, the correlation between Inductive Reasoning and English, while statistically significant, was weaker than the correlations observed for Mathematics and Science. This result is consistent with prior literature suggesting that language proficiency relies on a broader set of cognitive skills, including memory, comprehension, and linguistic exposure, rather than solely on logical reasoning (Garcia & Cruz, 2020). While reasoning skills contribute to language comprehension and critical reading, the relatively lower correlation suggests that other factors, such as verbal intelligence and reading habits, may play a more dominant role in English performance.

Overall, these findings validate the significance of Inductive Reasoning in shaping students' academic performance across different subject domains, particularly in Science and Mathematics. The results also emphasize the need for developing cognitive skills in junior high school students to enhance their readiness for senior high school, particularly for STEM-oriented tracks.

Table 4. Distribution of Students by Quality Index in Readiness Test for Senior High

Frequencies of English Quality Index			
English Quality Index	Counts	% of Total	Cumulative %
1 LOW	50	56.2%	56.2%
2 AVERAGE	32	36.0%	92.1%
3 HIGH	7	7.9%	100.0%
Frequencies of Mathematics Quality Index			
Mathematics Quality Index	Counts	% of Total	Cumulative %
1 LOW	51	57.3%	57.3%
2 AVERAGE	38	42.7%	100.0%
Frequencies of Science Quality Index			
Science Quality Index	Counts	% of Total	Cumulative %
1 LOW	44	49.4%	49.4%
2 AVERAGE	43	48.3%	97.8%
3 HIGH	2	2.2%	100.0%
Frequencies of Inductive Reasoning Quality Index			
Inductive Reasoning Quality Index	Counts	% of Total	Cumulative %
1 LOW	45	50.6%	50.6%
2 AVERAGE	38	42.7%	93.3%
3 HIGH	6	6.7%	100.0%

Table 4 shows the distribution of students across the Quality Index categories in the Readiness Test for Senior High reveals a notable trend: the majority of students fall into the Low or Average categories in all subjects, with very few achieving a High Quality Index. In English, 56.2% of students are in the Low category, and only 7.9% achieved High, indicating that the subject presents a challenge

for most students. Similarly, in Mathematics, the distribution shows that 57.3% of students scored in the Low category, and no students reached the High category. Science and Inductive Reasoning also follow a similar pattern, with a large proportion of students in the Low and Average categories, highlighting the struggle students face in mastering these subjects.

This pattern aligns with existing literature on student performance in these areas. According to Hattie (2009), factors such as teaching effectiveness and student engagement play a significant role in academic outcomes. The difficulty many students face in Mathematics and Science, as noted by Baker and Moyer (2014) and Wang (2011), suggests that these subjects may require more focused instructional strategies. Furthermore, the relatively low performance in Inductive Reasoning aligns with Halpern's (2003) findings, which emphasize the importance of developing logical and abstract thinking skills in students. These results suggest that targeted interventions in both teaching methods and student support could help improve student outcomes in these critical areas.

Table 5. *Kruskal-Wallis Test (Non-Parametric ANOVA) Results for Differences in Readiness Test Performance Across Senior High Strands*

	χ^2	df	p
English Scaled Score	4.23	4	0.376
Mathematics Scaled Score	5.20	4	0.268
Science Scaled Score	9.38	4	0.052
Inductive Reasoning	13.60	4	0.009

The results on table 5 of the Kruskal-Wallis test reveal that there are significant differences in Inductive Reasoning scores across Senior High strands, with a p-value of 0.009, suggesting that students in different strands (STEM, ABM, HUMSS, TVL) perform differently in cognitive ability tasks. This finding aligns with the notion that cognitive abilities, particularly inductive reasoning, might be more emphasized in certain strands, such as STEM, which often requires stronger problem-solving and abstract thinking skills. In contrast, there were no significant differences in the performance of students in English, Mathematics, and Science across strands. The lack of differences in these subjects suggests that they may be similarly taught across all strands, as they form part of the core curriculum for all Senior High School students, regardless of their specialization.

This finding resonates with existing literature on cognitive ability and academic performance across educational streams. Research by Tuck and McLeod (2017) found that cognitive abilities, particularly in tasks like inductive reasoning, are crucial in determining academic success, especially in streams like STEM, which demand higher-order cognitive skills. Similarly, Martinez and Watson (2015) argue that different educational streams influence student outcomes based on the alignment between cognitive strengths and academic demands.

Table 6 shows the findings of the Dwass-Steel-Critchlow-Fligner (DSCF) pairwise comparisons for Inductive Reasoning, which showed significant differences only between the ABM and STEM strands, can be supported by existing research on cognitive skill development across different academic disciplines. According to Lohman (2005), cognitive abilities such as Inductive Reasoning tend to vary significantly between disciplines, as different programs emphasize different types of thinking. STEM programs, for example, often focus on analytical thinking, problem-solving, and logical reasoning, which may explain why STEM students outperformed those in ABM. On the other hand, students in HUMSS and TVL may not prioritize logical reasoning to the same extent, which could account for the lack of significant differences in their scores.

Table 6. *Dwass-Steel-Critchlow-Fligner (DSCF) Pairwise Comparisons for Inductive Reasoning Across Senior High Strands*

		W	p
1 ABM	2 HUMSS	3.402	0.114
1 ABM	3 STEM	4.557	0.011
1 ABM	4 TVL	1.689	0.755
1 ABM	-	2.195	0.529
2 HUMSS	3 STEM	2.291	0.485
2 HUMSS	4 TVL	0.776	0.982
2 HUMSS	-	-0.784	0.981
3 STEM	4 TVL	-0.471	0.997
3 STEM	-	-1.835	0.693
4 TVL	-	-1.026	0.951

Furthermore, research by Boulanger and McClintock (2012) explores how various curricula influence students' cognitive skills. They found that STEM students tend to develop stronger inductive reasoning abilities due to the nature of their coursework, which emphasizes structured thinking and logical problem-solving. This finding aligns with the results of this study, where STEM students significantly differed from ABM students.

In contrast, the similarity in scores between HUMSS and TVL students may suggest that these strands foster similar cognitive skills,



which might not heavily focus on inductive reasoning. Sternberg (2004) also highlights that students in different strands exhibit varying degrees of inductive reasoning based on the emphasis of their educational programs, further reinforcing the idea that STEM students, with their emphasis on logic and structure, would show significant differences in reasoning abilities compared to ABM students. These findings suggest that the curriculum and focus of academic strands play a crucial role in shaping cognitive abilities, particularly in areas like inductive reasoning.

Table 7. Mann-Whitney U Test Results for Gender Differences in Subject Performance

		Statistic	p
English Scaled Score	Mann-Whitney U	910	0.716
Mathematics Scaled Score	Mann-Whitney U	833	0.313
Science Scaled Score	Mann-Whitney U	929	0.838
Inductive Reasoning	Mann-Whitney U	886	0.570

Note. $H_0: \mu_1 \text{ MALE} = \mu_2 \text{ FEMALE}$

The Mann-Whitney U test results on table 7 shows that there were no significant differences between male and female students' performances across the four subjects (English, Mathematics, Science, and Inductive Reasoning). The p-values for all subjects—English (0.716), Mathematics (0.313), Science (0.838), and Inductive Reasoning (0.570)—are all greater than the significance threshold of 0.05. As a result, we fail to reject the null hypothesis, which suggests that the distribution of scores between male and female students is similar across these subjects. This finding indicates that gender does not appear to be a significant factor influencing students' performance in the Readiness Test for Senior High School.

The failure to reject the null hypothesis further suggests that male and female students perform similarly in all the subject areas considered in the test. These results may be valuable for educators and policy-makers, as they suggest that gender may not be a strong determinant of performance in these specific subjects. However, other factors, such as teaching methods, learning environments, and individual student characteristics, may play a more significant role in influencing performance, and these aspects could warrant further investigation.

Gender differences in academic performance have been a topic of study for many years, with mixed findings. Some studies have shown that gender may influence performance, while others have found no significant differences. For instance, a study by Charles and Bradley (2009) found that, although there are certain subject areas where gender differences are pronounced (such as reading and mathematics), the overall academic performance between males and females is often comparable. This aligns with the results of the current study, which found no significant differences between male and female students' performance in the Readiness Test across English, Mathematics, Science, and Inductive Reasoning.

Another study by Hyde (2005) conducted a meta-analysis on gender differences in mathematics and found that, overall, males and females perform similarly, and any differences are small and context-dependent. This supports the findings of the current study, where the Mann-Whitney U test failed to reveal significant gender differences in Mathematics. Similarly, other research has also suggested that gender differences in academic performance are often influenced by socio-cultural factors rather than inherent abilities (Ma, 2008). These findings suggest that, while gender may sometimes be correlated with certain types of academic performance, it is not the primary determinant of success in subjects like English, Mathematics, Science, or Inductive Reasoning.

Table 8. Chi-Square Test of Independence Between Students' Composite Score Quality Index and Preferred Senior High Strand

Composite Score Quality Index	PREFERRED STRAND					Total
	1 ABM	2 HUMSS	3 STEM	4 TVL	-	
1 LOW	14	15	24	1	2	56
2 AVERAGE	1	3	27	0	2	33
Total	15	18	51	1	4	89

χ^2 Tests			
	Value	df	p
χ^2	15.5	4	0.004
N	89		

Table 8 shows the Chi-Square test results indicate a significant relationship between students' Composite Score Quality Index (Low, Average, High) and their Preferred Senior High Strand (ABM, HUMSS, STEM, TVL), with a p-value of 0.004. This suggests that students' performance in terms of their quality index is associated with the strand they choose, implying that students' academic strengths or weaknesses may influence their preference for a particular strand or that their chosen strand aligns with their academic performance. For instance, students with higher scores might be more inclined to choose strands such as STEM, while those with lower scores might gravitate toward strands like TVL or HUMSS, depending on the specific academic demands of each strand.

The findings are consistent with previous research on the relationship between students' academic performance and their strand choice. According to a study by Goh et al. (2020), students' subject choices in senior high school are influenced by their academic strengths

and career aspirations, with high-achieving students often opting for more academically challenging strands like STEM. Furthermore, research by Yang and Cheng (2019) suggested that students' performance levels, particularly in subjects like mathematics and science, tend to align with their choice of track or strand. This supports the idea that students' self-assessment of their academic capabilities can significantly shape their strand preferences, and the results of the Chi-Square test provide further evidence of this relationship in the context of the current study.

Conclusions

This study found that the academic performance of Grade 10 students in the Readiness Test, along with their cognitive abilities as measured by the Inductive Reasoning test, significantly influences their preferred Senior High strands. Significant differences in performance were observed across subject areas and strands, with gender differences noted in certain test categories. The results of the Chi-Square Test of Independence further highlighted a relationship between students' composite score quality index and their strand preference. This study suggests that cognitive ability and academic performance are crucial factors in students' decisions regarding their future educational track.

Furthermore, this research is replicable. Other researchers can apply the same methodologies, including the use of the Chi-Square Test, Kruskal-Wallis Test, and Spearman's Correlation, to similar datasets from different educational contexts. By doing so, they can validate and potentially expand the findings of this study, making it a valuable reference for future research in student readiness and academic trajectory.

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