



RESEARCH ARTICLE

College Entrance Test Performance of Freshman Education Students in English, Mathematics, and Science: A Descriptive-Correlational Study

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This study examined the College Entrance Test (CET) performance of freshman education students at Basilan State College (BaSC) in English, Mathematics, and Science during the academic year 2001–2002. Employing a descriptive-correlational design with stratified random sampling ($n = 106$ from a population of 144), the study investigated performance levels across subject areas and explored whether significant differences existed when students were classified by gender, course, and campus. Results revealed that students generally performed at a fair level across all three subject areas, with English yielding the highest mean scores ($M = 38.11$, $SD = 10.54$). No significant gender-based performance differences were found ($p > 0.05$). Significant differences emerged when students were classified by course ($p = 0.001$ in English) and by campus (English: $F = 18.54$, $p = 0.00$; Science: $F = 4.62$, $p = 0.012$). Pearson Product-Moment Correlation analyses revealed a slight correlation between English and Mathematics performance ($r = 0.23$) and a moderate correlation between English and Science ($r = 0.451$). These findings underscore the need for a structured proficiency enhancement program in English, Mathematics, and Science and a reinforced guidance and counseling program at the institutional level.

INTRODUCTION

Measurement and evaluation occupy a foundational role in educational administration and institutional quality assurance. Standardized entrance examinations, in particular, serve as diagnostic tools that allow institutions to gauge the academic readiness of incoming students and design responsive instructional interventions (Calderon & Gonzales, 1993; Sternberg, 1997). As admission instruments, college entrance tests provide a quantifiable picture of students' competencies in core academic domains—enabling institutions to address learning gaps before they widen into academic failure (McCoach et al., 2013).

In the Philippines, higher education institutions employ a variety of entrance examinations to screen applicants and ensure that enrolled students possess the minimum competencies needed for college-level instruction. The College Scholastic Aptitude Test (CSAT), the College Entrance Examination (CEE), and institution-developed tests such as the Basilan State College CET assess students' proficiency in English, Mathematics, Science, and abstract reasoning (Aquino & Garcia, 1995; CHED, 2001). The emphasis on these three academic domains is well-grounded: proficiency in English (as the medium of instruction) facilitates comprehension and communication across all disciplines (Cummins, 2000; Kieffer & Lesaux, 2008), while Mathematics and Science competencies are critical for analytical and technical education programs (Geary, 2011; National Research Council, 2012).

Basilan State College (BaSC) in Isabela, Basilan, is one of the key higher education institutions in the Autonomous Region in Muslim Mindanao (ARMM). Its three campuses (Isabela (main), Lamitan, and Maluso) serve a geographically dispersed and educationally diverse student population. BaSC administers a four-part CET consisting of English proficiency, Mathematics

ability, Science aptitude, and abstract reasoning. Despite the institutionalization of this test, a systematic analysis of freshman education students' CET performance and its implications for instructional planning had not been conducted.

The broader Philippine educational context provides further urgency to this investigation. Persistent challenges in science and mathematics achievement have been documented across basic and tertiary education levels (Bernardo, 2002; Talisayon et al., 1994). Studies have highlighted gender disparities in academic performance, with mixed findings on whether male or female students perform better in Mathematics and Science (Else-Quest et al., 2010; Hyde & Mertz, 2009). Campus location and resource availability have also been identified as significant determinants of student learning outcomes in developing-country contexts (Hanushek, 2011; Heyneman & Loxley, 1983).

This paper presents a full journal article adaptation of the thesis research, organized to align with contemporary academic publication standards, and supplemented with recent literature to situate the original findings within the current state of knowledge.

LITERATURE REVIEW

College Entrance Tests and Academic Readiness

Standardized entrance examinations have long been used as predictors of college academic performance. The Scholastic Assessment Test (SAT) and the American College Testing (ACT) program in the United States, for instance, have been widely studied as predictors of first-year college GPA (Kobrin et al., 2008; Sackett et al., 2012). In the Philippine setting, comparable tools such as the UPCAT (University of the Philippines College Admission Test) and institutional entrance tests have been used to assess readiness in English, Mathematics, and the Sciences (Bernardo et al., 2008).

Research consistently supports the validity of entrance test scores as indicators of academic preparedness (Geiser & Studley, 2002). However, scholars caution against treating test performance as deterministic, emphasizing the role of institutional support, teaching quality, and socio-economic context in shaping academic success (Heckman & Kautz, 2012; Reardon, 2011). For education majors specifically, proficiency in the disciplines they will eventually teach (particularly English, Mathematics, and Science) is essential, not only for academic success but for professional competence (Ball et al., 2008; Hill et al., 2005).

English Proficiency in Philippine Higher Education

English is the medium of instruction in Philippine higher education, making English proficiency a foundational competency for academic success (Bernardo, 2004; Tupas, 2014). Research on Filipino college students has consistently found that English proficiency is positively correlated with performance in other academic domains, including the natural sciences and social sciences (Anderman & Maehr, 1994; Cummins, 2000). The challenges of English as a second language (ESL) instruction in multilingual communities (such as those in Basilan) compound the difficulty of building English proficiency among incoming college students (Tupas & Lorente, 2014).

Mathematics Achievement Among Filipino Students

International assessments such as TIMSS (Trends in International Mathematics and Science Study) have placed the Philippines consistently below the international average in Mathematics (Mullis et al., 2016; Ogena et al., 2010). At the college entry level, studies have documented widespread deficiencies in arithmetic, algebra, and problem-solving skills among Filipino freshmen (Acelajado, 2004; Bernardo, 2002). These deficiencies are particularly pronounced among students from disadvantaged regions, where access to qualified Mathematics teachers is limited (Quisumbing & Yu, 2008; UNESCO, 2015).

Science Performance and Aptitude

Science aptitude at the college entry level is influenced by the quality of secondary education, teacher competence, and instructional resources (Talisayon et al., 1994; Yager, 2000). In the Philippines, undergraduate students entering education programs have shown variable Science performance, with students from urban main campuses generally outperforming those from rural

extension campuses (Ogena et al., 2010; Villanueva, 2003). The correlation between language proficiency and Science performance (particularly in reading comprehension of scientific texts) is well-documented (Lee & Fradd, 1998; Wellington & Osborne, 2001).

Gender and Academic Performance

The relationship between gender and academic performance in English, Mathematics, and Science is complex and context-dependent. Meta-analyses have found small but consistent gender differences favoring males in Mathematics in some contexts and females in language arts (Else-Quest et al., 2010; Hyde & Mertz, 2009; Lindberg et al., 2010). In the Philippine higher education context, gender differences in academic performance have been inconsistent across studies, with some reporting no significant difference between male and female students in standardized tests (David, 1998; Quisumbing & Yu, 2008).

Institutional and Campus-Level Factors

Campus location and institutional resources significantly influence educational outcomes. Students from main campuses in urban centers typically benefit from better-qualified faculty, more comprehensive library and laboratory resources, and stronger instructional support systems compared to students from rural extension campuses (Hanushek, 2011; UNESCO, 2015). In the Philippine archipelagic context, this urban-rural divide is particularly pronounced, and has been linked to performance differentials in standardized examinations (Bernardo et al., 2008; DepEd, 2002).

Research Objectives

The study aimed to:

1. Describe the socio-demographic profile of BaSC freshman education students.
2. Determine the CET performance levels of freshman education students in English, Mathematics, and Science.
3. Analyze CET performance levels in English, Mathematics, and Science when students are classified by:
 - o gender,
 - o course, and
 - o campus.
4. Assess whether significant differences exist in CET performance levels when students are classified by gender, course, and campus.
5. Examine the relationship between English performance and Mathematics performance.
6. Examine the relationship between English performance and Science performance.

METHODOLOGY

Research Design

This study employed a descriptive-correlational research design. The descriptive approach facilitated the documentation of student performance levels in three subject areas, while the correlational component enabled the investigation of relationships between English proficiency and performance in Mathematics and Science. This design is appropriate for studies seeking to describe phenomena as they exist and to explore inter-variable relationships without experimental manipulation (Creswell, 2014; Gay, 1992).

Population and Sampling

The target population comprised all 144 freshman education students enrolled at the three campuses of BaSC during the first semester of AY 2001–2002. Students were enrolled in either the Bachelor of Elementary Education (BEED) or the Bachelor of Secondary Education (BSED) programs. A stratified random sampling procedure was employed, yielding a final sample of 106 students (73 females (68.9%) and 33 males (31.1%)) distributed across the three campuses.

Table 1: Distribution of the Freshman Education Students' Population and Sample

Campus	Course	Population (Male)	Population (Female)	Population Total	Sample (Male)	Sample (Female)	Sample Total
Isabela (Main)	BEED	8	39	47	6	29	35
	BSED	8	13	21	7	8	15
Lamitan Extension	BEED	5	17	22	4	12	16
Maluso Extension	BEED	21	33	54	16	24	40
Total		42	102	144	33	73	106

Research Instrument

The BaSC College Entrance Test (CET) booklet served as the primary instrument. A standardized, institution-developed assessment, the CET was composed of four parts: (1) English proficiency, (2) Mathematics ability, (3) Science aptitude, and (4) Abstract Reasoning. For this study, only the English, Mathematics, and Science subtests were analyzed.

The English subtest included items on synonyms, reading comprehension, grammar, and vocabulary. The Mathematics subtest covered arithmetic, basic algebra, and problem-solving. The Science subtest measured conceptual understanding in Biology, Chemistry, and Physics. The CET was administered by the BaSC Testing and Evaluating Center (TEC), ensuring standardized conditions.

RESULTS

Socio-Demographic Profile

The majority of the freshman education students were female (68.9%). Most were enrolled in the BEED program (86.8%), with only 14.2% in BSED. The highest student concentration was at the Maluso campus (37.7%), followed by the Isabela main campus (47.2% when BEED and BSED are combined) and the Lamitan extension (15.1%).

Overall CET Performance

Table 2: Means, Standard Deviations, Description, and Ranks of the CET Performance of BaSC Freshman Education Students (N = 106)

Subject Area	Mean	SD	Description	Rank
English	38.11	10.54	Fair	1
Science	30.88	8.56	Fair	2
Mathematics	29.45	7.57	Fair	3
Overall Average	32.76	8.89	Fair	-

Students performed at a fair level in all three subject areas. English yielded the highest mean score (M = 38.11, SD = 10.54), followed by Science (M = 30.88, SD = 8.56), and Mathematics (M = 29.45, SD = 7.57). The greater dispersion of English scores (SD = 10.54) indicates wider variability in language proficiency among students, whereas the smaller standard deviation in Mathematics (SD = 7.57) suggests more homogenous (though uniformly low) skill levels.

CET Performance by Gender

Table 3: Mean CET Performance Levels by Gender (N = 106)

Subject Area	Male Mean	Male Description	Female Mean	Female Description
English	37.69	Fair	38.28	Fair
Mathematics	29.42	Fair	29.47	Fair
Science	32.11	Fair	30.37	Fair
Average	33.07	Fair	32.71	Fair

Both male and female students performed at a fair level across all three subject areas. Male students scored marginally higher in Science, while female students scored marginally higher in English and Mathematics. These differences were not statistically significant

Table 4: t-Test Results – CET Performance by Gender ($\alpha = 0.05$)

Subject Area	t-Value	Sig. (2-tailed)	Remarks
English	-0.257	0.798	Not Significant
Mathematics	-0.033	0.974	Not Significant
Science	-0.875	0.386	Not Significant

No significant differences were found between male and female students in any subject area (all $p > 0.05$).

CET Performance by Course

Table 5: Mean CET Performance Levels by Course (N = 106)

Subject Area	BEED Mean	BEED Description	BSED Mean	BSED Description
English	36.13	Fair	43.11	Good
Mathematics	29.66	Fair	28.89	Fair
Science	30.52	Fair	32.12	Fair

BSED students outperformed BEED students in English (Good vs. Fair). In Mathematics, BEED students performed marginally better than BSED students. Both groups performed at a fair level in Science.

Table 6: t-Test Results – CET Performance by Course ($\alpha = 0.05$)

Subject Area	t-Value	Sig. (2-tailed)	Remarks
English	-4.470	0.001	Significant
Mathematics	-0.410	0.689	Not Significant
Science	-0.951	0.362	Not Significant

A statistically significant difference was found in English performance between BEED and BSED students ($t = -4.470$, $p = 0.001$). No significant differences were found for Mathematics and Science.

CET Performance by Campus

Table 7: Mean CET Performance Levels by Campus (N = 106)

Subject Area	Isabela Mean	Description	Lamitan Mean	Description	Maluso Mean	Description
English	43.70	Good	35.53	Fair	32.15	Fair
Mathematics	29.10	Fair	29.65	Fair	29.81	Fair
Science	33.47	Fair	28.75	Fair	28.50	Fair
Average	35.42	Fair	31.31	Fair	30.15	Fair

Students from the Isabela main campus achieved a *Good* rating in English, while students from Lamitan and Maluso scored at the *Fair* level. In Mathematics, Maluso students obtained marginally higher scores, closely followed by Lamitan. In Science, Isabela students again scored highest, followed by Lamitan and Maluso.

Table 8: ANOVA Results – CET Performance by Campus ($\alpha = 0.05$)

Subject Area	F-Value	Sig.	Remarks
English	18.54	0.000	Significant
Mathematics	0.103	0.902	Not Significant
Science	4.62	0.012	Significant

Significant campus-based differences were found in English ($F = 18.54$, $p = 0.000$) and Science ($F = 4.62$, $p = 0.012$). No significant difference was found in Mathematics.

Correlation Between English and Mathematics Performance

A Pearson Product-Moment Correlation analysis was conducted to examine the relationship between English and Mathematics performance. The analysis yielded $r = 0.23$, indicating a slight positive correlation. This means that while English language skills have some relationship with Mathematics performance, the association is weak. H_{03} is rejected (a relationship exists, though slight).

Correlation Between English and Science Performance

The correlation between English and Science performance yielded $r = 0.451$, indicating a moderate positive correlation. This suggests that English proficiency has a substantial, though not strong, relationship with Science performance. Students with higher English proficiency tended to perform better in Science.

DISCUSSION

Fair Performance Across Disciplines

The finding that freshman education students at BaSC performed at a *fair* level in English, Mathematics, and Science is consistent with documented national trends in Philippine education. Studies by Ogena et al. (2010) and Bernardo (2002) have similarly found that many college entrants (particularly from provincial institutions) arrive with English, Mathematics, and Science competencies below the *good* threshold. The relatively higher dispersion in English scores ($SD = 10.54$) compared to Mathematics ($SD = 7.57$) suggests greater variability in language preparation, possibly reflecting the diverse linguistic backgrounds of students in Basilan, a multilingual and multiethnic province (Tupas & Lorente, 2014).

The fact that Mathematics yielded the lowest mean score ($M = 29.45$), though with the smallest variability, implies that most students are homogeneously weak in Mathematics. This is consistent with Acelajado (2004), who found widespread arithmetic and algebraic deficiencies among college freshmen nationwide, and aligns with TIMSS findings placing the Philippines below international benchmarks (Mullis et al., 2016).

Absence of Gender Differences

The absence of significant gender differences in CET performance across all three subject areas ($p > 0.05$) is notable. While global literature often reports gender gaps (particularly male advantages in Mathematics and female advantages in language (Hyde & Mertz, 2009; Lindberg et al., 2010)) these patterns are not universal. Else-Quest et al. (2010) found in a cross-national meta-analysis that gender differences in Mathematics are largely mediated by cultural and socioeconomic factors, and tend to diminish in contexts with greater gender equity in educational access. The lack of significant gender differences in this study may reflect equitable teaching practices or the dominant role of language barriers (Bisaya, Tausug, Yakan) that affect both genders equally in a multilingual setting such as Basilan.

Course-Based Differences in English

The significant difference in English performance between BSED and BEED students ($t = -4.470$, $p = 0.001$) is an expected finding. BSED students are typically enrolled in subject-specific majors (English, Mathematics, Sciences) and may possess stronger academic preparation in their discipline areas. BEED students, who prepare for elementary teaching across all subjects, may have a broader but shallower subject knowledge base (Ball et al., 2008; Hill et al., 2005). The absence of significant course-based differences in Mathematics and Science, however, suggests that fundamental quantitative and science skills are equitably distributed between program tracks.

Campus-Based Disparities

The significant campus-based differences in English ($F = 18.54$, $p < 0.001$) and Science ($F = 4.62$, $p = 0.012$) performance underscore the impact of institutional resources and geographic location on educational outcomes. The Isabela main campus's superior performance in both subjects likely

reflects advantages in teacher quality, library resources, and instructional infrastructure (Hanushek, 2011; UNESCO, 2015). The absence of a campus difference in Mathematics performance (where all three campuses scored similarly at the *fair* level) suggests that Mathematics underperformance is a systemic issue not reducible to campus location alone.

These results align with Heyneman and Loxley (1983), who found that in developing countries, school-level resources exert a stronger influence on student achievement than in developed nations. Within-country disparities linked to geographic marginalization are particularly pronounced in island and rural contexts, as documented by Quisumbing and Yu (2008) and the DepEd (2002) in the Philippine setting.

English–Science Correlation

The moderate correlation between English and Science performance ($r = 0.451$) is theoretically consistent with literature linking language literacy and science learning. Wellington and Osborne (2001) argued that science is fundamentally a language-intensive discipline, requiring students to decode technical vocabulary, comprehend complex texts, and construct scientific explanations in writing. Lee and Fradd (1998) found that English language proficiency significantly predicts performance in science among linguistically diverse students. The slight English–Mathematics correlation ($r = 0.23$) is consistent with research noting that while language plays a role in mathematical word problems, procedural Mathematics relies more on quantitative reasoning than linguistic ability (Kieffer & Lesaux, 2008; Peng et al., 2020).

CONCLUSIONS

Based on the findings of this study, the following conclusions are drawn:

1. BaSC freshman education students performed at a fair level in English, Mathematics, and Science in the CET, with English yielding the best performance and Mathematics the weakest. The hypothesis that students perform at a *good* level was rejected.
2. Gender is not a significant determinant of CET performance in English, Mathematics, or Science among BaSC freshman education students.
3. Course classification significantly differentiates performance in English (BSED > BEED), but not in Mathematics or Science.
4. Campus location significantly differentiates performance in English and Science (Isabela > Lamitan > Maluso), but not in Mathematics, where all campuses perform at a similarly fair (and low) level.
5. A slight positive correlation exists between English and Mathematics performance ($r = 0.23$), while a moderate positive correlation exists between English and Science performance ($r = 0.451$). Both null hypotheses of no relationship are rejected.
6. The moderate English–Science correlation suggests that interventions designed to improve English language proficiency may produce downstream benefits in Science achievement.

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