
| RESEARCH ARTICLE

Enhancing Students' Self-Efficacy and Mathematics Achievement Through Competency Sub-Tasking

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| ABSTRACT

This study assessed Grade 11 students' self-efficacy and Mathematics achievement when exposed to competency sub-tasking at two identified public high schools in Cebu during the 2022-2023 school year, as the basis for the learning enhancement plan. A descriptive-correlational method was employed, with 154 Grade 11 students chosen as respondents. The researchers used a survey questionnaire consisting of three parts to gather information. Part I provided information on students' profiles. Part II questions focused on students' self-efficacy in learning mathematics when exposed to competency sub-tasking. Part III consists of individual students' assessment scores. The data were analyzed using percentages, frequencies, means, standard deviations, and Pearson's *r*. Based on the findings, most students were 17 years old, most parents were high school graduates, and most students had low combined family monthly incomes. As revealed by the study, the student respondents' performance on the mathematics achievement test using the competency sub-tasking strategy was very satisfactory (at a proficient level). Regarding students' self-efficacy, the respondents agreed, indicating that most of the time the performance indicators were true. It has been found that there is a significant relationship between students' self-efficacy and academic performance when they are exposed to competency sub-tasking. It is recommended that the learning enhancement plan be implemented to enhance achievement in general mathematics competencies in modular-based instruction.

| KEYWORDS

Teaching Mathematics, students' self-efficacy, competency sub-tasking performance, descriptive-correlation, mathematics, Cebu

| ARTICLE INFORMATION

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1. Introduction

Mathematics is a foundational discipline in Senior High School education, providing learners with the cognitive tools necessary for analytical reasoning, problem-solving, and informed decision-making. Proficiency in mathematics is widely associated with academic achievement (Cabuquin & Aboejo, 2023), career readiness (Moleta & Yango, 2023), and participation in a knowledge-based economy (Zhu et al., 2024). Nevertheless, persistent difficulties in mathematics learning remain a global and local concern (My et al., 2025). The abstract nature of mathematical concepts and the high cognitive demands of problem solving often result in students' limited conceptual understanding, slow progression, and widening achievement gaps. When foundational competencies are not fully developed, learners frequently require extensive remediation before they can meaningfully engage with more advanced content, thereby perpetuating cycles of underachievement (Barr, 2025).

The need to address these persistent gaps emphasizes the importance of responsive and differentiated instructional practices. Traditional pedagogical approaches, which often rely on uniform pacing and generalized instruction, often fail to accommodate learners' diverse levels of readiness, leading to disengagement and low performance (Amirova, 2025). In this

regard, competency sub-tasking has emerged as a promising pedagogical strategy. Competency sub-tasking involves decomposing complex learning competencies into smaller, attainable sub-tasks that are aligned with students' existing skill levels. Rather than diluting academic content, this approach restructures the learning pathway to make competencies more accessible while preserving curricular rigor. By breaking complex competencies into manageable parts, sub-tasking can lessen cognitive overload, boost learner engagement, and improve instructional clarity, especially for students who find traditional instruction challenging (Freeman, 2018; Hougaard & Knoche, 2024).

It should be noted that students' mathematics achievement depends on the following factors: math anxiety, mathematics confidence, and student participation in a mathematics course, all of which take into account self-efficacy (Brezavšček et al., 2020). Their sense of self-efficacy significantly influences students' mathematical achievement. Students who are confident in their ability to learn mathematics will be successful in the subject because they can effectively manage their enthusiasm, leading to better task completion. Conversely, students who lack confidence in their ability to learn mathematics will perform poorly (Ariati et al., 2022). High self-efficacy students employ self-control techniques, are driven and self-assured in their abilities, and perform better than their peers (Al-Abyadh & Abdel Azeem, 2022). The researcher believed that competency sub-tasking is a promising strategy to enhance self-efficacy and Mathematics achievement, as it allows teachers to break down competencies to engage students' enthusiasm for the activities.

The implementation of competency sub-tasking is further supported by national policy. The Department of Education, through DepEd Order No. 12, s. 2020, authorizes the unpacking of essential competencies into more specific learning competencies and the development of additional sub-competencies based on learners' needs and contextual constraints. This policy framework provides a strong institutional basis for innovative instructional interventions to improve learning continuity and address diverse learner profiles.

This study aims to address the persistent learning gap in Grade 11 mathematics by developing and implementing a competency sub-tasking intervention. The intervention is designed to scaffold learning activities and provide structured remediation materials, with the goal of enhancing students' mastery of mathematical competencies, improving their engagement, and strengthening their self-efficacy.

2. Literature Review

This study was anchored on three major theories: Bandura's (1977) Self-Efficacy Theory, Rogers's (2003) Diffusion of Innovations Theory, and Slavich's (2011) Transformational Teaching Theory, and supported by three legal bases: Republic Act No. 10533 or the Enhanced Basic Education Act of 2013, DepEd Order No. 012 s.2020 on the Adoption of the Basic Education Learning Continuity Plan (BE-LCP) for School Year 2020-2021 in Light of the COVID-19 Pandemic, and DepEd Order No. 018 s.2021 on the Interim Guidelines on Giving Awards and Recognition in Light of the BE-LCP for School Year 2020-2021.

Self-Efficacy Theory explains the extent to which individuals believe they can perform tasks successfully, particularly in challenging situations (Bandura, 1977). Studies indicate that students' mathematical self-efficacy is strongly influenced by educational structures and that teachers play a critical role in developing competencies that enhance learners' practical skills and confidence (Arens et al., 2022; Purwanto et al., 2023). Perceived teacher support, such as simplifying tasks and providing stepwise guidance, strengthens students' self-efficacy and positively impacts their performance (Huang & Wang, 2023). Rogers' Diffusion of Innovations Theory underscores the need for teachers to adopt innovative teaching methods and technological tools, transition from traditional face-to-face instruction to virtual or technology-aided learning, and employ competency sub-tasking to improve mathematics achievement (Rogers, 2003). Moreover, Slavich's Transformational Teaching Theory emphasizes the importance of fostering lifelong learning and positive development in students by creating engaging, meaningful learning experiences that motivate and sustain interest, leading to long-term cognitive and behavioral changes (Yacek et al., 2021).

Legally, Republic Act No. 10533 mandates that basic education graduates be productive and globally competent, with educators providing instructional materials that meet students' needs to enhance learning outcomes (Wong & Hughes, 2023). DepEd Order No. 012 s.2020, implemented during the COVID-19 pandemic, highlights curriculum decongestion, prioritization of essential competencies, and flexible learning strategies, which are addressed through competency sub-tasking by breaking down complex mathematics competencies into smaller, manageable tasks that reduce cognitive overload, support independent learning, and build students' confidence (Warren et al., 2021).

Additionally, DepEd Order No. 018 s.2021 emphasizes motivation, encouragement, and formative recognition in flexible learning conditions, validating incremental achievements and reinforcing self-efficacy by focusing on effort, persistence, and improvement rather than solely on high-stakes assessments (Hussein et al., 2022). Grounded in these theoretical and legal foundations, this study aims to develop competency subtasks for all Grade 11 General Mathematics competencies, simplifying

content to align with learners' cognitive levels, thereby gradually enhancing knowledge, skills, and self-efficacy, and ensuring a structured, evidence-based approach to improving numeracy.

3. Research Methodology

This study employed a descriptive-correlational design, which allowed the researchers to examine changes in students' self-efficacy and their potential impact on mathematics achievement. The study focused on Grade 11 students at two schools on Camotes Island, Cebu Province, who were enrolled in most core mathematics subjects in the senior high school curriculum. A total of 154 respondents were selected using purposive sampling to ensure inclusion of students directly exposed to competency-based sub-tasking in mathematics. Data were collected using an adapted survey questionnaire divided into three parts: Part I captured students' demographic profiles; Part II measured students' self-efficacy in learning mathematics under competency sub-tasking using a four-point Likert (Nicolaidou & Philippou, 2004); and Part III recorded students' academic performance through a 40-item achievement test derived from DepEd modules and the Most Essential Learning Competencies (MELC) standards.

The data collection procedure followed a systematic approach. First, permission was sought from the Cebu Province Division Superintendent. Upon approval, students completed a pre-test of the self-efficacy questionnaire and achievement test at the start of the second quarter. Competency sub-tasks were then implemented in collaboration with subject teachers during instructional sessions. At the end of the quarter, a post-test was administered to measure students' progress and assess the effectiveness of competency sub-tasking.

For data analysis, descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize and interpret respondents' profiles, self-efficacy levels, and achievement results. Weighted mean determined the level of self-efficacy in mathematics, while Pearson's r was employed to assess the relationship between self-efficacy and mathematics achievement, providing insights into the impact of competency sub-tasking on student learning outcomes.

4. Results and Discussion

The following section details the data gathered and presents the findings in tables.

4.1 Profile of the Respondents

This section presents results on age and gender, parents' highest educational attainment, and the combined family monthly income.

Table 1: Age and Gender Profile of the Respondents
n= 154

Age	School A		School B		Combined Data	
	F	%	F	%	F	%
21 years old	0	0	0	0	0	0
20 years old	0	0	0	0	0	0
19 years old	0	0	0	0	0	0
18 years old	6	6.00	6	11.11	12	7.79
17 years old	71	71.00	13	24.07	84	54.55
16 years old	23	23.00	34	69.96	57	37.01
15 years old	0	0	1	1.85	1	0.65
Total	100	100	54	100	154	100.00

Average Age	16.83 years old		16.44 years old		16.69 years old	
Gender for Students						
Male	37	37.00	22	40.74	59	38.31
Female	63	63.00	32	59.26	95	61.69
Total	100	100.00	54	100.00	154	100.00

The demographic profile of Grade 11 students revealed notable patterns in age and gender that may influence learning dynamics and outcomes. At School A School, the majority of students were 17 years old (71%), followed by 16-year-olds (23%) and 18-year-olds (6%), with an average age of 16.83 years, while females comprised 63% of the population. School B had a slightly younger cohort, with most students aged 16 (69.96%), an average age of 16.44 years, and females representing 59.26% of the population. Across both schools, the combined average age was 16.69 years, with females comprising 61.69% and males 38.31% of respondents. These findings align with the relative age effect (RAE), in which older students within a cohort often demonstrate higher academic performance due to cognitive and social maturation (Mavilidi et al., 2022; Urruticochea et al., 2021). The demographic composition underscores the importance of adopting gender-sensitive and age-appropriate instructional strategies to ensure equitable participation and engagement for all learners.

Table 2: Parents' Highest Educational Attainment
n=154

Educational Attainment	School A				School B				Combined Data			
	F	Father %	F	Mother %	F	Father %	F	Mother %	F	Father %	F	Mother %
College Graduate	2	2.00	13	13.00	0	0	1	1.85	2	1.30	14	9.09
College Level	6	6.00	22	22.00	11	20.37	16	29.63	17	11.04	38	24.68
High School Graduate	40	40.00	33	33.00	16	29.63	15	27.78	56	36.36	48	31.17
High School Level	23	23.00	26	26.00	9	16.67	10	18.52	32	20.78	36	23.38
Elementary Graduate	15	15.00	6	6.00	5	9.26	8	14.81	20	12.99	14	9.09
Elementary Level	12	12.00	0	0	12	22.22	4	7.41	24	15.58	4	2.60
No Formal Schooling	2	2.00	0	0	1	1.85	0	0	3	1.95	0	0
Total	100	100.00	100	100.00	54	100.00	54	100.00	154	100.00	154	100.00

Table 2 presents the educational attainment of parents from School A, revealing notable variations that may influence students' learning experiences and engagement. At School A, fathers' education ranged from no formal schooling (2%) to college graduates (2%), with the largest proportions completing high school (40%) or high school level (23%). Mothers had slightly higher educational levels: 13% were college graduates, and 33% had completed high school. In School B, none of the fathers were college graduates; 20.37% had attained college-level education, while the majority completed high school (29.63%) or elementary school (22.22%). Mothers at School B followed a similar pattern, with only 1.85% holding college degrees and the majority achieving college-level (29.63%) or high school (27.78%) education. When aggregated across both schools, the data indicated that most parents had completed secondary education: 31.17% of mothers were high school graduates, and 23.38%

were at the high school level, reflecting a generally educated parent population capable of supporting their children's academic development.

The observed patterns in parental education have important implications for student learning outcomes. Higher levels of parental education are associated with greater capacity to provide academic support at home, facilitate access to learning resources, and foster positive educational attitudes. This aligns with findings by Khattab et al. (2022) and Obot et al. (2020), who reported that parental educational attainment significantly influences learners' academic performance and occupational aspirations. The predominance of secondary-educated parents suggests that most students benefit from foundational guidance in their studies, while variations in higher education levels may contribute to differential support and expectations

Table 3: Parents' Combined Family Monthly Income
n=154

Combined Family Monthly Income	School A		School B		Combined Data	
	F	%	F	%	F	%
Above 30,000	6	6.00	3	5.56	9	5.84
25,001-30,000	16	16.00	7	12.96	23	14.94
20,001-25,000	22	22.00	10	18.52	32	20.78
15,001- 20,000	12	12.00	30	55.56	36	23.38
10,001-15,000	11	11.00	1	1.85	12	7.79
10,000 and below	33	33.00	3	5.56	42	27.27
Total	100	100.00	54	100.00	154	100.00

Table 3 presents the family income distribution of respondents from two schools in Cebu, revealing distinct socioeconomic patterns that may influence students' learning experiences and access to educational resources. At School A, the majority of families earned 10,000 or less (33%), followed by 20,001–25,000 (22%), 15,001–20,000 (12%), and 25,001–30,000 (16%), with a small proportion earning more than 30,000 (6%). In School B, most families (55.56%) earned between 15,001 and 20,000, while smaller percentages reported incomes above 30,000 (5.56%) or below 10,000 (5.56%). When combined, the data indicated that 27.27% of families earned 10,000 or less, 23.38% between 15,001 and 20,000, and only 5.84% earned more than 30,000, demonstrating that a substantial proportion of students come from low- to middle-income households.

These socioeconomic patterns have important implications for educational engagement and performance. Learners from lower-income families may face additional challenges, such as limited access to study materials, reduced academic support at home, or increased household responsibilities, which can negatively affect persistence, motivation, and overall achievement (Drane et al., 2020; Kanter et al., 2021; Katz et al., 2022). Consequently, understanding family income levels is essential for designing targeted interventions, providing equitable learning opportunities, and implementing support mechanisms that address the specific needs of students from economically disadvantaged backgrounds. Such strategies can help mitigate the impact of socioeconomic disparities and enhance student outcomes in mathematics and other academic domains.

4.2 Level of Self-Efficacy of the Respondents in the Second Quarter When Exposed to Competency Sub-tasking

Self-efficacy toward learning mathematics when exposed to competency-based sub-tasking reflects students' positive outlooks toward mathematics

Table 4: Combined Data on Respondents' Self-efficacy in the Second Quarter When Exposed to Competency Sub-tasking

(n=154)			
S/N	Indicators	Weighted Mean	Interpretation
1.	I am one of the best students in Mathematics.	2.78	Agree
2.	I believe that I have a lot of strengths in Mathematics.	2.94	Agree
3.	Compared to other students, I am a smart student in Mathematics.	2.61	Agree
4.	Mathematics is one of my strengths.	2.72	Agree
5.	I usually can help my classmates when they ask me for help in problem-solving.	3.62	Strongly Agree
6.	I can usually solve any mathematical problem.	3.02	Agree
7.	I feel sure about myself in solving Mathematical problems.	2.78	Agree
8.	When I start answering a mathematical question, I usually feel that I would manage to give a solution.	2.94	Agree
9.	I can easily understand Mathematical problems.	2.84	Agree
10.	I am capable of doing good in Math.	3.09	Agree
Mean		2.93	Agree

Legend: Strongly Agree (SA) = 3.26-4.0, Agree (A) = 2.51 – 3.25, Disagree (D) = 1.76 - 2.50, Strongly Disagree (SD) = 1.00 - 1.75

Table 4 presents the self-efficacy profiles of Grade 11 students in mathematics, revealing that students exhibited the highest confidence in assisting classmates with problem-solving, with a weighted mean of 3.62 (strongly agree). This was followed by confidence in achieving good grades in mathematics (3.09, agree), the ability to solve mathematical problems (3.02, agree), and belief in possessing strong mathematical skills (2.94, agree). The lowest-rated item was students' perception of being more intelligent than peers in mathematics (2.61, agree), suggesting that while learners generally feel capable, they do not universally consider themselves the "best" in the subject. Overall, these results indicate that students maintain positive academic motivation and a constructive attitude toward mathematics, yet there is variability in perceived competence, likely influenced by prior experiences and personal interest in the subject.

The findings suggest that using competency sub-tasking enhanced students' self-efficacy by enabling incremental, achievable successes, thereby reinforcing confidence and fostering a sense of mastery. Strong agreement on peer-support tasks highlights not only individual self-belief but also the transfer of confidence into collaborative learning, promoting classroom engagement and collective problem-solving. However, moderate ratings on comparative competence suggest that students may cautiously evaluate their skills relative to peers, emphasizing the need for instructional strategies that provide mastery experiences, timely feedback, and self-reflective opportunities. Consistent with Taufiqurrahman and Hidayat (2022), self-efficacy is a significant predictor of mathematical problem-solving performance, suggesting that strengthening students' confidence, recognizing achievements, and promoting positive reinforcement can align self-beliefs with measurable academic outcomes. Consequently, competency sub-tasking emerges as an effective strategy for developing both cognitive skills and self-efficacy in mathematics, supporting enhanced learning, motivation, and peer-supported engagement.

4.3 Respondents' Academic Performance in the Second Quarter When Exposed to Competency Sub-Tasking

This section presents students' performance on the 40-item summative test administered in the second quarter, following their exposure to competency sub-tasking.

Table 5: Academic Performance Level of the Respondents When Exposed to Competency Sub-tasking

(n=154)

Level of Performance	Test Score Range	Frequency	Percentage	Level of Effectiveness
Outstanding	36 and above	0	0	-
Very Satisfactory	34-35	77	50	Proficient
Satisfactory	32-33	63	40.91	Approaching
Fairly Satisfactory	30-31	14	9.09	Developing
Did not meet the expectation	Below 30	0	0	-
Average Mean			86.16	Proficient

Legend: Outstanding – 90 – 100%; Very Satisfactory – 85% - 89% ;Satisfactory – 80% - 84%; Fairly Satisfactory – 75% - 79%

Did Not Meet Expectation – 75% and below

Table 5 presents the mathematics achievement of Grade 11 students, showing that 50% (77 students) attained a “Proficient” rating at the Very Satisfactory level, 40.91% (63 students) achieved “Approaching Proficiency,” and 9.09% (14 students) were at the “Developing” level. Notably, no students were classified as “Did Not Meet Expectations,” indicating that competency sub-tasking effectively supported all learners in mastering the assessed competencies. The concentration of students in the Proficient and Approaching Proficiency categories demonstrates that breaking down complex mathematical competencies into smaller, scaffolded tasks enhanced understanding, facilitated stepwise learning, and reinforced mastery across the cohort. The presence of a small group at the Developing level suggests that targeted reinforcement and differentiated instructional strategies may be necessary to ensure full proficiency for all learners.

The overall performance aligns with DepEd Order No. 73, s. 2012, which defines proficiency as the achievement of learning outcomes under the K to 12 curriculum. The mean score of 86.16% reflects a strong level of competence and suggests that competency sub-tasking not only benefits average learners but also enables higher achievers to excel. These results indicate that structured, incremental learning strategies can mitigate learning gaps, provide multiple opportunities for success, and promote positive learning outcomes. Consequently, competency sub-tasking emerges as an effective instructional approach for improving mathematics performance, supporting both learner confidence and mastery of essential competencies, while fostering equitable achievement across diverse student abilities.

4.4 Relationship Between Students’ Efficacy and Academic Performance When Exposed to Competency Sub-Tasking

To test the relationship between students’ efficacy and academic performance when exposed to competency-based sub-tasking in Mathematics 11, the Pearson correlation coefficient test is being used through a software application (Statistical Package for the Social Sciences).

Table 6: Test of Significant Relationship between the Students’ Self-efficacy and Academic Performance when Exposed to Competency Sub-tasking

(n=154)

Variables	N	Performance	p-value	Decision	Remarks
		Pearson r			
Students’ Self-efficacy	154	0.853	0.003	Reject Ho	Significant

*significant at $p < 0.05$

Table 6 indicates a statistically significant relationship between students' self-efficacy and academic performance when exposed to competency sub-tasking, as evidenced by a computed p-value of 0.003, which is below the 0.05 significance level. This result suggests that variations in students' self-beliefs are meaningfully associated with differences in their mathematics achievement. The finding confirms that students who reported higher confidence in their mathematical abilities tended to perform better academically, highlighting the critical role of psychological factors in shaping learning outcomes.

The results further emphasize the effectiveness of competency sub-tasking as an instructional strategy that positively influences both learners' self-perceptions and achievement. When instructional materials are tailored to students' needs and learning preferences, teachers can enhance engagement and support improved academic performance. This finding is consistent with prior research emphasizing the importance of well-designed instructional materials in enhancing the teaching-learning process and strengthening the relationship between pedagogical strategies and student performance (Amini, 2020; Ikram & Kenayathulla, 2023).

5. Conclusion and Recommendation

Based on this study's findings, competency sub-tasking is a practical instructional approach that enhances both self-efficacy and achievement in Mathematics among Grade 11 students. Based on the study's findings and conclusions, it is recommended that a learning enhancement plan be implemented.

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Conflict of Interest

The researchers confirm that there is no conflict of interest among individuals involved in this research.

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