

Assessment Tools and Gap Analysis on the Competencies Covered in Mathematics in Tupi Secondary High School

Apple Joy T. Zabala¹; Atty. Velessa Jane N. Dulin² (PhD)

Graduate School: Graduate School

^{1,2}Sultan Kudarat State University (SKSU); Sultan Kudarat State University (SKSU) Tacurong City, Philippines; Tacurong City Philippines

Publication Date: 2025/05/07

Abstract: This study provides a thorough examination of competency coverage in Mathematics at Tupi Secondary High School, with a particular focus on the effectiveness of assessment tools used in various classroom settings, including Science Technology and Engineering (STE) and heterogenous or Basic Education Program (BEP) sections. The research aims to evaluate how well these assessment tools align with the competencies mandated by the Department of Education while identifying gaps in competency coverage. Additionally, the study analyses the strategies teachers employ to address these gaps within the designated instructional time. This research utilizes a mixed-methods approach, employing an explanatory sequential research design. It incorporates document analysis and thematic analysis to evaluate the data. The researcher compares the competencies expected by the DepEd with those covered at Tupi Secondary High School through the assessment tools used by Mathematics teachers. Findings indicate that STE and BEP sections U-test result is 0 and 16, which implies that both programs were not in the acceptance region, however, this reveals significant discrepancies between the two groups. The study emphasizes the importance of thorough planning and sufficient instructional time in ensuring comprehensive competency coverage, noting that STE teachers performed better than their heterogenous sections. These outcomes highlight the need for targeted improvements in the heterogenous sections, particularly in addressing competency gaps and ensuring adequate instructional time to meet DepEd curriculum requirements. This research advocates for strategic interventions, enhanced teacher training, and more effective use of assessment tools to bridge the competency gap and improve overall student learning outcomes in Mathematics.

Keywords: *Assessment Tools, Competency Gaps, Mathematics Competencies.*

How to Cite: Apple Joy T. Zabala; Atty. Velessa Jane N. Dulin (2025). Assessment Tools and Gap Analysis on the Competencies Covered in Mathematics in Tupi Secondary High School. *International Journal of Innovative Science and Research Technology*, 10(4), 2625-2636. <https://doi.org/10.38124/ijisrt/25apr1888>

I. INTRODUCTION

Mathematics has long been regarded as an essential pillar of education, providing students with the analytical and problem-solving skills necessary for success in today's rapidly evolving, technology-driven environment. Nonetheless, the teaching and learning of Mathematics have encountered significant challenges in recent years, particularly in light of disruptions such as the COVID-19 pandemic. Educational institutions around the world, including here in the Philippines, have faced hurdles related to curriculum coverage, assessment tools, and the development of competencies. These challenges have raised concerns regarding the preparedness of students for their future academic and professional pursuits.

The challenges facing Mathematics education on a global scale are significant. The World Economic Forum has

indicated that students worldwide are consistently underperforming in Mathematics. International assessments, such as the Program for International Student Assessment (PISA), revealed that a considerable proportion of 15-year-olds do not meet the basic standards of mathematical proficiency (OECD, 2019).^[12] Furthermore, the United Nations Educational Scientific and Cultural Organization (UNESCO) reports that more than 617 million children and adolescents globally lack the ability to read or perform fundamental Mathematics, primarily due to insufficient access to quality education (UNESCO, 2020).^[15]

The situation in the Philippines is critical, as Mathematics education has consistently been identified as an area needing significant improvement. The Philippine Statistics Authority (PSA) reported that despite various efforts to enhance learning outcomes, students continue to underperform in Mathematics in National assessments such

as the National Achievement Test (NAT) and the Philippine Educational Placement Test (PEPT) (PSA, 2020).^[13] The Department of Education (DepEd) has acknowledged that gaps in students' mathematical competencies, particularly following the disruptions caused by the pandemic, have become more pronounced. A report from the Education Research Development Center (ERDC) further highlighted that many students face difficulties with basic Mathematics skills, which directly impacts their ability to understand more advanced concepts (ERDC, 2021).^[6] Additionally, the implementation of the Most Essential Learning Competencies (MELCs) by DepEd, which aims to address these gaps, has encountered challenges, especially in schools where there are inconsistencies in curriculum delivery (DepEd, 2021).^[5]

This study is underscored by the necessity to address the notable gaps in Mathematics competencies at Tupi Secondary High School. This issue has become particularly pressing due to disruptions caused by the pandemic and the subsequent transition to a new normal in the education system. As students encounter difficulties in meeting the competencies mandated by DepEd, it is imperative to evaluate the effectiveness of the assessment tools employed by the educators and to identify any discrepancies between the competencies covered in STE curricula and those in heterogeneous sections. The aims of this study include assessing the frequency and effectiveness of the assessment tools utilized by teachers, analyzing the differences in competency coverage between the two programs, identifying gaps between the required and the covered competencies, and investigating how educators manage to address uncovered competencies within constrained timeframes. By addressing these critical issues, this study seeks to provide actionable insights that can enhance curriculum delivery, strengthen teacher support, and ultimately improve student outcomes in Mathematics.

➤ Objectives

This study aimed to identify the assessment tools and analyzed the Mathematics assessment of Grade 7-10 classes of Tupi Secondary High School in terms of difficulty level and competencies covered.

• Specifically, this Study sought to Answer the Following:

- ✓ How often do teachers employ the assessment tools to cover the competencies required?
- ✓ Is there a significant difference in the competencies covered between STE and heterogeneous section?
- ✓ Is there a significant gap between the level of competencies required by DepEd and the competencies covered by the Tupi Secondary High School – Junior HS?
- ✓ How do teachers cope with the mathematics competencies when they are not covered within the required period?

II. METHODOLOGY

This part presents the research design, locale of the study, participants of the study, data gathering procedures, instruments, and the statistical treatment used for data

analysis. This describes the processes used to answer the problems of the study.

➤ Research Design

This research used mixed method – explanatory sequential research design. The explanatory sequential design in mixed research prioritizes the quantitative phase initially and then succeeded by the qualitative phase (Toyon, 2021).^[14] This approach allows the researcher to comprehensively understand the study by integrating quantitative or numerical data with in-depth qualitative insights. This study employed document analysis in education and thematic analysis. The researcher compares the competencies expected by the Department of Education (DepEd) and covered in Tupi secondary high school using document analysis for the assessments employed by Mathematics teachers. According to Corbin and Strauss (2008), document analysis like other qualitative research methodologies, necessitates the examination and interpretation of data in order to extract meaning, gain insight, and develop empirical knowledge.^[4] Furthermore, quarterly exams, TOS, DLL and class record of Mathematics teachers are the documents used in this study, the researcher also interviewed (2) two Mathematics teachers per year level to gather essential information and data, one from the homogenous section (STE) and one from the heterogeneous section (BEP) per grade level.

➤ Participants of the Study

The participants of this study were the Grade 7-10 Teachers of Tupi Secondary High School. The researcher selected two Mathematics Teachers from each grade level, one from STE, and another from BEP(heterogeneous) class. The researcher selected one teacher from each of the two programs of TNHS to show the contrast between the two sections since the STE program are perceived to be the fast learners while the BEP (heterogeneous) class belong to the average to low performing learners.

➤ Methods

• Document Analysis

To determine competencies covered by the mathematics teachers in JHS, the researcher examined/checked the DLL or Weekly Lesson Log, quarterly exam and its TOS to make sure that the three documents match with each other and the competencies needed, the division of South Cotabato has a unified exam for each grade level per quarter and it is aligned with the competencies in the K- 12 Mathematics curriculum. However, there are instances that the teachers create their own TOS and exam if they cannot cover all the required competencies or they exceed to the required MELCs competencies. All the documents needed for this study such as TOS, exam, class record, DLL was retrieved from the master teachers of the school since they are the one who collects all this from the teachers in their department and it is one of their functions as a master teacher in the department.

• Thematic Analysis

Thematic analysis is considered to be a method or a tool by some academics, such Boyatzis (1998) and Morse and Cheek (2021), but it is a technique in and of itself by

others.^[11] According to Braun & Clarke (2006), it is the first qualitative approach that should be studied since it offers fundamental abilities that are essential for carrying out many other types of analysis.^[3] The researcher used QDA software in organizing, coding, and analyzing the transcription/qualitative data of the study. This tool help the researcher to enhance the process of identifying the patterns and themes within the qualitative/unstructured data, thereby fostering collaboration and yielding valuable insights.

➤ *Qualitative Statistical Treatment*

To determine significant gaps, the researcher identify the competencies covered by each mathematics teachers (participants) in each quarter through examining the documents such as TOS, Exam and DLL. The documents collected/gathered from the Master Teachers of the Mathematics department of the school and not from the teacher. Through the data that was collected from the master teachers the researcher creates a table containing the checklist of the: competencies in MELCs, TOS, exam, and DLL. And after that the researcher used Mann-Whitney U test to determine if the average competencies covered by the teachers in the two programs has matched the standard. According to

Field, A. (2013) the Mann-Whitney U test is a non-parametric statistical method employed to compare two independent groups.[7] It is particularly useful for determining whether there is significant difference between these groups in terms of a continuous or ordinal variable that does not adhere to a normal distribution.

III. PRESENTATION AND DISCUSSION OF FINDINGS

In this chapter the results of the study are presented and discussed in relation to the aim of the study which was to determine how often do teachers employ assessment tools to cover the competencies required, the significant gap between the level of competencies required by Deped and the competencies covered by the Tupi Secondary High School Teachers in the homogenous and heterogenous sections of each grade level, and how do teachers cope with the mathematics competencies when they are not within the required period. The results of the investigation are analysed, presented, and interpreted in this chapter.

➤ *Assessment Tools to Cover Competencies Required*

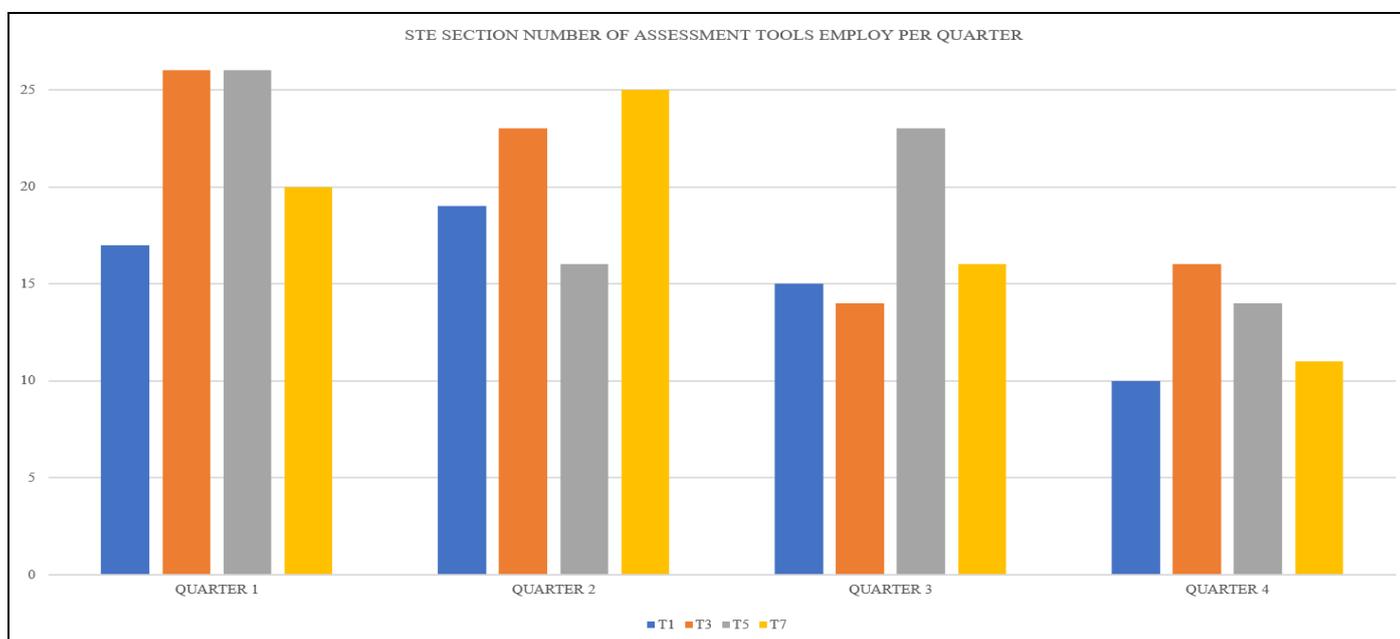


Fig 1 Column Graph Showing the Comparison of Assessment Tools Employed in STE Sections

Teachers employed assessment tools regularly in most sections, especially in STE sections (see figure 4), where the average usage per section remains quite consistent and frequent throughout the quarters. The figure above shows the number of assessment tools employed per quarter by Mathematics teachers in the STE and heterogenous sections. The STE sections (T1, T3, T5, T7), T1 had an average of 15 assessment tools employed per quarter, T3 have an average of 20 assessment tools employed per quarter, T5 had at least 20 assessment tools employed per quarter, and T7 had an average of 18 assessment tools employed per quarter. Generally, STE sections had a higher number of assessment tools employed each quarter compared to the heterogenous

sections (T2, T4, T6, T8), since, T2 have 0 assessment tools employed, T4 had an average of 6 assessment tools employed per quarter, T6 had an average 15 assessment tools employ per quarter, and T5 with 11 assessment tools per quarter. For STE sections, T3 and T5 had relatively high averages compared to others, with T3 being the highest.

In heterogenous sections (see figure 2 below), the usage is less consistent, with T2 not using any tools because the teacher did not use the prescribe competencies, while other sections like T6 and T8 have moderate usage, showing that the employment of assessment tools is a bit more varied in these classes.

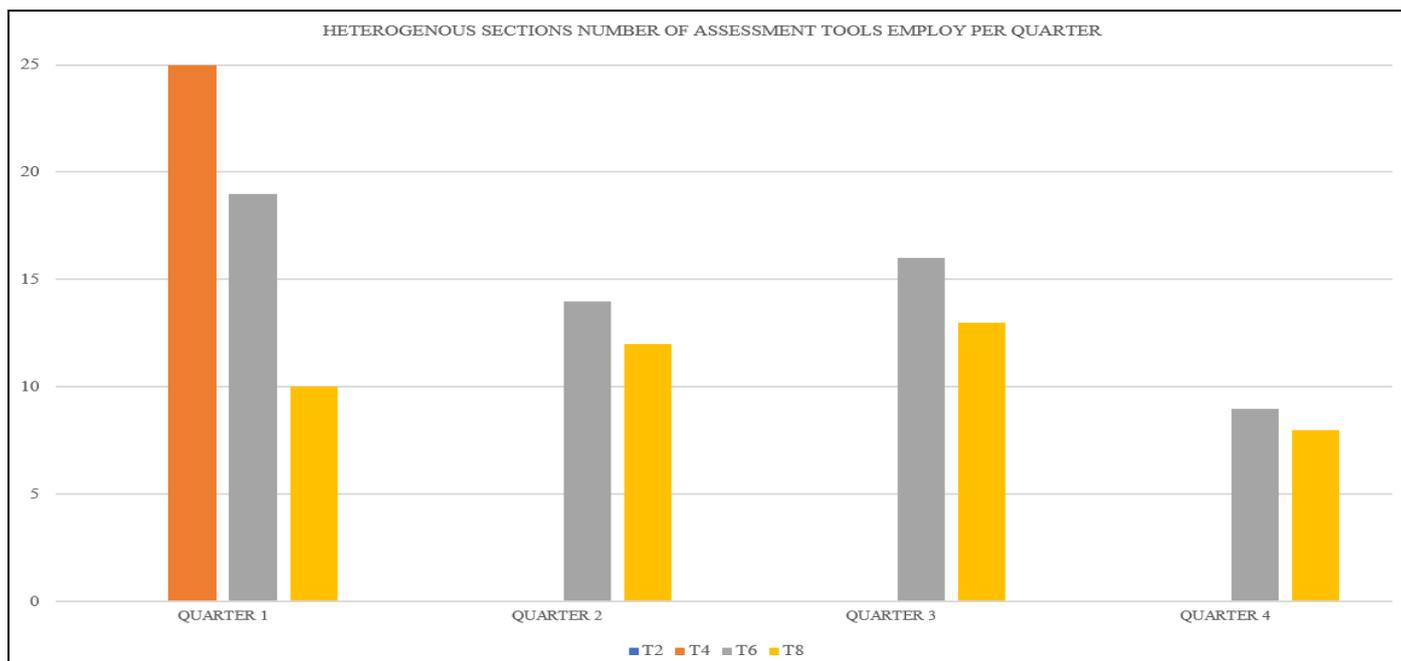


Fig 2 Column Graph Showing the Comparison of Assessment Tools Employed in Heterogenous/BEP Sections

The heterogenous sections, showed no assessments for T2 since according to the teacher participant that the curriculum or the most essential learning competencies are not followed because the teacher needs to reteach the basic fundamentals in Mathematics (elementary competencies) such as operations on fractions, whole numbers, decimals, integers and basic algebraic terms and expressions. T4, had only covered the quarter 1 competencies in terms of assessments, therefore, the remaining three quarters have 0 assessment tools. According to T4, she tackled the lessons in grade 6 subjects that is more on reading and real-life stories because most of the students are non-readers and slow readers. T6 and T8 participants had varied usage ranging from 0 to 25 assessment tools per quarter, with T6 seeing the most assessments on average for BEP sections, since T6 finished all the competencies required and the teacher followed the time frame set by DepEd regardless if the students understood the topic or not.

The effectiveness of teachers in implementing formative assessments is frequently associated with their prior experiences and the quality of the professional programs in which they engage. Research study published by Black, P., & William, D., (2018) underscores that educators who do not receive adequate training in assessment strategies are less likely to employ a diverse array of assessment methods in their teaching practices.^[2] In line with this, the heterogenous teachers in TNHS had not received adequate training in assessment strategies compare to the STE teachers. According to the teacher participant, BEP teachers had less opportunity to be sent to trainings and seminars compared to the teachers in STE sections, because school heads will always prioritize the teachers teaching the higher sections compared to the lower sections.

To mitigate the risk of student disengagement or adverse emotional reactions, teachers may opt to limit the

number of assessments they conduct. In relation to this, the heterogenous teachers in TNHS employed minimal assessments to BEP sections because according to T2 and T4, there were students who were non-readers, and slow readers, with this, teachers in BEP sections opted to limit the assessments they employed to students because, the teacher had to read the questions and translated it to Filipino so that students could understand and answer the questions. Additionally, teachers in lower sections had to focus on discussions of topics, reading examples and other activities that enhances the reading skills of students. Moreover, assessment is an ongoing process integral to effective teaching and learning, ensuring that students remain on track to achieve the necessary competencies. The frequency of assessments is tailored to a specific context, subject matter, and type of assessments employed and are frequently used in day-to-day lessons to monitor students' ongoing progress. These assessments help teachers adjust their instruction to address learning gaps.

➤ *There is a Significant Difference in the Competencies Covered Between STE and Heterogenous/BEP Sections*

The figure below shows the percentage of competencies covered by the Mathematics teachers from 1-100. The blue graph are the competencies covered by Grade 7 teachers in each quarter; orange graph are the competencies covered by grade 8 are all Mathematics teachers; gray graph are the competencies covered by the Grade 9 teachers; and yellow graph are the competencies covered by the grade 10 teachers. In the STE sections taught by T1, T3, T5, and T7, nearly all the competencies were covered while the heterogenous sections taught by T2, T4, T6, and T8 in the heterogenous (see fig. 4 below) or basic education program mostly did not meet the expected competencies and having 0% of competencies in Grade 7 heterogenous section from quarters 1 to 4.

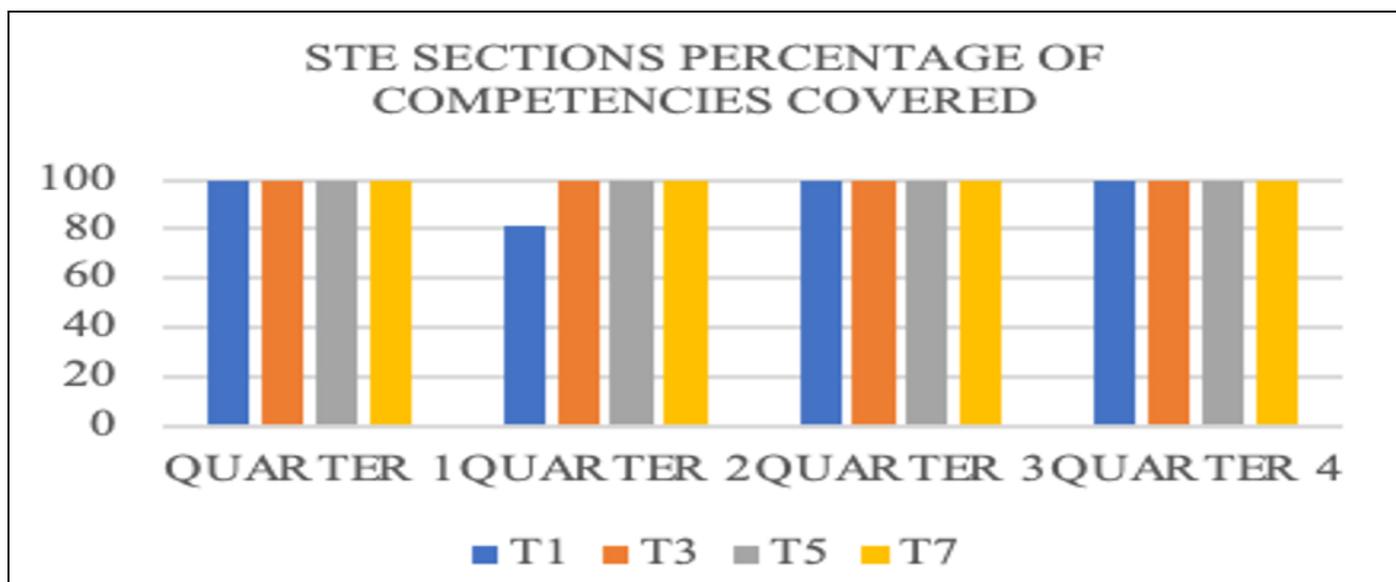


Fig 3 Percentage of Competencies Covered in STE Sections

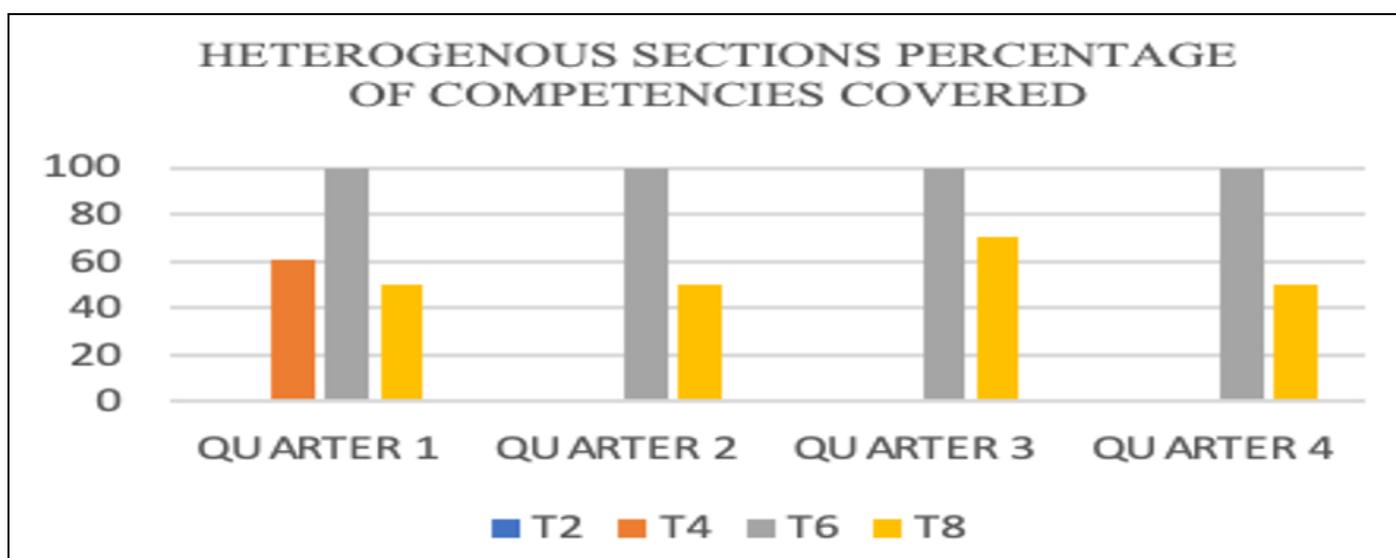


Fig 4 Percentage of Competencies Covered in Heterogenous Sections

In figure 4, T1 represents the teacher teaching Mathematics in STE classes in Grade 7 and it showed that the teacher covered all the competencies from quarter 1 and 4, while in quarter 2 and 4, the teacher did not cover 2-3 competencies. T2 represents the Mathematics teacher teaching Basic Education Program (BEP) classes in Grade 7. It clearly showed that there were no competencies covered based on the table and documents submitted by the teacher. T3 is a Mathematics teacher who teaches STE classes in Grade 8 and the table indicates that the teacher covered all the competencies from quarters 1 to 4 regardless of the time frame, however, according to the teacher in an interview, STE classes is more advanced in terms of lessons because the teacher has two hours per session to discuss each topic. T4 is a Mathematics teacher who teaches BEP (heterogenous) classes in Grade 8 and the teacher only covered 11 out of 18 competencies for quarter 1, however, in quarters 2-4, T4 did not cover all the most essential competencies. T4 stated in an interview that the students in the heterogenous sections needed to improve reading skills before learning the topics in

Mathematics 8. The teacher added that most students in heterogenous section are non-readers and slow readers so the teacher needed to go back to the topics in Grade 6 and taught more on stories to improve the students' reading skills. T5 teaches Mathematics 9 subject in STE program. According to an interview with the teacher, all the competencies in the MELCs were covered before the end of each quarter and he was able to advance the lessons for the next grade. T6 is a Mathematics teacher who teaches BEP sections in Grade 9, and competencies were all covered because according to the teacher participant, competencies should be covered in accordance to the timeframe set by the Department of Education regardless if the students can follow or understand the topics being discussed by the teacher, thus, the teacher will still proceed to the next topic/lesson even though few of the students can understand the topic/lesson. T7 is handling Grade 10 Mathematics subject in STE program. According to the document submitted, the teacher finished all the competencies because some of the competencies were already covered in the previous grade levels, hence, the teacher only

discussed the topics that were not taught in the previous grade levels. The teacher also added that he reintegrated the past topics in the present lessons so that students could review and connect it to the new lesson. The teacher also added advance lessons/topics to the STE program that is relevant to the next grade level or in preparation for their senior high school program. T8 teaches Mathematics 10 subject in heterogenous sections. The teacher covered 6 out of 12 competencies in quarter 1; 6 out of 12 competencies in quarter 2; 7 out of 10 competencies in quarter 3; and 3 out of 6 competencies in

quarter 4 respectively. The average competencies covered by T8 in Grade 10 MELCs is about 55%. Consequently, the teacher only selected the competencies to be covered that fitted the level of intelligence of the students in the heterogenous sections.

With the results of the competencies covered by the STE and heterogenous sections, the researcher computed the average competencies covered by each participant of the study in each grade level shown in table 1 below.

Table 1 Average Competencies Covered by Each Grade Level in Ste and Bep Sections on Mann Whitney U Test

Tupi Secondary High School		
	STE	BEP/Hetero
	n=4	n=4
Grade Level	Mean Rank	Mean Rank
G7	5	1
G8	7	2.5
G9	7	4
G10	7	2.5
Total	26	10
U-test Result	$U_1 = 0$	$U_2 = 16$
Note: * p<0.5	Upper limit =13.6811	Lower limit =2.3189

The average percentage of the competencies covered by the STE sections from Grades 7 to 10 was 98.75% while the heterogenous or BEP sections from Grade 7 to 10 has 76.25% of competencies covered. To evaluate the differences in competencies covered between the STE and BEP/heterogenous sections, the researcher employed a Mann-Whitney U test that serve as a valuable metric for assessing the differences these two groups in terms of their ranks (Field, A. (2013)).^[7] This statistical test is especially advantageous in working with small samples sizes or when data exhibits deviations for normality assumptions. Table 5 shows the ranks of each grade level of the two programs (STE and BEP), the computed test statistic using mean rank of STE was 0 while for the BEP section was 16 in which both the two programs is not in the acceptance region since the upper limit is 13.6811 and the lower limit is 2.3189.

The results reflected in table 1 indicated a significant difference in the competencies covered between the STE and heterogenous sections in Tupi secondary High School. It is evident that the performance and competencies of students in these two programs differ considerably. Hence, it would be beneficial to investigate the factors contributing to these differences, such as teaching methodologies, curriculum design, or other relevant variables.

➤ *There is a Significant Gap in the Competencies Covered Between STE and Heterogenous/BEP Sections*

The figures below show the percentage of competencies covered by the STE sections and heterogenous sections. The graph presents how wide is the gap between the level of competencies required by DepEd and the competencies covered by TNHS in each program, having 100 as the completely covered the DepEd competencies and 0 means no competencies covered.

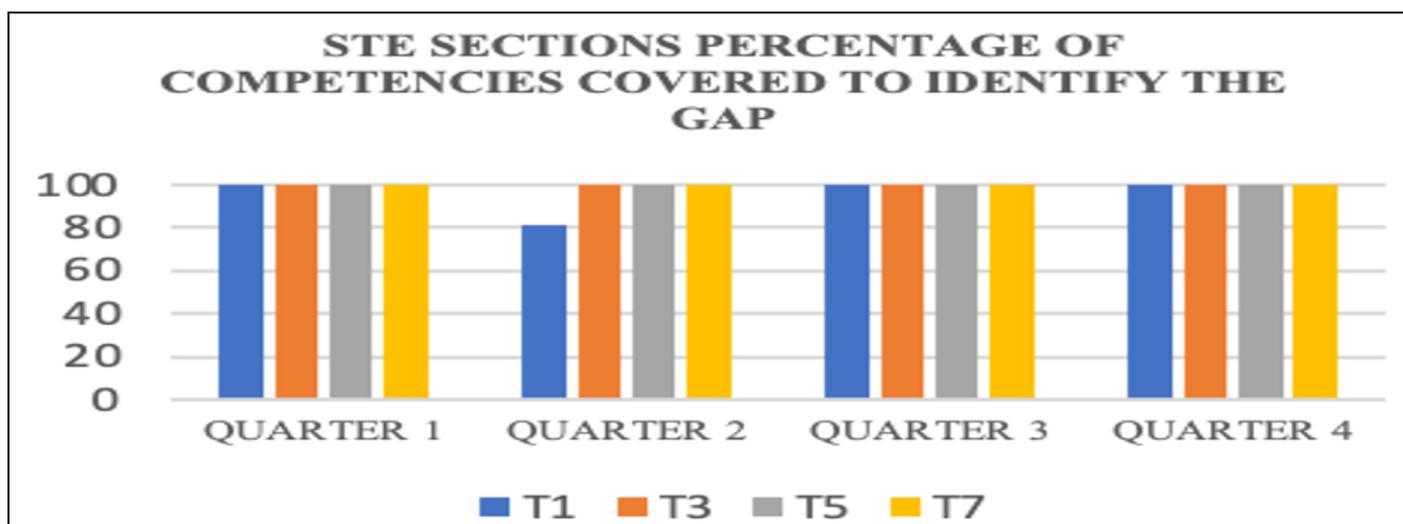


Fig 5 Percentage of Competencies Covered by STE Sections

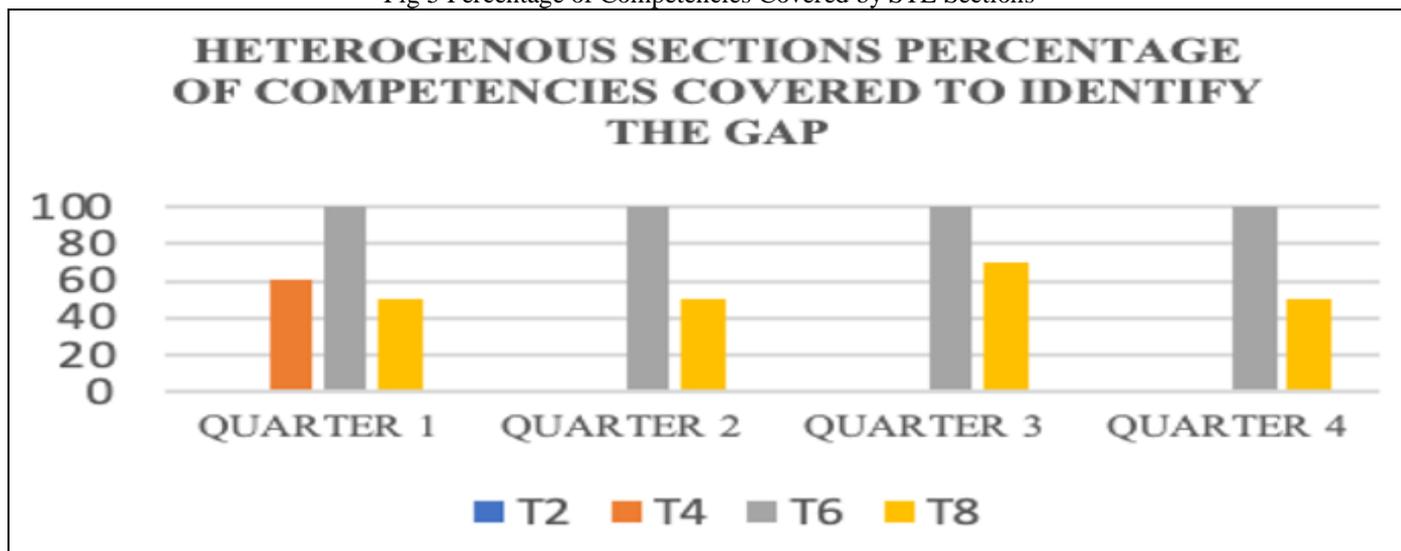


Fig 6 Percentage of Competencies Covered by Heterogenous Sections

The STE sections (T1, T3, T5, and T7) showed that the coverage has consistently demonstrated in a high level of alignment, approaching 100% across all quarters as seen in the graph above. This reflected a strong adherence to the competencies mandated by DepEd. For heterogenous sections (T2, T4, T6, and T8); T2 demonstrated a consistent lack of competency coverage, recording 0% across all four quarters. This indicated that TNHS Grade 7 did not cover any of the competency required for the Basic Education Program or hetero sections, which represented a significant gap in the curriculum. T4 exhibited low coverage levels in the first two quarters, with figures at 61% and 0%, respectively. Coverage improved to 78% in quarter 3, but subsequently fell back to 0% in quarter 4. This pattern highlighted inconsistent coverage and indicated notable gaps during specific time periods. T6 achieved comprehensive coverage with a consistent 100% across all quarters, thereby showing no gaps in this section. However, during an interview with the teacher participant (T6), the teacher stated that in order to cover all the required competencies the teacher should be mindful of the timeframe set by DepEd and whether the students understand the topic or not, the teacher will still proceed to the next topic to avoid the delay of the lessons. T8 presented a greater degree of variability, achieving 50% coverage in quarters 1, 2, and 4, with an increase to 78% in quarter 3. While the gaps are not as pronounced as those in T2 or T4, there remained some inconsistency in the coverage that warrants attention.

The Department of Education (DepEd) in the Philippines has implemented the K-12 curriculum to ensure that students develop essential competencies in core subjects, including Mathematics, Science, English, Filipino, and Values Education. This curriculum is clearly articulated through the K-12 learning standards and competency-based frameworks, which are designed to prepare students for both academic achievement and personal development, thereby enhancing their readiness to navigate the complexities of the modern world.

Tupi Secondary High School, as an educational institution, is obligated to comply with the guidelines established by the Department of Education (DepEd). The degree to which this compliance is effectively implemented in practice is influenced by several key factors. First, the professional training and capability of teachers to deliver the curriculum with efficacy; Second, the availability and quality of resources, including textbooks and instructional materials, that align with DepEd standards; Third, student factors, student readiness, backgrounds, and level of preparedness. Fourth and lastly, the assessment tools employed at TNHS to evaluate student competencies in accordance with the requirements set forth by DepEd.

Educators play a vital role in translating the competencies mandated by DepEd into effective teaching practices. It is essential that the teachers at TNHS receive comprehensive training on the latest curriculum updates and have access to professional development opportunities. Failing to provide such training may create a significant gap in instructional effectiveness, ultimately impacting students' educational experiences and outcomes.

The extent to which teachers are familiar with the DepEd curriculum guides or MELCs, learning materials, and assessment tools plays a crucial role in determining students' ability to meet the required competencies. Enhanced teacher knowledge of these resources directly contributes to improved student performance and achievement. To assess the presence of a significant gap between the competencies mandated by the Department of Education (DepEd) and those addressed by Tupi National High School, the researcher conducted a comparative analysis of the competencies outlined in each section across all quarters in order to identify the differences and areas for enhancement.

Moreover, there existed a notable gap/discrepancy between the competencies required by DepEd and those addressed by TNHS especially for T2, where no competencies were covered at all. Additionally, T4 revealed

significant gaps due to inconsistent coverage, which may adversely affect the overall learning experience. While T8 demonstrated some gaps, it was comparatively more consistent than T2 and T4. Conversely, the T1, T3, T5, and T7 participants exhibits minimal gaps, achieving close to 100% coverage across the quarters.

In summary, although TNHS STE section had consistently covered all the required competencies, the gaps identified in the inconsistent sections particularly in heterogenous or BEP sections suggested that some competencies required by DepEd are not being fully addressed or are inconsistently covered. Therefore, it is imperative to enhance coverage in the inconsistent sections to effectively bridge this gap.

➤ *The Emerging Themes if Mathematics Competencies were not Covered Within the Given Timeframe*

The researcher used thematic analysis to understand the ideas in the interview of the participants of the study, and present the identified themes from the data gathered providing detailed descriptions from the participants of the study while linking it to the research question of this study.

The researcher with the help of an expert used QDA software to identify themes and sub-themes of the study (see Table 2).

Table 2 Themes and Sub-Themes of the Study

Theme 1: CHALLENGES ENCOUNTERED	Theme 2: PREFERED NUMBER OF HOURS
Difficulties in Algebra	Time allotment in teaching Math
Not all competencies are covered	2-hours teaching hours is enough
Learners’ difficulties in understanding the concepts	2-hours teaching hours for STE is enough to cover the MELCs
MELCs competencies were not used	Theme 3: COMPETENCIES COVERED
Learner’s difficulties in reading and understanding the concept	Repetitive Competencies
1-hour for BEP learners is not enough to cover the MELCs	Competencies not neede to reteach
Non-readers	Added advance competencies for STE students
Cannot cope with the competencies	Need to learn the basics
Most students have difficulty in solving problems	Theme 4: APPROACHES
Exclude the difficult competencies for lower sections	Planning

There are four themes identified during the thematic analysis: Challenges encountered, preferred number of hours, competencies covered, and approaches. These themes delineate the various obstacles encountered by teachers teaching mathematics subject. The identification of these themes and sub-themes can illuminate areas for enhancement in instructional practices, curriculum development, and student support initiatives.

➤ *Emerging Theme 1: Challenges Encountered by Mathematics Teachers*

This theme provides an opportunity to examine the various difficulties teachers face and the subsequent impact these challenges have on the overall learning process. The sub-themes of Theme 1 are as follows:

Difficulties in Algebra - a substantial number of students in BEP sections exhibits challenges in the realm of Algebra, according to one participant (T1) *“mas nahihirapan ang mga bata doon sa Algebra especially sa special products and inequalities. Pag more on algebra mas nahihirapan ang mga bata magsolve.”*, it was also highlighted in the study of Hossain, K. M. (2020) that algebra presents significant challenges for students, as they often encounter difficulties with both conceptual understanding and problem-solving techniques.^[9] This situation underscores the necessity for either intensified focus on algebra instruction or the exploration of alternative methodologies for presenting the concept;

Inadequate Coverage of Competencies – this sub-theme indicated that time constraints or instructional limitations may hinder the comprehensive delivery of the curriculum,

potentially resulting in significant gaps in students learning processes. According to T8 *“not all competencies were covered, may mga naskip, because they cannot comprehend, nagabigay lng ako ng topic na medyo madali nila maintindihan”*. Mbagwu, J. U., & Egbe, O.S. (2024) also agreed that students encounter considerable challenges in their mathematics education, particularly in comprehending complex concepts and applying them proficiently.^[10] This situation highlights the difficulty of adequately addressing all required competencies within the curriculum. The teacher explains that when the topic is difficult, students could not comprehend and it takes a lot of time in order for them to understand which results to inadequate coverage of the competencies;

Learners struggles with conceptual understanding – this sub-theme showed that some students lack the foundational knowledge or essential abilities for comprehending mathematical principles. Consequently, there is a requisite for Mathematics teachers to modify their instructional strategies to effectively address these deficiencies;

Non-adherence to MELCs – according to an interview of the participant of the study (T2) *“most of the students struggles in reading and arithmetic so I did not use the competencies last year and when back to the basics especially in addition and multiplications as well as fractions. So basically, the competencies are not used.”* The participant explains that some of the students in BEP classes are non-readers or slow readers that is why it is hard for them to proceed to the next lessons of the grade level because students have a very low comprehension level. Thus, the most essential learning competencies is not consistently

implemented, which lead to the omission or inadequate addressing or critical learning objectives of the grade level;

Learners' Challenges in Reading and Comprehension – literacy is a pivotal factor in the acquisition of mathematical knowledge. Students who encountered difficulties in reading and comprehension may struggle with understanding complex word problems, instructional material or lessons in mathematics. According to T2 *“students are not good in reading, how much more in mathematics”*, T4 also added that most of the BEP students are not a good reader, *“when I am conducting examination, I am reading the questions and choices first and then translate it in tagalog para makuha nila yung sagot”*;

Insufficient Instruction Time for BEP learners – a duration of one hour appeared inadequate for mastering essential concepts, thus indicating a need for extended instructional time;

Implications of Poor Reading Skills – students who lack proficient reading skills are disadvantage particularly in math subject, where the ability to comprehend the language of problems is critical. According to T4 *“they are frustrated readers so I need to translate and explain to them in Filipino or bisaya to make them understand. Most of the students is Moro so I will translate it to maguindanaoan before they can understand the topic, so ganon, basic lang lahat ng turo”*;

Prevalence of Problem-Solving Challenges – Mathematics teachers need to emphasize the development of critical thinking and problem-solving competencies;

Exclusion of Difficult Competencies for Lower Sections (Heterogenous sections) – certain competencies are excessively advanced for less proficient learners. According to T4 *“the school recommended us to make the learners read more, that means we will tackle most of our lessons in grade 6 subjects which is parang mas maraming real life na stories and maraming pabasa”*. The study of Hamidi, F. A. (2022) agrees that integrating reading strategies like reading stories significantly enhances students' comprehension of mathematical concepts.^[8] This approach is particularly beneficial for those who encounter challenges with fundamental problem-solving skills. This observation suggests a requirement for differentiated curriculum tailored to align with students' existing levels of understanding.

➤ *Emerging Theme 2: Preferred Number of Hours*

This theme reflected the teachers' preferences regarding the time allotment for math instruction. Feedback from the teachers indicates that a 2-hour teaching per session is an effective timeframe for addressing the Most Essential Learning Competencies (MELCs) while fostering meaningful engagement in the learning process. Sufficiency for STE classes, for students within the STE program, 2-hour instructional sessions are considered adequate for comprehensively understanding the lessons and achieving the required competencies.

➤ *Emerging Theme 3: Competencies Covered*

This theme reflects on how various competencies are covered while taking into account the demands of students and the allotted teaching time.

Repetitive Competencies – certain competencies are reiterated throughout the curriculum. While this repetition may serve to reinforce learning, it also indicates a need for enhancement progression within the curriculum. For example, topics in Grade 7 like special products (quarter 2) are also present in Grade 8 curriculum quarter 1;

Competencies Needed Not to Reteach– some competencies are deemed to be mastered by students and thus do not require reteaching. This practice conserves valuable instructional time and allows for a more efficient learning process. According to T7, *“the advantage of teaching in the STE program is that, we have 2 hours of teaching mathematics subjects, therefore, after finishing the required competencies we can teach advanced lessons in general mathematics and pre-calculus”*. Reteaching previous competencies/topics requires extra time and effort for the teachers, hence, the time frame set by DepEd may be at stake;

Advanced competencies for STE classes – for students in STE sections, the introduction of more advanced topics/competencies can enrich their learning experience, offering deeper and more challenging educational opportunities. According to T3, *“2 hours per session or 8 hours a week can cover all the competencies for that week minsan sobra pa nga yung madiscuss ko sa kanila.”* Grade 9 STE teach (T5) also stated that *“I have added topics that I think will be of used to them especially they were in STE program so I have taught them in advance some of the lessons in Grade 10”*;

Need to Learn the Basics – for students who encountered difficulties, it is crucial to revisit and reinforce fundamental competencies to establish a strong foundational understanding. As stated by the Grade 8 teacher teaching heterogenous section that Grade 6 Math (basic Math) competencies were used instead of Grade 8 competencies because students need to learn the basics, students are incapable of reading and understanding simple problems, therefore mastering the fundamentals in Mathematics like how to add, subtract, divide, and multiply numbers and fractions is needed as well as solving simple problems in math.

➤ *Emerging Theme 4: Approaches*

This theme helped the researcher to investigate the application of diverse teaching strategies and methods in addressing specific challenges. Planning – effective lesson planning is a critical strategy that ensure all necessary competencies are addressed within the set timeframe. According to T7 who teaches Grade 10 STE sections *“planning ahead, like the strategy that I will be teaching advance statistics in grade 9 so, that actually gave me a lot of time to cover the competencies”*. The study of Akinwande, A. S. (2022) also agree that effective planning of active

learning strategies can significantly address students challenges in comprehending mathematical concepts and enhance their engagement, particularly in time-sensitive situations.^[1] This process also enables teachers to customize their teaching approaches to accommodate the varied needs of the learners, including those who face challenges such as limited reading skills or difficulties in Algebra.

The after examining thoroughly the transcription of the study it reveals that there were 4 emerging categories or themes. Red color stands for negative feedback and concerns of the mathematics teachers, like difficulties in Algebra, not all competencies are covered, learners' difficulties in understanding the concepts, MELCs competencies were not used, learners' difficulties in reading and understanding the concepts, 1-hour for BEP learners is not enough to cover the MELCs, non-readers, cannot cope with the competencies, most students have difficulty in solving problems. Blue color represents questions and curiosity of teachers, like to exclude the difficult competencies for lower sections and how to plan for the lessons to cover the competencies required. Green color represents positive feedback from the teachers during the interview, for an instance the time allotment in teaching mathematics in STE for 2 hours is enough to cover the MELCs, and the yellow color represents suggestions or recommendations of the teachers, like the elimination of repetitive competencies, competencies not needed to reteach, additional advanced competencies for STE and the need to learn the basics in math.

IV. RESULTS AND DISCUSSIONS

This section provides a comprehensive overview of the findings, conclusions, and recommendations derived from the study.

The study employed a mixed-method, explanatory-sequential research design, integrating both qualitative and quantitative approaches to evaluate the alignment of Mathematics competencies at Tupi Secondary High School with the Department of Education's (DepEd) Most Essential Learning Competencies (MELCs). The researcher involved a comprehensive document analysis of various materials, including quarterly examinations, Table of Specifications (TOS), Daily Lesson Log (DLL), and class records, to identify the competencies covered by Mathematics teachers from each Grade level – one from Science Technology and Engineering (STE) and one from the Basic Education Program (BEP). Data collection strategies included an analysis of teachers' documentation and the conduct of interviews, followed by statistical analysis utilizing the Mann-Whitney U test to discern differences between the two programs. Finally, the researcher used thematic analysis to know how teachers cope with the Mathematics competencies when they are not covered within the required period.

➤ *Assessment Tools to Cover Competencies Required*

- Teachers employ assessment tools regularly in most sections, especially in STE sections, where the average usage per section remained quite consistent and frequent

throughout the quarters.

- In heterogenous sections, the usage is less consistent, with T2 not using any tools because the teacher did not use the prescribed competencies, while other sections like for T6 and T8 had moderate usage of assessment tools, showing that the employment of assessment tools is a bit more varied in these classes.

The results indicated that assessment tools are utilized with regularity in specific sections; however, there is a clear need for enhanced consistency in their application across all sections. This consistency is essential to ensure a comprehensive coverage of competencies.

➤ *Data Reveals Significant Difference: After Gathering the Data and Calculating the Average Percentage of Competencies Covered by the Participants of the Study it Shows that:*

- The average percentage of the competencies covered by the STE sections from Grades 7 to 10 was 98.75% while the heterogenous or BEP sections from Grades 7 to 10 was 76.25% of competencies covered;
- In statistical analysis, the calculated U-test value of STE was 0 and for heterogenous sections was 16. The upper limit was 13.6811 and the lower limit was 2.3189 indicating a statistically significant difference between the two groups since the U value is outside the accepted region;
- This finding indicates a significant difference in the competencies covered between the STE and heterogenous sections in Tupi Secondary High School.

This finding underscores the importance of implementing targeted interventions to address the discrepancies in competency coverage across diverse groups of students. It is essential to ensure that all students are afforded equal opportunities to achieve the established learning objectives.

➤ *Data Reveals Significant Gap: There is a Significant Gap between the level of Competencies Required by DepEd and the Competencies Covered by TSHS:*

- STE sections had consistently covered all the required DepEd competencies;
- In heterogenous/BEP sections, there existed a notable discrepancy/gap between the competencies required by DepEd and those addressed by TSHS, where T2 has no competencies are covered at all;
- Additionally, T4 revealed significant gaps due to inconsistent coverage, which may adversely affect the overall learning experience. While T8 demonstrated some gaps, it is comparatively more consistent than T2 and T4.
- It is imperative to enhance coverage in the inconsistent sections to effectively bridge this gap.

To ensure that all students successfully meet the required learning outcomes, it is imperative to improve coverage in areas where inconsistencies exist. By addressing

these gaps, teachers can promote more equitable learning experiences across all sections.

➤ *Managing Mathematics Competencies When Not Covered Within the Given Timeframe:*

- STE teachers finished all the required DepEd competencies because they had proper planning and had enough time (2 hours) for Math subject;
- *For Heterogenous Sections:*
- ✓ T2 teaching Grade 7 students, the students had low level of comprehension and lack basic skills in math such as the basic operations of number (addition, subtraction, multiplication, division), fractions, and decimals, hence the teacher has to go back to the elementary topics.
- ✓ T4 teaching Grade 8, the Most Essential Learning Competencies were not used because it was not related to the topic that the teacher discussed and some of the students were non-readers.
- ✓ T6 finished all the required competencies because the teacher followed the time frame given by DepEd regardless if the students understood the topic or not.
- ✓ T8 participant followed the DepEd competencies, however, the teacher skipped some of the competencies that are difficult for the students to understand most especially in problem solving.

V. CONCLUSIONS

The following conclusions are based on the synthesized results of the document analysis, emerging themes, and participants experiences to cover the competencies required by DepEd.

➤ *Employment of Assessment Tools*

It is revealed that teachers consistently employed assessment tools particularly in STE sections, where the application of assessment tools remained uniform across the four quarters. In contrast, the utilization of these tools in heterogenous/BEP sections demonstrated greater variability. Specifically, T6 and T8 exhibited moderate usage, while T2 did not implement any assessment tools due to non-adherence to the prescribed competencies.

➤ *Competencies Covered between STE and BEP/Heterogenous Sections*

It is realized that STE sections had consistently fulfilled the competencies mandated by DepEd. Conversely, significant gaps were identified in BEP/heterogenous sections, particularly in T2, where no competencies were covered, and in T4, which demonstrated inconsistent competency coverage. Although T8 displayed fewer gaps, some inconsistencies were still noticed. It is imperative to address these deficiencies in heterogenous sections.

➤ *Coping with the Uncovered Competencies*

The findings emphasize the importance of implementing targeted interventions and flexible teaching strategies to ensure that all STE teachers had successfully

managed to cover all the required DepEd competencies, attributed to thorough planning and adequate time allocation. In heterogenous sections; T2 in Grade 7 encountered challenges due to students low comprehension levels and foundational skills, necessitating a review of elementary topics; T4 in Grade 8 experienced gaps resulting from the irrelevance of certain competencies to the current curriculum, compounded by the presence of non-readers among students; T6 in Grade 9 effectively covered all competencies, though this was achieved without ensuring comprehensive understanding of students; T8 in Grade 10 adhere to the DepEd competencies but opted to omit more complex topics, particularly in the area of problem-solving.

In summary, STE sections demonstrated superior performance in both competency coverage and the application of assessment tools, whereas heterogenous/BEP sections faced significant challenges and gaps, particularly in the areas of competency coverage and student comprehension. Addressing these issues is critical to enhancing educational outcomes.

RECOMMENDATIONS

➤ *Based on the Findings and Conclusions, the following Recommendations are Presented:*

- Department of Education may revise the Mathematics curriculum to address competency gaps, ensuring it remains adaptable to current educational landscape. Additionally, integrating remediation strategies may support students in catching up on essential skills and topics they may have missed.
- School Administrators may develop support programs for teachers who are experiencing competency gaps or facing challenges in the classroom. This may include offering one-on-one mentoring, fostering peer collaboration, and ensuring access to additional teaching resources. School heads or administrators may ensure that teachers have access to sufficient teaching materials, gadgets or technology, and resources that can help them to cover the required DepEd competencies, address the learning gaps, and enhance teachers' efficiency.
- Mathematics Teachers may consider and improve assessment methods to guarantee they are diverse, inclusive, and consistent with the competencies addressed in the curriculum. Moreover, they may consistently evaluate and modify their lesson plans to address skills/competencies that were not covered in earlier grades. This may involve re-examining basic concepts and building a framework for student learning.
- Students may participate in interactive learning methods like studying in groups, discussing with peers, and posing questions to understand challenging ideas or concepts. This may enhance their comprehension and boost performance. Student may ought to recognize the topics and skills that they may have overlooked or found difficult and seek for additional assistance or materials to bridge those gaps. Thus, creating a study plan/strategy that emphasizes mastering competencies for current grade level while also gearing up for the upcoming educational

challenges may help students in establishing a solid base for upcoming topics.

- Future Researchers may concentrate on identifying the most effective teaching methods to tackle competency gaps, particularly in the basic education program. Also, they may investigate on creative assessment tools and instructional strategies that cater to the evolving requirements of learners and teachers in the contemporary educational environment. May explore how teachers can adjust to changing curriculum requirements, evaluate student performance accurately, and maintain students' interest in a learning difficult concepts/topics in Mathematics.

ACKNOWLEDGMENT

I would like to extend my sincere gratitude to all individuals who contributed to the successful completion of this research study.

First and foremost, I wish to express my appreciation to my research advisor, Velessa Jane N. Dulin, for her unwavering support, insightful guidance, and invaluable expertise throughout this process. Her mentorship has significantly influenced the direction and quality of this study.

I am also thankful to the teachers and administrators of Tupi National High School for their cooperation and for granting me permission to conduct this research. Their engagement and willingness to participate were crucial in the collection of the necessary data. To Fortunato Bacus Jr, for being such a remarkable guide and supporter.

I would like to acknowledge the steadfast support of my husband, Cezar Ryan D. Aviles, my family, and friends. Their encouragement has been instrumental in helping me navigate challenges and stay focused on the objectives of this research.

Additionally, I wish to recognize all the participants who took the time to share their experiences and perspectives. Their contributions have enriched this study and played a vital role in its success.

Finally, I would like to thank God, for guiding me through various challenges. I remain committed to placing my trust in you as I look toward the future.

REFERENCES

- [1]. Akinwande, A. S. (2022). *Active learning strategies for an effective mathematics teaching and learning*. ERIC. <https://files.eric.ed.gov/fulltext/EJ1385531.pdf>
- [2]. Black, P., & Wiliam, D. (2018). Assessment and Classroom Learning: A Review of Research and Implications for Practice. *The International Journal of Educational Research*, 29(1), 21-31. Tandfonline.
- [3]. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in*

- Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- [4]. Corbin, J., & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (3rd ed.). SAGE Publications.
- [5]. Department of Education. (2021). *Basic education report 2021*. Department of Education. <https://www.deped.gov.ph>
- [6]. Education Research Development Center. (2021). *Challenges in mathematics education in the Philippines: An analysis of learning gaps and curriculum implementation*. Education Research Development Center.
- [7]. Field, A. (2013). *Discovering statistics using SPSS* (4th ed.). Sage Publications
- [8]. Hamidi, F. A. (2022). *Teaching mathematics based on integrating reading strategies and working memory in elementary school*. *Athens Journal of Sciences*, 9(3), 156-167. <https://www.athensjournals.gr/sciences/2022-5156-AJS-Hamidi-07.pdf>
- [9]. Hossain, K. M. (2020). *Difficulties that students face when learning algebraic problem solving*. *Universal Journal of Educational Research*, 8(11), 51
- [10]. Mbagwu, J. U., & Egbe, O. S. (2024). *Barriers and difficulties of students in the mathematics learning process in junior high schools*. *ResearchGate*. https://www.researchgate.net/publication/381286129_Barriers_and_Difficulties_of_Students_in_the_Mathematics_Learning_Process_in_Junior_High_Schools
- [11]. Morse, J. M., & Cheek, J. (2021). Making room for qualitatively-driven mixed-methods research. *Qualitative Health Research*, 31(6), 1063–1073. <https://doi.org/10.1177/1049732321990706>
- [12]. OECD. (2019). *PISA 2018 results (Volume I): What students know and can do*. OECD Publishing. <https://doi.org/10.1787/5f07c754-en>
- [13]. Philippine Statistics Authority. (2020). *Mathematics performance of students in the Philippines: Analysis of national assessments*. Philippine Statistics Authority.
- [14]. Toyon, M. A. S. (2021). Explanatory sequential design of mixed methods research: Phases and challenges. **International Journal of Research in Business and Social Science* (2147-4478)*, 10(5), 253–260. <https://doi.org/10.20525/ijrbs.v10i5.1262>
- [15]. United Nations Educational, Scientific and Cultural Organization. (2020). *Global education monitoring report: Inclusion and education – All means all*. UNESCO.