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Assessing the Higher-Order Thinking Skills (HOTS) in English for Grade 7 Students

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Abstract: *This study assessed the level of Higher-Order Thinking Skills (HOTS) in English among Grade 7 students at Taganito National High School in Claver District, Surigao del Norte. Using a quasi-experimental design, the research aimed to evaluate the effectiveness of teacher-developed intervention modules designed to improve students' skills in applying, analyzing, evaluating, and creating, based on Bloom's Revised Taxonomy. A 65-item pre-test was administered to 261 students to identify the least learned competencies. Results revealed significant gaps in 17 English competencies, particularly in higher-order cognitive domains.*

In response, 14 intervention modules were developed using the 4A's instructional model—Activity, Analysis, Abstraction, and Application—and were aligned with the MATATAG Curriculum. These modules underwent validation through expert review and pilot testing and were implemented during enhancement sessions. After the intervention, a post-test was administered to the same group of students.

Findings showed a marked improvement in the performance of learners across all competencies. Statistical analysis using the Wilcoxon Signed-Rank Test revealed a significant difference between pre- and post-test scores, confirming the effectiveness of the intervention. Additionally, the mean gain in scores supported substantial learning progress. The study concludes that integrating HOTS through structured and contextualized modules enhances students' critical and creative thinking abilities. It is recommended that similar approaches be adopted in other subject areas and grade levels, and that continuous professional development be provided for teachers to support the sustained integration of HOTS in classroom instruction.

Keywords: Higher-Order Thinking Skills, Bloom's Taxonomy, 4A's Instructional Model, English Modules, MATATAG Curriculum, Quasi-Experimental Design, Grade 7 Education

I. INTRODUCTION

In the 21st century, students need strong critical thinking abilities to navigate complex real-world situations. Modern classrooms emphasize the adoption of innovative teaching strategies, including the integration of Higher Order Thinking Skills (HOTS). HOTS enable students to move beyond rote memorization and encourage deeper understanding and practical application of knowledge. In English education, the implementation of HOTS is crucial, as English teachers are expected to design activities that promote reasoning, interpretation, synthesis, and innovation. Open-ended questions, real-world problem-solving tasks, and collaborative learning approaches are essential for fostering critical thinking.

However, the implementation of HOTS in English classrooms faces challenges, particularly in traditional teacher-centered settings. Teachers may struggle with limited resources, time constraints, or insufficient training in developing HOTS-based instruction. In such contexts, instructional materials often lack opportunities for learners to communicate, collaborate, and solve problems, which are vital for academic and future workplace success.

The Philippine educational curriculum emphasizes the importance of the "4Cs" of 21st-century skills: critical thinking, communication, collaboration, and creativity. This study aims to assess the level of higher-order thinking skills among Grade 7 students at Taganito National High School in the Claver District, Division of Surigao del Norte. The findings

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will be used to develop learning modules infused with HOTS-based activities, enhancing students' critical thinking abilities and supporting teachers in implementing student-centered, higher-order learning in English classrooms.

II. RESEARCH QUESTIONS

This study aimed to determine the level of higher-order thinking skills (HOTS) in English of the Grade 7 students at Taganito National High School before and after the implementation of the intervention materials in English (with HOTS). Specifically, it sought to answer the following questions:

What is the level of performance on higher-order thinking skills (HOTS) in English of the Grade 7 students based on their pre-test scores?

How are the Grade 7 English Modules (with HOTS components) designed, developed, evaluated, and implemented?

What is the level of performance on higher-order thinking skills (HOTS)in English of the Grade 7 students based on their post-test scores after implementing the Grade 7 English Modules (with HOTS components)?

Is there a significant difference between the pre-test and post-test scores in English of the Grade 7 students after implementing the intervention material?

Is there a significant main gain in the level of performance on higher-order thinking skills (HOTS) in English of the Grade 7 students, considering their pre-test and post-test results?

III. LITERATURE REVIEW

Bloom's Revised Taxonomy, updated by Anderson and Krathwohl (2001), serves as a critical framework for structuring cognitive learning into six hierarchical levels—Remember, Understand, Apply, Analyze, Evaluate, and Create—thus guiding educators toward fostering deeper student engagement and higher-order thinking (Soland, Hamilton, & Stecher, 2021). Its wide application across disciplines, such as clinical education, promotes not only knowledge retention but also critical reasoning and decision-making (Chowdhury et al., 2022).

The “Applying” level plays a vital role in bridging understanding and real-world implementation. However, studies indicate that many learning tasks remain focused here, often failing to push learners toward higher cognitive domains (Ukobizaba & Nizeyimana, 2021; Sapkota, 2022; Siregar & Harahap, 2023). The “Analyzing” level enhances critical thinking by encouraging students to deconstruct and interpret information. Yet, it remains underrepresented in assessments, limiting opportunities for intellectual growth (Tamelab et al., 2021; Ghosh et al., 2024). “Evaluating,” a higher-level process involving judgment and critique, is also often overlooked in testing practices. Research suggests the need for curriculum reform to embed evaluative thinking into learning and assessments (Wuntu, 2021; Manalo & Dacillo, 2023; Quines, 2022).

At the highest level, “Creating” emphasizes innovation and synthesis. Studies demonstrate the potential of leveraging AI and digital tools alongside Bloom’s framework to facilitate creative thinking in students (Elsayed, 2023; Elkins et al., 2024; Maity et al., 2024). Developing HOTS is essential for equipping students to address complex challenges. Instructional approaches such as problem-based and inquiry-based learning are particularly effective in this regard (Sulastri, Suryani, & Suparno, 2022). Integrating experiential learning also enhances students’ ability to apply knowledge in varied contexts (Tan, 2024).

However, assessments must align with instructional goals to fully develop HOTS. Traditional assessments that focus on rote memorization often neglect the purpose of fostering critical and creative thinking (Alqahtani & Alamer, 2022). Teacher readiness plays a central role in successful HOTS integration, particularly in subjects like history. Educators must possess both content mastery and pedagogical innovation to engage students effectively (Sulastri et al., 2022; Anis & Nasrul, 2021). Creative teaching methods have been linked to improved student problem-solving and inferential reasoning (Singh et al., 2020).

Thus, Bloom’s Revised Taxonomy and the integration of HOTS serve as foundational tools for nurturing analytical, evaluative, and creative learners. While current practices still tend to favor lower-order thinking, research strongly advocates for reformed teaching and assessment strategies that prioritize deeper cognitive engagement and 21st-century skill development.

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IV. RESEARCH METHODOLOGY

Research Design

This study utilized a **quasi-experimental design** with a **pre-test and post-test** approach to assess the higher-order thinking skills (HOTS) in English among Grade 7 students at Taganito National High School. The research aimed to determine the students' initial level of HOTS before the intervention and compare it with the results after the intervention. The intervention consisted of a series of English learning modules designed to enhance HOTS, focusing on analysis, evaluation, and creation categories in Bloom's Taxonomy of learning.

Respondent/Participants

The participants of this study were the Grade 7 students of Taganito National High School who were enrolled in English subjects during the School Year 2024–2025. According to the Learner Information System (LIS), there were 274 enrolled Grade 7 students; however, only 261 students were able to participate due to their availability during the administration of the pre-test.

The study employed both purposive and convenience sampling techniques. Purposive sampling was used to specifically target Grade 7 students enrolled in English, aligning with the study's objectives.

Meanwhile, convenience sampling was applied by including only those students who were present and available to take both the pre-test and post-test. This approach ensured that the data collected would be relevant and complete for analysis.

Table 1 shows the distribution of participants in terms of the sections and the number of learners who participated in the study.

Table 1. Distribution of Participants

Grade 7 Sections	Number of Learners who Participated
A	34
B	60
C	50
D	60
E	57
TOTAL	**261**

Instrument of the Study

This study utilized a 65-item multiple-choice pre-test and post-test designed to assess the level of higher-order thinking skills (HOTS) in English among Grade 7 students. Each item was aligned with specific Grade 7 English competencies outlined in the MATATAG Curriculum. The test covered 61 competencies, with each represented by one or more questions. To evaluate students' performance, raw scores were computed based on their responses per competency. For example, if two items were linked to a particular competency and most students answered both incorrectly, that competency was marked as a least learned area. These scores were then converted into percentage scores out of 100, using a 70% benchmark as the mastery level.

The test items were carefully crafted to assess four domains of HOTS: applying, analyzing, evaluating, and creating. For instance, an applying item required students to use correct verb tenses in new or unfamiliar contexts; an analyzing question asked learners to distinguish between fact and opinion in a given paragraph; an evaluating item presented conflicting viewpoints on a topic and required students to choose the most logical argument with justification; and a creating question involved composing a conclusion based on a given text scenario or crafting a relevant title that captures the theme and tone of a short passage. These types of questions ensured the assessment measured not just recall or understanding, but also students' ability to use English in more complex, meaningful, and critical ways.

Based on the pre-test results, 14 intervention modules were developed to address the identified least learned competencies and to further develop students' HOTS. Each module integrated tasks that required students to apply, analyze, evaluate, and create, following the 4A's instructional model (Activity, Analysis, Abstraction, Application)

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recommended in the DepEd Surigao del Norte Division ADM Framework and aligned with the MATATAG Curriculum Guide (2023). The modules were designed to promote engagement, deepen comprehension, support concept building, and encourage real-life application of knowledge. They underwent quality assurance review, pilot testing, and peer evaluation to ensure effectiveness. These modules were implemented during remediation and enhancement sessions, providing flexible, structured, and learner-centered experiences that fostered critical thinking and improved overall English proficiency.

Validation of the Instrument

The modules and test instruments were first validated through a formal request to the research adviser for initial review and revisions. Afterward, the materials were evaluated by three selected experts in the field of English education, instructional design, and curriculum development. Their comments, suggestions, and corrections were incorporated into the final drafts to ensure content validity, clarity, and alignment with the intended learning outcomes.

Procedure

This study prioritized the rights, safety, and well-being of the Grade 7 participants from Taganito National High School by observing basic ethical research practices appropriate for the school setting. Before the conduct of the study, permission was formally sought from the school head and the English subject teacher, and informed assent and consent were obtained from the students and their parents or guardians. The purpose of the study, procedures involved, and the voluntary nature of participation were clearly explained both verbally and in writing. Participants were assured that they could withdraw from the study at any point without consequence.

Confidentiality and anonymity were strictly maintained. Student names were not recorded in any published document, and individual responses were coded to ensure privacy. The data collected were used solely for academic purposes and stored securely by the researcher.

The data gathering process involved three key stages: pre-test, intervention, and post-test. The pre-test, a 65-item multiple-choice assessment based on the competencies of the MATATAG Curriculum, was administered to measure the students' initial level of Higher-Order Thinking Skills (HOTS) in English—specifically in the domains of applying, analyzing, evaluating, and creating. This test was conducted during regular English class hours with the cooperation of the subject teacher and the researcher, ensuring consistency in administration.

After analyzing the pre-test results to determine the least mastered competencies, the intervention phase followed. This phase included the implementation of 14 learning modules designed to enhance students' HOTS. Lessons were delivered over a set period, integrated into regular classroom instruction, with the teacher and researcher facilitating the sessions. Upon completion of the intervention, the same 65-item instrument was re-administered as a post-test to evaluate improvement in students' HOTS. The testing conditions were kept consistent with the pre-test to allow for accurate comparison. Efforts were made to maintain a stress-free and supportive environment during all assessments.

In addition, basic demographic information such as age, gender, and academic background was collected through a brief survey to support contextual analysis. All data were handled with integrity and stored in secure, password-protected files to maintain confidentiality. This study aimed to generate reliable insights into the development of higher-order thinking skills among Grade 7 learners in English while maintaining ethical standards throughout the research process.

Data Analysis

The following statistical tools were used to treat the data:

Mean and Standard Deviation. These tools were used to assess the average performance of the students in the pre-test and post-test for each higher-order thinking skill in English of the students in Taganito National High School.

Paired Sample t-test. This tool was used to evaluate whether the mean difference between the pre-test and post-test scores is statistically significant. It is appropriate because the same participants are tested twice (before and after the intervention).

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Cohen's d. This tool was used to measure the effect size, which indicates how large the difference between the pre-test and post-test scores is. A larger effect size suggests a more substantial impact of the intervention.

Ethical Consideration

Researchers made sure that ethical issues were strictly followed during the trial. Informed consent of every participant was obtained prior to their participation. For as much as the study's purpose, their voluntary involvement, and their freedom to withdraw at any time without punishment, they were completely informed. By keeping all gathered information in strict possession and assigning codes rather than actual names, anonymity and confidentiality were preserved. In the course of gathering the data, researchers also ensured none of the subjects underwent—physical, psychological, or emotional—any sort of injury.

V. RESULTS

This chapter presents the analysis and interpretation of the data gathered from the pre-test administered to Grade 7 students. It highlights their level of performance in English.

Table 2. Level of Performance on HOTS of the Grade 7 Students Based on their Pre-test Scores

Score Range	Number of Students N= 261	Percentage	Mean Score	Standard Deviation	Performance Level
49-65	51	19.54%	51.86	2.07	**Excellent**
33-48	102	39.08%	40.52	4.37	**Good**
17-32	90	34.48%	24.11	4.60	**Satisfactory**
1-16	18	6.90%	15.56	0.51	**Needs Improvement**

Table 3. Standard Guidelines in Designing, Developing, Evaluating, and Implementing Grade 7 English Modules with HOTS

Phase	Guideline Reference	Key Details
Design	4A's Model (DepEd Surigao del Norte ADM)	Structure includes Activity (engagement), Analysis (comprehension), Abstraction (concept building), Application (real-life use); integrates HOTS tasks.
	MATATAG Curriculum Guide (2023)	Modules are aligned with most essential learning competencies (MELCs), focusing on least learned HOTS-based areas.
Development	DepEd Order No. 001, s. 2022 (ADM Implementation Policy)	Emphasizes learner-centered, flexible, contextualized, and inclusive content development.
	K–12 Learning Material Development Guidelines	Ensures developmental appropriateness, alignment to curriculum, and promotion of 21st-century skills.
	Localization and Contextualization Framework	Activities are embedded with local culture and scenarios for relevance and deeper learning.
Evaluation	Learning Resource Management and Development System (LRMDS) QA Criteria	Modules are reviewed based on content quality, instructional design, technical quality, and usability.
	Pilot Testing and Peer Review	Involves subject experts, master teachers, and sample learners; feedback informs revisions for clarity and effectiveness.
Implementation	DepEd's Differentiated Instruction Framework	Modules are used for remediation, enhancement, or independent study, tailored to learner levels and contexts.
	Learning Continuity Plan (LCP)	Supports delivery in modular, blended, or face-to-face

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	Guidelines	modes; ensures continuous learning despite challenges.
	Monitoring and Evaluation Tools (M&E Forms, Formative Assessments)	Used to track learner progress, adjust teaching strategies, and document implementation success.

Table 4. Level of Performance on HOTS in English After Implementing the Intervention Material Based on Post-Test Scores

Post-test Score Range	**Number of students N= 261**	**Percentage**	**Mean Score**	**Standard Deviation**	**Performance level**
49-65	77	29.50%	55.65	4.27	Excellent
33-48	102	39.08%	41.48	4.87	Good
17-32	82	31.42%	25.67	4.17	Satisfactory
1-16	0	0	0	0	

Table 5. Significant Difference Between the Pre-test and Post-test Scores in English of the Grade 7 Students After Implementing the Intervention Material

Group		**N**	**W**	**p-value**	**Decision**	**Interpretation**
Grade 7	Pre-test - Post-test	261	0.000	<0.001	Reject Ho	There is a Significant Improvement after intervention

** if p value is <0.05 then there is a significant difference*

Table 6. Significant Mean Gain of the Grade 7 Students considering their Pre-test and Post-test Results

Variable	**Mean**	**Mean Gain**	**W**	**p-value**	**Interpretation**
Pre-test	35.4	5.3	0.000	<0.001	There is a Significant Improvement
Post test	40.7				

VI. DISCUSSION

The pre-test results showed that out of 262 Grade 7 students, only 51 achieved an excellent level, 102 were rated good, 90 were satisfactory, and 18 needed improvements in their higher-order thinking skills (HOTS) in English. The overall mean score was 35.4, revealing 17 least learned competencies related to HOTS.

To address these gaps, Grade 7 English Modules were developed using the 4A's instructional model (Activity, Analysis, Abstraction, Application), aligned with the MATATAG Curriculum. The modules targeted the 17 least learned competencies and focused on the cognitive domains of applying, analyzing, evaluating, and creating. Module development followed DepEd Order No. 001, s. 2022, and validation was done through peer review and pilot testing. The modules were used during remedial sessions with flexible delivery and regular monitoring.

The post-test results from 261 students showed improvement: 77 achieved an excellent level, 102 were good, 82 were satisfactory, and none remained in the needs improvement category. The mean score increased to 40.7, and all 61 english competencies reached the learned level. statistical analysis showed a significant difference between the pre-test and post-test scores (p-value = 0.001), confirming the effectiveness of the intervention. There was a mean gain of 5.3 points, with the average score increasing from 35.4 in the pre-test to 40.7 in the post-test.

VII. CONCLUSION

Before using the Grade 7 English Modules with HOTS, some students performed at an excellent level, many were good or satisfactory, while others needed improvement, with several competencies requiring attention. The Grade 7 English Modules with HOTS were designed using the 4A's instructional model, aligned with the MATATAG Curriculum and tailored to address identified learning gaps. After implementing the modules, most students improved to excellent and satisfactory performance levels; no student remained in the needs improvement category, and all competencies were

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achieved.A significant difference between the pre-test and post-test scores confirmed that the intervention effectively improved students' higher-order thinking skills in English.

The Grade 7 English Modules with HOTS proved to be effective instructional materials based on measurable learning gains. Finally, the research suggested regular conduct diagnostic assessments to identify least learned HOTS competencies early. Use the results to design timely, targeted interventions and instructional strategies that meet the specific cognitive needs of learners; Promote and enhance the use of the 4A's instructional model in designing learning modules. Ensure that instructional materials are aligned with the MATATAG Curriculum and DepEd's Alternative Delivery Mode (ADM) standards for structured, contextualized, and student-centered learning; Institutionalize the integration of HOTS-based modules in all subjects and grade levels. Embedding HOTS tasks in daily instruction fosters critical, analytical, and creative thinking consistently across the curriculum; Conduct capacity-building programs on the development and implementation of intervention materials focused on HOTS. Leverage the success of this study to replicate similar strategies in other learning areas; and invest in and support the large-scale development of research-based instructional materials that promote 21st-century skills. Encourage collaboration among teachers, school administrators, and resource developers to ensure sustainability and impact.

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