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FACTORS AFFECTING THE ACADEMIC PERFORMANCE OF SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) STUDENTS IN ORAL COMMUNICATION IN CONTEXT OF DISTRICT IX, LEGAZPI CITY DIVISION

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ABSTRACT

This research investigates the factors influencing oral communication abilities among STEM (Science, Technology, Engineering, and Mathematics) students, focusing on motivation, teacher roles, and classroom participation. The study aims to identify issues specific to the STEM domain and propose improvements to enhance students' communication proficiency. Employing a descriptive correlational methodology, the research reveals a substantial correlation between teacher-related qualities and academic performance, while school factors like inadequate speech laboratories and limited resources have a lesser impact. The study proposes an action plan advocating improved teaching approaches through seminars and workshops, emphasizing inquiry-based, active, and student-centered strategies, incorporating performance challenges and thought-provoking questions. The proposed initiative encourages teachers to adapt strategies based on student achievements, fostering systematic improvement in teaching quality, expected to positively impact academic progress. Furthermore, it suggests empowering teachers to impart knowledge and modify strategies dynamically, based on student performance. By focusing on this initiative, the research aims to provide insights for educators, administrators, and policymakers seeking to enhance STEM education and improve students' oral communication abilities. The findings and recommendations offer guidance for stakeholders committed to nurturing effective communication skills among STEM learners.

KEYWORDS: Academic performance, oral communication in context,related factors, and STEM.

1. INTRODUCTION

The academic success attained by students during their secondary schooling establishes critical groundwork to empower both continued education and professional readiness. Assessing and contrasting the scholastic performance of adolescent pupils enrolled across the Philippine schools relative to global peers may highlight strengths or weaknesses embedded within prevailing instructional approaches. Additionally, these comparative appraisals can indicate to administrators which academic domains may benefit most from strategic enhancements or realignment of resources.

Raising academic performance is vital for unlocking the potential of youth across the country. Evaluating how other school systems worldwide achieve better results can further inform targeted reforms. With targeted interventions, secondary school achievement can be boosted to expand opportunities for Filipino students.

Some theories highlight the need for teaching methods that develop practical and pedagogical viewpoints. These approaches see oral communication as a key communicative skill. Formal oral presentations are often used as a form of evaluation because strong oral communication abilities are recognized as essential for success both in professional settings and in academics. The goal is to take a pragmatic approach to teaching oral communication competencies that students can apply in real-world contexts.

Oral communication can help people acquire languages by facilitating language generation, language processing, and information absorption. Another theory looks at the idea of genre in oral communication, considering discourse organizing techniques and text types that are accepted in culture and society.

According to Armstead (2022), the influential linguist Noam Chomsky believes that the ability to acquire language is intrinsically hardwired in the human brain at birth. Chomsky coined the theoretical concept of a "language acquisition device" (LAD) to describe this innate neurological system that enables infants to rapidly pick up and process linguistic rules. He hypothesized that the LAD is an abstract cognitive subsystem, not tied to any single physical region of the brain that equips children with the necessary tools to derive complex meanings from the language they hear and begin constructing their own representations of their native tongue. The LAD encompasses the diverse array of underlying mental operations, still not fully understood, that facilitate children’s seamless language development during their first years of life. Though hypothetical in nature, Chomsky's LAD concept underscores his view that language acquisition must be an innately human trait.

Liu (2018) mentioned in her study that they investigated how Chinese university EFL learners, both high and low proficiency, performed on oral English tests while they were anxious about speaking the language and used different strategies. According to the findings, students with lower proficiency levels were noticeably more fearful of receiving a poor grade and speaking with others than students with higher proficiency levels. The study found that participants utilized message abandonment, nonverbal, meaning-negotiating, social affective, and fluency-oriented approaches

much less regularly than they employed message reduction and alteration, meaning-negotiating, and socially affective tactics.

It is unfortunate that despite spending a great deal of time on English language instruction, students' oral ability to speak English has not improved. Thus, teaching a foreign language, especially English, continues to be a major challenge - while it requires extensive time investment, the results are often ineffective.

Tan's study (2020), conducted in the Philippines, examined the effect of small group discussion on Filipino English Second Language (ESL) high school students' confidence in speaking English (oral communication self-efficacy) in Central Luzon. Self-efficacy refers to one's belief in their ability to complete a task. Tan states that self-efficacy is an important concept in education as one's attitudes toward learning activities are shaped by the immediate learning environment. In this study, thirty senior high school students from a public science-focused school participated. Using a quasi-experimental technique, the study tested whether small group discussion (compared to other teaching approaches) boosted students' self-belief and comfort in practicing and applying English verbal skills. The findings contribute to knowledge on effective instructional strategies for Filipino ESL students building oral communication capabilities.

Strong oral communication skills are vital for students in STEM fields. STEM was introduced in 2016 as part of the K to 12 program implementations under the Enhanced Basic Education Act of 2013. STEM is one of four fields of study offered starting in Grade 11, along with ABM, HUMSS, and GAS. The aim of the STEM strand is to equip students with advanced abilities and expertise in STEM disciplines to get them ready for further education and professions involving science, technology, engineering, and mathematics (Azardon, 2016). Subjects under the STEM strand include advanced classes in biology, chemistry, physics, calculus, research, and earth science among others. The developments of critical thinking and problem-solving abilities, as well as project-based learning, are prioritized (Ada et al., 2021).

According to a study by Reyes et al. (2021), the STEM strand has increased enrollments and interest in STEM degree programs in Philippines universities, although there are still challenges in resources and qualified teachers in some schools.

Overall, the STEM strand aims to strengthen expertise in technical fields critical for national development and drive more students to pursue higher education and careers in science and technology (SEI-DOST & UNESCO, 2016).

However, compared to students in other majors, research suggests STEM students have difficulties in humanities and communication courses. According to a study of US college students, majors in the social sciences and humanities received considerably higher grades in communication studies classes than STEM majors (Reilly et al., 2019).

In the Philippines, the Oral Communication in Context course was introduced to the senior high school curriculum to develop students' communication abilities. However, performance trends

indicate STEM students score lower in oral communication compared to their counterparts in other tracks (Buan, 2019). Qualitative data suggests STEM students have weaker confidence and more anxiety related to oral communication activities (Fuentes & Matias, 2019).

Various factors may influence STEM students' oral communication performance. A US study revealed STEM students tend to have lower motivation for communication courses, negatively impacting engagement and grades (Darby, 2020). Teaching methods and curricula misaligned with STEM learning preferences may also deter achievement. Furthermore, STEM-related expectations and stereotypes could affect student attitudes and self-efficacy (Young et al., 2019).

The Department of Education, Region V, administered a Regional achievement Test (RAT) for the School Year 2022-2023. It includes the Oral Communication in Context subject. On the RAT, District IX of the Legazpi City Division obtained a Mean Performance Level (MPL) of forty-five-point forty-five (45.45 %) percent. This result was below projections and contrary to the school's expectations for student academic performance. The discrepancy between the MPL and the students' real academic performance raises questions about the relevance of the relationship between academic achievement and performance outcomes, which supports the indicated finding.

Given the significance of oral communication abilities for aspiring STEM professionals, more investigation is required to identify the barriers preventing STEM students from performing well in this domain. By identifying specific challenges STEM learners face, educators can develop targeted interventions to support the development of these critical competencies. This study aims to explore these factors within the context of senior high school Filipino STEM students completing required Oral Communication courses.

Objectives of the Study

The main purpose of this study is to determine the factors affecting the academic performance of STEM students in Oral Communication in Context.

It specifically it aims to answer the following:

1. Determine the academic performance of STEM students in Oral Communication.
2. Identify the key factors affecting the academic performance of the STEM students along:
    a. Student;
    b. Teacher; and
    c. School-Related Factors.
3. Assess the significant relationship between the academic performance of the students and the factors affecting their performance.
4. Propose an intervention program to address the needs of the students.

Theoretical Framework

This study is grounded in three key theoretical frameworks that elucidate concepts and variables related to proposing an intervention program to enhance the academic performance of STEM students in Oral Communication in Context: Social Cognitive Theory by Albert Bandura; Expectancy-Value Theory by John Atkinson; and Attribution Theory by Fritz Heider. In addition,

with the fusion of these theories, the researcher proposed her new theory, which is called Integrated Motivation-Expectancy Model for STEM Achievement.

Albert Bandura created the Social Cognitive Theory, which focuses on the interactions between behavioral, personal, environmental, and cognitive factors that affect how people learn and behave. Its core principles include: (a) Reciprocal determinism - behavior, cognition, and environment all influence each other bidirectionally; (b) Observational learning - people can learn through observing others' behavior and the consequences; (c) Self-efficacy - an individual's belief in their own capabilities to execute a task or achieve a goal; and (d) Self-regulation - the process of controlling one's behavior through monitoring and goal setting. In the Philippine schools, this theory is applicable when increasing self efficacy by setting proximal goals, peer modeling, and mastery experiences improves student engagement and academic outcomes (Macalinao, 2022). Self regulatory strategies like planning and reflection can be embedded in lessons to strengthen Filipino students' learning and achievement (Cleofas, 2021). Social influences like parental involvement and positive peer pressure can enhance Filipino adolescents' motivation and class participation (King, 2022). Modeling resilient behavior through stories of Filipino heroes and leaders inspires students to persevere academically despite challenges. Collaborative learning provides positive peer reinforcement and builds collective efficacy among Filipino students (Bandalaria, 2021).

Overall, social cognitive theory highlights that Filipino students' learning is strengthened when social and environmental influences are leveraged to positively shape their self-beliefs, motivation, and self-regulation.

Expectancy-Value Theory posits that motivation is influenced by how much value is placed on a task and the expectation held about one's ability to successfully complete the task. This motivation theory was developed by John Atkinson in the 1960s.

Its core principles include: (a) expectancy - refers to beliefs about one's own competence and the anticipation of success or failure at a task. Higher expectancy yields greater persistence; (b) value - relates to how much importance or interest is attached to a task. Greater value increases motivation to put forth effort; and (c) motivation is optimized when both expectancy of success and value of the task are high.

It can be applied in the local setting by making academic tasks relevant to Filipino students' backgrounds increases perceived value, engagement, and achievement (King, 2022). Providing positive feedback and modeling can build Filipino students' academic expectancy beliefs, lowering their anxiety (Reyes, 2020). Contextualization techniques like mother-tongue teaching raise academic value and expectancy among indigenous Filipino students (Lopez, 2021). Teacher trainings on culturally responsive pedagogy enhance relevance and expectancy for marginalized students in the Philippines (Tiatco& Bonifacio, 2021). Group work and peer sharing increase task value and self-efficacy among low-performing Filipino students (Camello, 2019).

In summary, expectancy-value theory provides a model for improving Filipino student motivation and learning by adjusting classroom factors influencing their perceptions of competence and subjective task value.

Attribution Theory focuses on the perceived causes to which individuals attribute their successes and failures. This motivation theory was pioneered by Fritz Heider in the 1950s.

Its core principles include: (a) People explain outcomes by attributing them to internal or external factors, such as effort, ability, task difficulty, or luck; (b) These causal attributions influence reactions to success and failure, self-esteem, efficacy beliefs, and future expectancies; and (c) Adaptive attributions emphasize internal, changeable causes like effort rather than stable factors like luck.

Its applications for STEM Oral Communication interventions: (a) Identifying maladaptive attributions STEM students hold about poor oral communication performance can pinpoint targets for restructuring thinking (Laurente, 2019); (b) Reframing external, fixed attributions like blaming difficult course material to internal, unstable ones like insufficient effort promotes motivation and engagement (King, 2022); (c) Equipping STEM students with strategies to make self-serving attributions for oral communication setbacks prevents helpless reactions and builds resilience (Reyes, 2020); (d) Workshops training STEM students to attribute oral presentation failures to addressable causes like lack of practice rather than innate inability are beneficial (Macalinao, 2022); and (e) Shifting causal beliefs from ineffective ability attributions to changeable effort and strategy attributions enhances Filipino STEM students' oral communication and overall academic performance (Bandalaria, 2021).

In summary, attribution theory provides a framework for interventions that help Filipino STEM students make empowering explanations about the causes underlying their oral communication outcomes, driving motivation and achievement.

All three theories deal with cognitive, motivational, and behavioral aspects of learning and achievement. They emphasize personal beliefs about competence/control as key drivers of motivation and performance. Environmental influences are acknowledged as interacting with internal cognitions. Research based on these theories can inform practical interventions in education.

They differ, in a way, since Social Cognitive Theory highlights observational learning, self-efficacy and self-regulation, while Expectancy-Value Theory focuses on perceptions of expectancy for success and subjective task value, and Attribution Theory examines causal explanations made for achievement outcomes.

However, they all are relevant for STEM student academic performance factors since Social Cognitive Theory points to modeling STEM career skills, building STEM self-efficacy and equipping self-regulatory strategies, Expectancy Value Theory spotlights making STEM studies

relevant and heightening expectancy of success for students, and Attribution Theory identifies maladaptive causal attributions students make about poor STEM performance.

These theories also served as bases for coming up with an intervention program since Social Cognitive Theory suggests interventions incorporating peer modeling, goal setting, and self-monitoring to increase engagement, Expectancy Value Theory implies interventions that increase STEM relevance and provide encouragement to shape positive expectancy beliefs, and Attribution Theory recommends interventions restructuring causal attributions from fixed external to internal and changeable causes.

In summary, these three motivation theories provide overlapping as well as complementary lenses into cognitive and motivational processes influencing STEM students' academic achievement, offering research-backed insights for designing interventions.

Drawing from these theoretical frameworks, the researcher proposes a model in which the motivation, expectancies, and attributions of STEM students come together to influence their academic performance and perseverance. The Integrated Motivation-Expectancy Model for STEM Achievement is the name of this model.

Its key factors are: (a) Self-efficacy - Students' belief in their capability to succeed in STEM based on Bandura's Social Cognitive Theory. This impacts motivation and persistence; (b) Subject task value - How much students value STEM subjects based on Eccles' Expectancy-Value Theory. Their perceived importance and interest drives motivation; (c) Causal attributions - How students explain their academic successes and failures, based on Weiner's Attribution Theory dimensions (locus, stability, controllability). This affects future expectancies; (d) Academic goals - The goals students set based on self-efficacy and values shape their motivation and engagement; and (d) Context - The classroom and school environment influences expectancies, values, and attributions. Social persuasions and culture impact self-efficacy.

This integrated framework combines key elements of motivation, expectancy, and attribution theories to understand the multidimensional factors shaping STEM academic achievement. It aims to inform educational interventions.

One essential educational element that will help guarantee a student's successful future is oral communication in context. It serves as a basis for both lifetime learning and communication. The number of people who are unfamiliar with the terminology used to characterize the various components of literacy is startling. It is the process of expressing ideas through speech and is vital for conveying ideas and beliefs to others; therefore it plays a significant role in students' lives. As they can foster the growth of strong teams, innovation, and improved learning and employability prospects, effective oral communication skills are critical for students' academic achievement as well as their future professional possibilities. Effective oral communication in a professional situation is based on openness, comprehension, and trust. It can raise spirits, spur better work, and foster teamwork.

Students who work on improving their oral communication abilities might stand out from their counterparts in the workplace and become more adept at achieving their goals. To guarantee that students are prepared for 21st-century learning, best practices are not employed in education if these tools are not explicitly taught.

Given that senior high school students are soon transitioning to higher education and professional careers, it is crucial to determine the factors influencing their performance in oral communication courses. Identifying these factors will allow the development of targeted intervention programs that enhance senior high school students' oral communication skills.

Conceptual Paradigm

The respondents for this study were students currently enrolled in STEM (Science, Technology, Engineering, and Mathematics) programs at various public high schools in Legazpi City District IX during the 2023-2024 school year. The academic performance data for the STEM student respondents was obtained through official reports submitted to the schools. A formal letter was sent requesting access to the relevant academic records and data for the survey respondents. This enabled the researcher to collect and analyze the official oral communication grades and assessments for the sampled STEM students across the public high schools in Legazpi City District IX.

After collecting the academic performance data in oral communication courses, surveys were administered to the STEM students to identify factors influencing their achievement in this subject area. Weighted means were calculated for each influential factor to quantify the relative extent of its effect on oral communication academic performance. Additionally, Spearman rank correlation coefficient analysis was conducted to statistically assess the relationship between the identified factors and the students' grades and test scores in oral communication classes. Together, the weighted means and correlation coefficients enabled a data-driven evaluation of the factors most critical to the oral communication achievement of the surveyed students. The findings from the comprehensive survey provided crucial insights that directed the design of a targeted intervention program to enhance the oral communication skills and academic performance of STEM students.

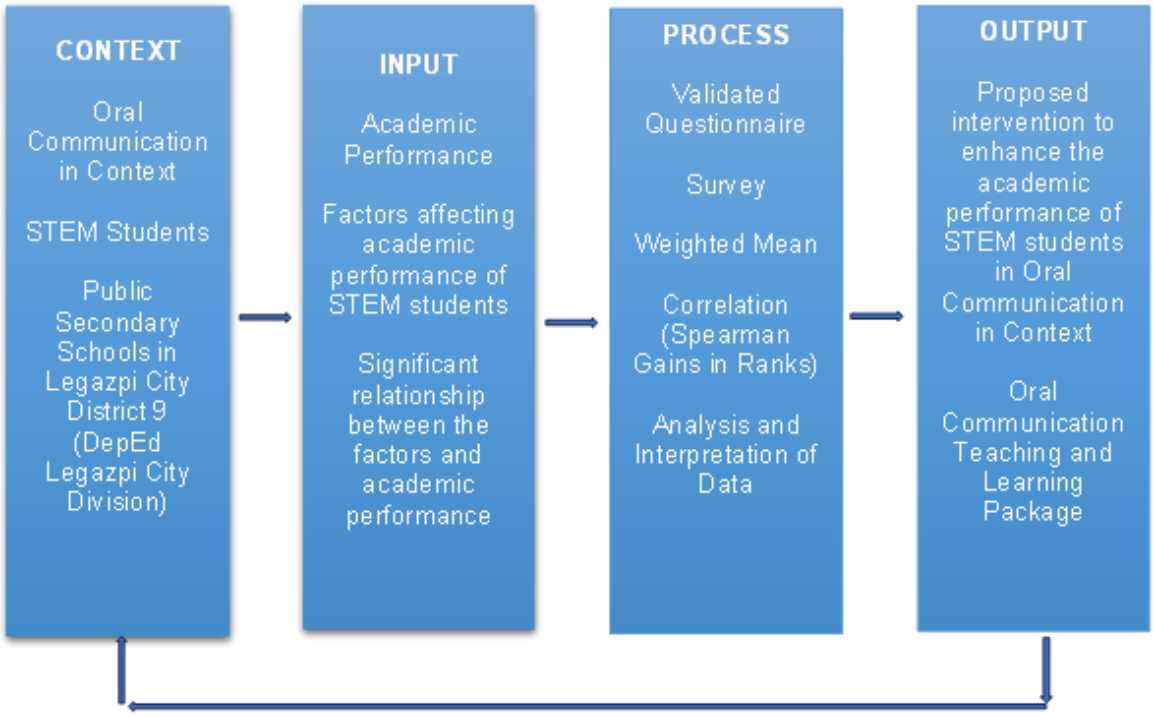

Figure 1. Conceptual Paradigm

2. METHODOLOGY

To achieve the research objectives, a quantitative type of research will be utilized, specifically correlation research design. Quantitative-correlational research aims to statistically examine relationships between multiple variables that the researcher does not directly manipulate or control (Curtis et al., 2016). It explores if changes in one variable are associated with changes in another variable. Quantitative-correlational research explores statistical relationships between variables measured using validated instruments. It provides insights on associations between factors but cannot determine causation on its own.

This study primarily utilized quantitative data collected through original research. A validated questionnaire was administered to identify factors impacting students' academic performance in Oral Communication across student, teacher, and school domains. The questionnaire used a Likert scale with parameters of Strongly Agree, Agree, Disagree and Strongly Disagree. It was developed based on indicators from the literature and aligned to the research objectives. The questionnaire underwent expert validation by teachers handling Oral Communication to enhance validity and reliability. Feedback from experts was incorporated to refine the questionnaire prior to administration. The questionnaire data was analyzed statistically to determine relationships between identified factors and student achievement in Oral Communication. This allowed differentiation of the significant factors correlated with academic performance. Moreover, expert feedback allows continuous refinement to the questionnaire to ensure it provides valid, reliable data aligned to the research objectives. Iterative improvements based on their input are key to producing a rigorous instrument.

The interpretation of data, using adjectival interpretation is shown below:

SCALE	QUANTIFICATION	ADJECTIVAL INTERPRETATION
4	3.50 – 4.49	Strongly Agree
3	2.50 – 3.49	Agree
2	1.50 – 2.49	Disagree
1	1.00 – 1.49	Strongly Disagree

Spearman Gains in Ranks. It is used to determine the correlation or relationship between ranked variables. In order to assess the data gathered and ascertain the significance of the correlation between academic performance and other variables influencing students' oral communication in context, a test of significance was employed in this study. The formula is:

$$P = 1 - \frac{6\Sigma G}{N_{2} - 1}$$

Where: 1 & 6 = constant
ΣG = summation of the Gains
N = no. of pairs
P = gains in ranks

3. RESULTS AND DISCUSSIONS

According to DepEd Order No. 8, s. 2015 titled "Policy Guidelines on Classroom Assessment for the K to 12 Basic Education Program," academic performance is composed of weight of the components for SHS which are the written works, performance task, and quarterly exam. Indeed, regardless of the curriculum implemented in schools, giving assessments in the classroom is essential for putting curriculum into practice effectively. It likewise allows teachers to track how well students are learning, identify gaps or issues in understanding, and adjust lesson plans accordingly to meet learning needs. Therefore, classroom assessment provides vital data enabling educators to monitor and enhance student progress on an ongoing basis.

The table shows the academic performance of STEM students across three public secondary schools in Legazpi City Division District IX. School A has 202 students, School B has 112, and School C has 26. The classification of academic performance is based on grades, with the frequency and ranking disclosed for each category.

The data indicates that among the 340 surveyed students from all three schools, 218 fall within the 91-94 grade range, with School A having the highest frequency and rank in this group.

Table 1. Academic Performance of STEM Students

	School A N=202		School B N=112		School C N=26			
Academic Performance	**f**	**Rank**	**f**	**Rank**	**f**	**Rank**	**Total**	**Rank**
95 & above	11	3	7	4	16	1	34	3
91-94	**157**	**1**	**52**	**1**	**9**	**2**	**218**	**1**
87-90	29	2	35	2	0		64	2
83-86	5	4	14	3	1	3	20	4
82 & below	0		4	5	0		4	5

Source: Field Survey (2023)

On the contrary, only four (4) students got a rating of 82 and below. The data showing most STEM students across the three schools scoring in the 91-94 grade range for Oral Communication implies most students can meet proficiency standards, but few are reaching more advanced skill levels.

According to Young et al. (2019), STEM programs often focus intensely on building students' quantitative and technical capacities, while interpersonal and communication competencies receive less formal development. As a result, students may become proficient yet struggle to excel in oral communication skills.

Targeted instruction and practice may be needed to enhance STEM students' oral communication performances to advanced levels. Haynes & Leonard (2010) found that adapting humanities instruction using examples and methods tailored for STEM contexts facilitated improved competency and self efficacy. Intensive courses focusing on public speaking, scientific discourse, debate, and presenting technical content could also extend proficient speakers to higher mastery (Keene et al., 2017).

The clustering of grades suggests that while foundational oral communication curriculum helps STEM students become verbally proficient, specialized programming may better challenge learners to build distinguished skill levels needed to convey complex technical knowledge and collaborate effectively in their future careers.

Factors impacting the academic performance of STEM students specifically in School A, B, and C.

The classifies factors affecting STEM students' academic performance into three groups: student-related factors, teacher-related factors, and school-related factors. Each indicator was evaluated based on its frequency (f) and weighted mean (WM), and the total weighted mean (WM) was used to come up with an adjectival interpretation.

The students pursuing STEM (Science, Technology, Engineering, and Mathematics) majors unanimously concurred that all of the listed elements have a genuine impact on their achievement in oral communication coursework.

According to students-related factors, the statement “I am satisfied with my performance in Oral Communication” got the highest WM (3.30) while the students “disagreed” to the statement “I have some difficulties in using the English language” with a WM of 2.43. The indicators in student-related factors have an average of 2.77. Within the domain of Teacher-Related Factors, most students agreed with the statement "The communicative activities help us interact in the subject Oral Communication in Context" (WM=3.10). Lastly, a weighted mean of 3.60 with adjectival interpretation of Strongly Agree, indicated that the lack of a speech laboratory is a factor that also affects their academic performance in the said subject, highlighting the importance of the learning environment in school-related factors.

The foregoing table shows that STEM students agreed that all factors indicated really affect their academic performance in Oral Communication.

According to students-related factors, the statement “I am satisfied with my performance in Oral Communication” got the highest WM (3.30) while the students “disagreed” to the statement “I have some difficulties in using the English language” with a WM of 2.43. The indicators in student-related factors have an average of 2.77. Within the domain of Teacher-Related Factors, most students agreed with the statement "The communicative activities help us interact in the subject Oral Communication in Context" (WM=3.10). Lastly, a weighted mean of 3.60 with adjectival interpretation of Strongly Agree, indicated that the lack of a speech laboratory is a factor that also affects their academic performance in the said subject, highlighting the importance of the learning environment in school-related factors.

Out of the three categories of factors examined - student-related, teacher related, and school-related - the school-associated factors received the highest total weighted mean rating of 3.31 from STEM students. This rating corresponds to an adjectival interpretation of "Agree," indicating students viewed school-related elements as having a pronounced influence on their academic performance in Oral Communication classes compared to the other two factors.

While there are some "Disagree" and "Strongly Agree" ratings for individual factors, the overall adjectival interpretation for the three broad categories of student-related, teacher-related, and school-related factors was "Agree.” This indicates that students viewed all three factors as generally having a positive influence on their academic performance, even though they may have disagreed or strongly agreed with specific factors within each category. The consistency in the overall adjectival interpretation suggests students see the combined impact of student, teacher, and school factors as beneficial, rather than attributing their academic performance to just one element.

Research shows that tailored instructional approaches, customized feedback models, and immersive language environments can powerfully shape oral communication skill development (Dyer et al.,

2018; Neville & Britt, 2007; Pascual et al., 2014). However, generalized education settings may not adequately provide these targeted supports.

As Poscente and Fruehwirth (2019) found, introductory humanities and liberal arts courses apply broad teaching strategies that fail to address key needs of STEM students. Students acknowledge the current environment enables proficient performance, but specialized programming could further enhance motivational and self-efficacy beliefs tied to higher oral competency.

The "agree" ratings imply that students, teachers, and schools supply an adequate but not ideal setting for markedly boosting STEM oral capacities. Implementing evidence-based instructional and institutional changes could transform an enabling context into one that proactively cultivates advanced verbal skills essential for future STEM careers.

The students in School B largely agree that all the described elements impact their academic performance in oral communication classes. These factors related to the students themselves, their teachers, and their overall school environment were all cited as contributors to their success rates in developing verbal expression abilities. Students' own limitations, like speaking anxiety and limited vocabulary, along with external issues like poor teaching methods and insufficient school resources, impact how well these students can understand and demonstrate oral communication skills.

Regarding student-related factors, the statement "I have some difficulties in using the English language" received the highest weighted mean rating of 2.88, which was interpreted as "Agree." This suggests students acknowledge facing challenges with using English themselves. For teacher-related factors, most students agreed with the statement "My teacher uses engaging performance tasks where students are able to communicate in the English language," implying the interactive methods used by teachers are viewed positively. Similar to School A, the unavailability of a speech laboratory received the highest rating of 3.62 interpreted as "Strongly Agree," highlighting this as a major school-related deficiency. Additionally, the lack of a prescribed textbook to be used in Oral Communication classes also earned a "Strongly Agree" interpretation with a weighted mean of 3.55. This indicates the absence of textbooks and speech labs are seen as noteworthy issues affecting academic performance. Of the three factors, it is also the school-related factors that got the highest WM of 3.39 interpreted as “Agree.” The data implies that aspects such as classroom environment, activities, textbooks, modules, and facilities play a substantial role in impacting STEM students' achievement in developing oral communication skills.

Although some individual factors received "Strongly Agree" ratings, particularly the lack of prescribed textbooks and unavailable speech laboratories, the aggregated adjectival interpretation across the three broad categories of student-related, teacher-related, and school-related factors was "Agree." This suggests that despite students strongly agreeing with certain specific factors, their overall view of the combined impact of factors related to students, teachers, and the school was positive, as indicated by the "Agree" interpretation. So, while deficiencies in textbooks and facilities stood out, the general consensus was that all three elements contribute in a beneficial way to academic performance. The weighted mean scores in the "agree" range for student, teacher, and school-related factors suggests these elements are perceived as moderately influencing STEM

students' academic performance in Oral Communication. This indicates that while the current learning environment enables students to develop foundational competencies, there are likely opportunities to optimize these factors to further enhance skills.

Research shows that implementing student-centered instructional approaches tailored to STEM learning styles can positively impact motivation and engagement in building oral abilities (Dyer et al., 2018). Providing customized feedback models aligned to technical applications of communication has also proven effective (Neville & Britt, 2007). Adjusting the curriculum to allow sufficient time for verbal practice has additionally benefited competency growth (Bhowmik et al., 2021).

The "agree" adjectival ratings imply students acknowledge the facilitating role of existing peer, teacher, and institutional conditions. However, based on best practices from the literature, strategically enhancing certain classroom, assessment, and whole-school elements could elevate STEM students' oral capacities to more advanced levels required for their future careers. Targeted improvements informed by learning needs hold promise for unleashing students' fullest potential.
Data on the factors affecting the academic performance of STEM students from School C.

The information shown in the table indicates that STEM students largely agree that the various factors highlighted, pertaining to students, teachers, and the school, play a role in their academic performance in Oral Communication classes.

Students disagreed with feeling anxious in their English class, as indicated by the weighted mean of 1.96. However, most agreed they were satisfied with their performance in Oral Communication. They strongly agreed that the communicative activities (WM=3.85) and performance tasks (WM=3.69) implemented by teachers helped them engage and interact in the subject. Students also strongly concurred that, teachers simplifying concepts and terminology aided their understanding of lessons (WM=3.73). Finally, mirroring the other schools, students strongly agreed that the lack of prescribed textbooks (WM=3.38) and a speech laboratory (WM=3.23) negatively impacted their academic achievement in Oral Communication.

Although five (5) individual factors received "Strongly Agree" ratings and two (2) factors were rated as "Disagree", the aggregated adjectival interpretation across the three high-level categories of student-related, teacher-related, and school-related factors was still "Agree."

Table 2: Summary of Factors Affecting the Academic Performance of the Three Respondents Schools

	School A		School B		School C		Average	Adjectival Interpretation
	WM	Adjectival Interpretation	WM	Adjectival Interpretation	WM	Adjectival Interpretation		
A. Student								
1. I feel anxious in my English class.	2.19	Disagree	2.51	Agree	1.96	Disagree	2.22	Disagree

2. I have good knowledge in English grammar.	2.97	Agree	2.66	Agree	3.00	Agree	2.88	Agree
3. I am satisfied with my performance in Oral Communicati on.	3.30	Agree	2.71	Agree	3.23	Agree	3.08	Agree
4. I have some difficulties in using the English language.	2.43	Disagree	2.88	Agree	2.42	Disagree	2.91	Agree
5. I can think critically and communicate effectively using the English language.	2.94	Agree	2.67	Agree	2.73	Agree	2.78	Agree
Average	**2.77**	**Agree**	**2.69**	**Agree**	**2.67**	**Agree**	**2.71**	**Agree**
B. Teacher								
1. My Teacher uses engaging performance tasks where students are able to communicate in the English language.	2.82	Agree	3.45	Agree	3.69	Strongly Agree	3.32	Agree
2. The communicativ e activities help us interact in the subject Oral Communication in Context.	3.10	Agree	3.32	Agree	3.85	Strongly Agree	3.42	Agree
3. My Teacher simplifies concepts and terminologies in the subject in order for the students to understand the lesson easily.	2.98	Agree	3.37	Agree	3.73	Strongly Agree	3.63	Agree

4. My Teacher strictly implements the use of the English language in class as the medium of instruction.	2.87	Agree	3.38	Agree	2.77	Agree	2.97	Agree
5. My teacher uses the facilitative art of questioning for higher order thinking skills.	2.81	Agree	2.68	Agree	3.16	Agree	2.88	Agree
Average	**2.92**	**Agree**	**3.22**	**Agree**	**3.44**	**Agree**	**3.19**	**Agree**
C. Teacher								
1. The classroom is conducive for learning.	3.19	Agree	3.23	Agree	3.45	Agree	3.29	Agree
2. The culminating activities enhance skills in oral communicatio n.	3.20	Agree	3.27	Agree	3.46	Agree	3.31	Agree
3. There is no prescribed textbook to be used.	3.46	Agree	3.55	Strongly Agree	3.38	Strongly Agree	3.30	Agree
4. The modules are very limited in scope and discussion.	3.10	Agree	3.27	Agree	3.00	Agree	3.12	Agree
5. There is no available speech laboratory.	3.60	Strongly Agree	3.62	Strongly Agree	3.23	Strongly Agree	3.48	Agree
Average	**3.31**	**Agree**	**3.39**	**Agree**	**3.30**	**Agree**	**3.33**	**Agree**

Source: Field Survey (2023)

Legend:

3.50 – 4.49	Strongly Agree
2.50 – 3.49	Agree
1.50 – 2.49	Disagree
1.00 – 1.49	Strongly Disagree

This indicates that despite some factors being viewed more positively or negatively, students' overall perspective on the combined influence of factors related to themselves, their teachers, and their school was neutral, as reflected in the "Agree" rating. The presence of “Strongly Agree” and “Disagree” ratings for specific factors did not skew the overarching view that all three elements contribute in a generally favorable way to learning outcomes. However, unlike the previous schools, in School C, the one that got the highest WM (3.44) with adjectival interpretation of “Agree” is Teacher-Related Factors. The weighted means in the “agree” range indicate students, teachers, and schools moderately facilitate STEM students’ development of oral communication competencies. However, there may be room to optimize these factors to further enhance academic capabilities.

Research demonstrates targeted instruction using methods suited for STEM learning styles promotes engagement and self-efficacy essential for growth in communication skills (Brown, 2010). Providing customized feedback tied to technical applications of language also deepens competency development (Neville & Britt, 2007). Fostering positive teacher-student rapport improves motivation and achievement outcomes as well (Sakiz et al., 2012).

While students agree their current environment empowers basic proficiency, strategically enhancing certain curricular, pedagogical, and relational elements could elevate capacities to mastery levels. Intensive oral communication programming tailored to STEM contexts shows strong potential to unlock students’ peak abilities needed for future career success (Dyer et al., 2018).

The “agree” ratings suggest supportive foundations exist across factors assessed. However, findings indicate targeted improvements informed by STEM learning needs could profoundly transform students’ oral communication skill trajectories. It can be noted, however, that unlike the previous schools, in School C, the one that got the highest WM (3.44) with adjectival interpretation of “Agree” is Teacher-Related Factors. This finding implies that students in School C perceive teacher-related elements as having the most significant influence on their academic performance in Oral Communication compared to student and school factors. This suggests teachers are potentially better leveraged as facilitators in School C versus the other schools.

Research indicates that teacher expertise, methods, feedback quality, and expectations profoundly shape student learning and motivational outcomes (Darby 2020; Wang &Degol 2016). Students recognizing teachers as the most impactful factor aligns to literature emphasizing educators' critical role in achievement.

The higher rating for School C teacher factors presents an opportunity to apply best practices that further empower teachers to elevate students' oral communication competencies. School leaders could provide targeted professional development on evidence-based strategies for STEM contexts, implement teacher mentoring programs, or foster professional learning communities focused on strengthening instructional quality and communication curriculum (Brigati & Ellis, 2021). Overall, the comparative finding highlights how School C has succeeded in establishing teachers as central in positively influencing students' oral skills and capacities. Sustaining this should remain a priority.

Table 2D presents the summary of findings regarding the factors affecting the academic performance of STEM students across the three (3) schools. It can be noted that all factors affecting the academic performance of STEM students, regardless of their school, received an "Agree" rating.

The consistent "Agree" ratings from students across all three (3) schools imply students perceive their peers, teachers, and schools are moderately enabling oral communication competency development. However, there may be missed opportunities to optimize these elements to further enhance academic performance and capacities.

Research shows targeted improvements in areas like customized curriculum, instructional approaches catered to STEM learner needs, assessment rubrics aligned to technical applications, and dedicated training for educators could amplify strengths in the existing environment (Dyer et al., 2018; Neville & Britt, 2007). Students acknowledge supportive conditions, but focused enhancements tailored to STEM contexts could unleash next-level oral communication abilities.

While positive that all key environmental factors are seen as facilitative to a decent degree, findings suggest current settings may emphasize baseline skill building versus advanced mastery. With oral competency critical for STEM careers, analysis indicates strategic elevations across peer, teacher, and institutional dimensions could profoundly shape both achievement outcomes and lifelong trajectories. Even supportive climates have potential for growth.

One goal of this research was to evaluate if there is a significant correlation between students' academic performance and the factors hypothesized to impact it. Table 3 displays the results of the analysis examining the relationship between grades and the student-related, teacher-related, and school-related factors.

Table 3 Significant Relationship between Academic Performance and the Factors Affecting the Academic Performance of STEM Students

Indicators	Computed t -Value	Tabulated t - Value at 5%	Remarks
1. Academic Performance and Student -Related Factors	.44	1.96	Ho=Accepted
2. Academic Performance and Teacher -Related Factors	1.97	1.96	Ho=Rejected
3. Academic Performance and School -Related Factors	0	1.96	Ho=Accepted

This table summarizes the statistical test outcomes assessing the connection between STEM students' academic achievement and the variables representing the factors that may influence their success. The objective was to determine the significance and direction of the association between performance and the student, teacher, and school factors based on the sample data.

The initial hypothesis was that there would be no significant correlation between STEM students' academic performance and the student-related, teacher related, and school-related factors. However, the tabulated results showed that the student-related ($p = 0.44$) and school-related ($p = 0$) factors had no statistically significant relationship with grades in Oral Communication. Only the teacher related factors ($p = 1.97$) demonstrated a significant link to student achievement. The results highlight the crucial role of teachers in nurturing communication skills, underscoring the need for specialized training and material support. As Ambubuyog et al. (2023) note, receptive language abilities require explicit instruction often neglected in STEM fields. Tailored pedagogical approaches maximizing aural and verbal engagement merit integration (Salapa, 2023).

Enhanced teacher capacity building programs focused on active listening strategies, multimedia integration and localized content creation seem prudent (Smidt et al., 2010; Lestary, 2019). Mentorships enabling collaborative development of contextualized lessons could boost adaptation (Coşkun et al., 2021). Upgrading instructor soft skills like empathy may also aid marginalized students (Blancaflor et al., 2021).

Conversely, sole reliance on high-tech tools without competency building risks ineffective technology integration (Alrawashdeh et al., 2017). So administrative support through research-based training and planning time is instrumental for impactful policies (Nagra, 2013). Appreciating educators' efforts to advance specialized skills also fosters motivation (Kluger &Itzchakov, 2022).

Partnerships with language experts and community stakeholders can provide complementary listening exposure (Bermillo et al., 2022). Multidisciplinary input would enrich teaching perspectives, potentially benefiting STEM soft skills development (Weger et al., 2020). Ultimately, communication mastery hinges on sustained collaborations elevating those directly shaping students' growth.

Thus, enhancing teacher-related factors emerges as a high-yield intervention area for STEM oral proficiency. Targeted up skilling and resource allocation must align with evidence-based strategies tailored to local youth learning styles and needs. A supportive culture of continuous improvement coupled with community co-creation can transform classrooms into dynamic listening labs preparing STEM graduates for twenty-first century demands.

Since there is a significant relationship between the academic performance of STEM students and their teachers, the researcher hereby proposed an intervention that aimed at enabling STEM teachers to effectively teach oral communication techniques utilizing interactive methods and provide tailored feedback.

With the proposed intervention, it is expected that (a) At least 90% of teachers report increased confidence and frequency in facilitating engaging oral presentation lessons using varied multimedia and interactive elements that yield over 75% student engagement based on attention span audits; (b) Trained teachers exhibit ability to identify each students' specific oral communication deficiencies and provide targeted coaching through reviews diagnosing issues in structure, word choice, visual integration or delivery and one-on-one mentoring sessions; and (c) 100% of teachers contribute to

building a modular oral presentation curriculum catalogue spanning grades and STEM topics containing flexible activities, rubrics accommodating beginner to advanced ranges and editable lecture slides.

The outcomes aim for teachers to gain measurable skills in promoting student engagement, delivering individualized training, and co-creating shareable curriculum materials to enable consistent oral communication instruction excellence.

4. CONCLUSIONS

Based on the findings, the following are the conclusions:

1. The data reveals that most surveyed STEM students across the three schools are high academic achievers, with 218 out of 340 students scoring between 9194 percent. On the contrary, only four (4) students got a rating of 82 and below, indicating an outstanding overall performance except for a small subset in need of targeted support.
2. The consistent "Agree" ratings given by students across all three schools suggest that, overall; students feel their peers, teachers, and school environments moderately support the development of their oral communication skills.
3. The results showed that only teacher-related factors had a statistically significant relationship with grades in Oral Communication, while student related and school-related factors did not. Specifically, student-related and school-related elements were found not to impact oral communication achievement, but qualities associated with teachers appeared related.
4. Given the identified factors impacting academic achievement of STEM students in public high schools, the proposed intervention program in the form of an action plan could help address these influencing elements.

5. RECOMMENDATIONS

Based on the foregoing findings and conclusion, the researcher recommends the following:

1. The survey data reveals a disproportionate number of students scoring in the 91-94 range compared to the few scorings 82 or below. This distribution indicates the need for targeted oral communication interventions and support for the lower scoring students. It is recommended that further analysis of the underlying factors influencing the scores in the 82 or below range be conducted through additional assessments and interviews.
2. The finding that students view peers, teachers, and schools as only moderately supportive of developing oral communication skills highlights the need for targeted programming to expand opportunities for skill-building. It is recommended that schools conduct an audit of existing resources, instructional practices, and extracurricular activities to identify gaps in oral communication support.
3. Since this study found that only teacher-related factors significantly influenced Oral Communication grades, while student and school factors did not, further research could examine why teacher characteristics seem to be more impactful. Additional investigation into the specific teacher qualities and instructional approaches that correlate with higher Oral Communication achievement is recommended.

4. Given the factors identified to impact STEM students' academic performance, especially teacher-related ones, it is recommended that public high schools conduct further research to identify context-specific challenges. This could involve surveys, focus groups, and interviews with STEM students and teachers to gather data on the most pressing needs and barriers in their school. Based on these findings, schools may design targeted intervention programs and action plans, utilizing evidence-based strategies, or may already use the proposed training design forwarded by this study.

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