Dimensions of English Language Learning Motivation of College Students – STEM Related Program in Region XI: An Exploratory – Sequential Approach

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ABSTRACT

This study explored the dimensions of English language learning motivation of college students – STEM-related programs in Region XI, particularly developed a measurement tool to measure college students' English language learning motivation. Through purposive sampling, the study participants were college students. The exploratory factor analysis (EFA) yielded six factors: effort, challenges, commitment, external support and influence, career and global relevance, self–regulation, intrinsic learning motivation, and English learning attitudes. The model was found to be the best fit using confirmatory factor analysis (CFA) and other tests of fit indices. The final questionnaire, the main output, had 56 items and was found to have good reliability based on its Cronbach's alpha. A descriptive survey also revealed that the level of English language learning motivation of college students – in STEM-related programs was high. Additionally, it was found that there is no significant difference between the level of English language learning motivation when grouped according to year level, program, and type of school. However, there is a significant difference between college students' English language learning motivation when grouped according to sex. Based on the results, the developed questionnaire will aid in determining the level of English language learning motivation of college students – STEM related which can be used in future planning, policymaking, and program implementations of different sectors.

Keywords: applied linguistics, education, dimensions, english language learning motivation, college students – stem related program, exploratory factor analysis, confirmatory factor analysis, Philippines

INTRODUCTION

To learn English more efficiently, learners require motivation to learn the language successfully. Motivation covers attitudes and affective conditions that influence the level of effort which is made by students in learning the English language (Alizadeh, 2016; Christianto and Karin, 2019; Nguyen, 2019). According to Flores et al. (2023), motivation is defined as a desire to acquire the language and favorable views concerning language acquisition. To put it another way, motivation to learn a second language is the extent to which a learner studies or seeks to learn a language out of desire and the gratification felt after making this effort. Effort alone cannot determine motivation. While an effort-expenditure person is not always motivated, a motivated person works towards the goal (Gardner, 1985). Sufficiently motivated students will develop into highly effective and adept language learners.

In Vietnam, according to a study by Nguyen (2019), despite undergoing at least three years of English language instruction, many Vietnamese high school dropouts still struggle with the language. For this reason, throughout the first two years of higher education, most Vietnamese institutions must offer additional English language support. However, employers frequently express dissatisfaction with graduates' inadequate English language skills. Vietnamese students' low English proficiency can be attributed to various problems. One possible explanation could be the learners' motivation for the English language. Moreover, according to Ugla's (2021) research, Iraqi students from different programs, like those in other Arab nations, struggle to use English for communicative purposes other than daily interactions or while speaking with visitors. Despite having spent years studying the target language—English—, Iraqi learners are still unable to communicate

appropriately in this language and are suffering to utilize English correctly. This problem could be related to their inability to be more motivated learners.

In the Philippines, in Zamboanga particularly, Flores et al. (2023), the research results revealed that the non-English language majors' respondents were highly motivated to learn English instrumentally and integratively —integrative motivation being the higher of the two motivational constructs. Furthermore, the results showed that all respondents, male or female, desired to be fluent in English to facilitate thought expression, communication, and social interaction—not with native speakers but with those in their immediate social circle, where English is a common language. However, also in Zamboanga, the context of Junior High School (Nuñez, 2021) revealed that the motivation of English language learning was instrumentally motivated. Moreover, Soriano et al. (2021) revealed in their study among college students from different courses that factors such as the classroom environment, parental influence, teacher influence, enjoyment of learning, and desire to learn all impacted students' motivation to learn English.

The researcher collected an inventory of scales and measurement tools about English Learning motivation as a second language and as a foreign language; however, none of them specifically address the English language learning motivation of Science and Technology, Engineering, and Mathematics (STEM) program students or related in college level or college students. Additionally, the researcher found a minimal tool, specifically in STEM-related programs at the college level.

Despite the extensive research on English language learning motivation, a significant gap remains in understanding the specific dimensions of English language learning motivation among college students – STEM-related Program in Region XI. Most studies have focused on general student populations or specific national contexts, but a lack of targeted research addresses the unique motivational challenges and dimensions undergraduate students face. Given undergraduate students' diverse cultural and educational backgrounds, it is crucial to explore their experiences regarding their English language learning motivation comprehensively. This study aims to fill this gap by employing an exploratory-sequential approach to identify and analyze the distinct dimensions of English language learning motivation among college students – STEM-related Program in Region XI. Doing so seeks to provide deeper insights and more effective strategies to enhance English language learning motivation in this specific academic and regional context.

Worldview and Theoretical Lens

This study employed pragmatism as its philosophical underpinning since it focuses on the English language learning motivation. It also investigated the dimensions of English Language Learning Motivation (ELLM). Pragmatism is concerned with actions, situations, and outcomes. This also emphasizes the research problem and awareness of the problem (Kaushik and Walsh, 2019). Recognizing the issues surrounding English language learning motivation, additional research about it will lead to practical solutions to issues concerning communication skills. It will also provide research-based ideas or strategies for developing students' English language learning motivation in English language communication. In addition, variables in this study were grouped during the supplemental quantitative research to assess whether there is a significant difference in the level of English language learning motivation. There were nine selected schools in Region XI, one in each province involved in this study.

Furthermore, it is easier for college students in STEM-related programs to participate in talks. Also, with the demand for using English as a medium of communication, improving students' English language learning motivation would be essential. This compelled the researcher to explore college students – STEM-related programs and English language learning motivation experiences. With this, the researcher intends to develop a tool for assessing college students – STEM-related program English language learning motivation.

The study is anchored on the original Theory of Achievement Motivation, defined as two uncorrelated objectives in accomplishment settings (Atkinson and Feather, 1966): the goal to succeed and succeed without failing. It is claimed that the first objective would satisfy the desire for achievement, while the second would satisfy the need to prevent failure. In the 1980s and 90s (Duda, 2005; Elliot and McGregor, 2001; Pintrich and Schunk, 2002), accomplishment goal-orientation theory replaced the theory of achievement motivation.

In addition, Gardner's Socio-Educational Model is fundamental to language learning motivation research. It highlights how crucial social and cultural elements are to language acquisition. Integrative Motivation—the desire to acquire a language to integrate into the target language group—is one of the essential elements. Instrumental Motivation—the drive to acquire a language to advance professionally or for other practical reasons—is another essential element.

Furthermore, Deci and Ryan's Self-Determination Theory (2000) states that meeting basic human needs for autonomy, competence, and relatedness is one of the primary variables affecting motivated behavior. Unlike many theories of motivation that focus on the quantity of motivation (e.g., goal-setting theory), SDT emphasizes the idea that quality variations in motivation also matter. SDT makes explicitly a significant addition by describing a continuum along which objectives may be pursued for various reasons, from extrinsic motivation at one end of the range to intrinsic motivation at the other. According to the hypothesis, all these many reasons could motivate people to action, but their effects on output and well-being might differ.

Furthermore, the L2 Motivational Self System of Dörnyei. Dörnyei, according to Zoltán, built on earlier theories and introduced the L2 Motivational Self System, which consists of three primary parts: Ideal L2 Self: The idealized self-perception of a second language learner. Ought-to L2 Self: The qualities one feels one should have to live up to expectations and prevent unfavorable consequences. L2 Learning Experience: The context-specific motivations about the current learning context and encounter.

Conceptual Framework

The study employed mixed-method research, particularly an exploratory sequential design, combining qualitative and quantitative research. The qualitative strand was conducted first through an in-depth interview (IDI) and focus group discussion (FGD) employing phenomenology. The qualitative strand was employed to explore postgraduate students' English language learning motivation.

Purpose of the Study

This study explored the dimensions of English language learning motivation of college students – STEM-related Program in Region XI. Using an exploratory sequential research design, this study aimed to develop a measurement scale containing the dimensions of ELLM of college students in the STEM-related program in Region XI. This research approach was utilized to gather relevant and supplementary facts. The ELLM dimensions of the college students Program were thoroughly studied through data gathering via In-Depth Interviews (IDI) and Focus Group Discussion (FGD). This qualitative phase was performed employing thematic analysis. The generated themes were then used to create a checklist administered to the college students – STEM-related Program in Region XI as part of the quantitative phase and as the study's primary outcome.

English Language Learning Motivation

The most common definition of motivation is "the degree to which the individual works or strives to learn the language because of a desire to do so and the satisfaction experienced in this activity" (Gardner, 1985, p. 10, as cited by Wang et al., 2022). According to Mili and Maniruzzaman (2020), action and motivation are related concepts. Motivation plays a significant role in second language acquisition, influencing language learners' success. Motivation, though, can be helpful while learning a second language. A student can only perform or acquire a language with motivation, and objectives become evident when there is motivation. Although learning English is highly challenging, learners can succeed if they have a natural motivation to do so. Learners have internal or external desires stimulating their interest in learning a foreign language to accomplish a task. As noted by Park (2017), there has been an increasing amount of study on motivation in second language acquisition, as it is a critical component of successful second language learning.

Motivation is a well-known factor that has a significant role in the success of learning a language (Wallace, 2020; Lee and Lin, 2022). Long-term learning success depends on motivation, especially for young learners. Higher success is ultimately the result of more motivated students being more involved in the learning process.

Additionally, Qingqing (2021) asserts that the additional expectations placed on language learners without the proper motivation may cause them to lose focus during the learning process and even result in relatively high dropout rates.

In the study of Brima and Abdetaly (2023) in Libya, they discovered that learning English affected students' motivation significantly. They suggested that by aligning language instruction to students' passions and goals, offering them chances to participate in extracurricular language-related activities like language clubs or cultural events could improve motivation. Additionally, introducing elements of the target language culture can pique students' curiosity and promote integrative motivation. Using real-world, pertinent, and exciting materials may stimulate students' attention and encourage intrinsic motivation. That is why it is important to provide realistic and exciting learning resources.

Similarly, adult learners must comprehend the significance of learning, according to Unson and Lambenicio (2022), and as a result, adults are motivated internally. If they want to learn, they will. For instance, a solid internal motivation effectively responds to the "what is in it for me" question. Additionally, low motivation, low self-esteem, anxiety, introversion, and inhibition are all factors that can cause mental blocks that limit the use of comprehensible input for learning.

Students often believed that teachers were the ones responsible for demotivation. However, Vakilifard et al. argued that (2020) teachers' performance, behavior, and instructional strategies—as well as how the course materials are presented—all play a role in demotivation. Moreover, learning a foreign language is only a course that must be completed; the overemphasis on specific topics and competencies and the scarcity of opportunities to practice speaking the language are other factors that demotivate students. Insufficient and inappropriate materials and equipment in the classroom can give learners the impression that they are wasting their time and not accomplishing anything, and if left unassessed, demotivation would significantly impact students to learn a foreign language.

Equally, Seven (2020) also mentioned that teaching students to be motivated to learn, especially the English language, is one of the best qualities of a teacher. Why do learners lack motivation? Is it a lack of parental support, packed classrooms, negative attitudes, disinterest, or subpar academic performance? According to some psychologists, (1) learners who make mistakes will inevitably fail or face humiliation. (2) When their positive actions go unappreciated and unrewarded. (3) When individuals grow weary of being judged and compared to others their age. (4) When they are utterly consumed with their issues.

Additionally, according to Muth and Lüftenegger (2024), motivational processes are essential to all facets of education and are a critical prerequisite for lifelong learning. This ability is crucial in our dynamic world. These transition processes might benefit from a strong desire to learn, particularly when it comes to adjusting to new and sustainable technology or lifestyles. Motivation is traditionally divided into two categories: extrinsic motivation, where the learner aims to achieve a specific goal independent of learning, and intrinsic motivation, where learning is pursued for the learner's intrinsic interest and delight. Higher levels of intrinsic motivation have been linked to a variety of positive outcomes, including increased energy for action, engagement, persistence, well-being, and even improved academic performance, according to a large body of research and meta-analyses.

According to Ugla (2021), motivating students to acquire and utilize English is crucial while learning a foreign language (FL). Motivation is a key component of learning the target language. Horwitz (1990) and Gardner (2007) defined motivation as a learner's attitude toward a particular language and the culture of the group that uses it. Learning and broad usage of a foreign language are essential for learners; with motivation, students can learn and acquire the target language.

In addition, Gardner's socio-educational paradigm pointed out that integrative and intrinsic motivation are related concepts. Both integrative and intrinsic motivation refers to "positive attitudes towards the learning situation and the learning process," as Noels, Clement, and Pelletier (1999) have noted (p. 31). Thus, Husna and Martini (2019) state that integrative motivation is crucial in creating a more stimulating learning environment and influencing students' attitudes.

When someone responds to achieve self-satisfaction, they are motivated by intrinsic factors (Dornyei, 2001). The learner would be learning English because they are interested in it, and no one has asked them to. It originates internally; an individual may be driven by a desire to feel better about themselves or by the thrill of learning itself (Brown, 2007). Therefore, intrinsic motivation is the desire that arises within an individual to exert effort towards achieving their objective. When they do, students will enter the classroom with a positive attitude and a liking for the process of learning.

The study by Husna and Martini (2019) found that while extrinsic and intrinsic motivation are high, the extrinsic motivating level is higher among students who took English as a course. This finding demonstrated that learners' motivation for learning English is vital, coming from internal and external sources.

However, the study of Takahashi (2018) revealed that motivation among students in Rwanda is mainly focused on praise, with intrinsic, future-oriented, anxiety-based, and unwillingness-based motivation following. While future-focused and unwillingness-based motivation—both of which can be classified as extrinsic motivation—declines with age, intrinsic and praise-oriented motivation grows stronger. According to the study, primary school learners' high unwillingness-based motivation can be the reason behind a decline in extrinsic motivation. At the same time, praise may be an explanatory factor for increased intrinsic motivation.

Similarly, Ugla (2021) conducted among undergraduate students from computer sciences, chemical, and biology departments and tested their motivation towards learning English. It was revealed that most participants from various academic backgrounds were driven to learn English for practical purposes. However, some of them had integrative motivation. The result demonstrates that most non-departmental (non-English speaking) students do not consider English a communication tool with others worldwide. Nonetheless, they concentrate on helping with homework and other tasks associated with their subject of study. As a result, since participants focus more on reading and writing and less on speaking activities, the favored English language learning activities could be more meaningful - connected to their instrumental motivation.

The study's overall conclusions of Sudirman, Junaid, and Gon (2022) revealed that most students are motivated to learn English integrative ways. The result suggests that students learn English depending on their interest in understanding and expanding their knowledge of English culture. The researcher also concludes that students' ambition or desire to accomplish a predetermined objective determines their motivation to learn English. One of the main reasons students learn English is to be able to communicate in the language, even though they may only sometimes fully acquire the language necessary for a successful career. It is supported by Wimolmas (2013), Redzuan et al. (2014), Poompanom (2016), and Beregovska (2023), stating that most students are motivated to learn English primarily for practical purposes. Most students said that learning English will help them pass their classes and have more employment options in the future. Moreover, learners prefer interactive activities like role-playing and problem-based learning when studying English.

On the same matter, Dang, Lee, and Ha (2021) mention that every student has encountered parental expectations while learning English among first-year college students in the university. As a result, parents' encouragement, support, and insightful guidance in studying English enabled them to become motivated students; thus, parents were crucial in encouraging their learners to learn English.

According to Ekiz (2016) and Soriano et al. (2021), family is where learning starts. Therefore, parents have received much attention in general education as a significant socially relevant factor that affects kids' inspiration and success (Butler, 2015). Above all, the data presented by Cheung and Pomerantz showed that parent-oriented inspiration was a brand-new kind of inspiration distinct from both intrinsic and external inspirations and that it amply illustrated the positive effects of parental involvement on children's success.

Similarly, Dang et al. (2021) also discovered that teachers impacted learners' motivation. Students may pay attention to a teacher who exudes positive characteristics, including friendliness, originality, excitement, and thoroughness in both method and style of instruction. Additionally, the expected level of learning is ensured via quality teaching. Sharker (2018) contends that essential motivation strategies for speaking and listening should be included in language learning classrooms. A solid logistical support system can be very beneficial

for developing skills. Therefore, instrumental motivation may be more helpful in promoting successful second language learning in the context of a language-learning classroom.

Furthermore, Purmama's research (2019) indicated that learners are interested in studying English. However, to increase students' motivation, the instructor must be more inventive in using the media and pedagogy or provide content in the teaching-learning process. Similarly, Song (2023), an approach to teaching English that involves providing opportunities for students to use the language and encouraging them to participate actively in class activities, may help students feel more successful and motivated to learn the language.

As stated by Mirza (2021), an effective teacher needs to connect extrinsic elements that can be introduced into the classroom by drawing on the sources of intrinsic motivation. It is also crucial for teachers to ascertain their students' demands, motivations, and other factors to develop effective motivational strategies. As a language course is being designed, motivation could erode. Teachers need to know that students have different expectations for their areas of interest.

Additionally, Khan and Takkac (2021) stated that motivation and self-efficacy in learning English as a second language are essential. Studies (Raoofi et al., 2012; Wang and Pape, 2012) have shown that self-efficacy is a powerful predictor of success in a variety of language skills and tasks, indicating the critical role that self-efficacy plays in learning.

Furthermore, based on the study by Nuñez (2021), learners in the Philippines have receptive language acquisition capabilities based on their self-efficacy scores. In addition, the English motivation data show that the respondents had an instrumental motivation. The finding indicates that students learn English because, if they can utilize it well, they can find a successful career that compensates well. Furthermore, the study discovered a significant correlation between students' motivation to learn English and their sense of self-efficacy. The result shows that the respondents' motivation to learn a language influences their self-efficacy.

Issues on English Language Learning Motivation

Motivation is an important factor in a student's capacity to overcome obstacles. Students may struggle to participate actively in language learning activities if they lack intrinsic motivation or need to understand the value of learning a foreign language (Purnama et al., 2019). Additionally, the study by Nguyen (2019) demonstrates that two important factors influencing learners' motivation to learn English were the academic year and parents' proficiency in the language.

Motivation is the result of a mix of good attitudes toward language acquisition, a desire to accomplish the aim of learning the language, and an endeavour (Gardner, 1985). To put it another way, motivation to learn a second language is the extent to which an individual works or seeks to acquire a second language out of desire, and the gratification felt after making this effort. Effort alone cannot determine motivation. A motivated person works hard to achieve a goal, but an energy-alone person is only occasionally inspired.

Furthermore, in the study of Dilshad, Nausheen, and Ahmed (2019), the three main things demotivate students to study English: inadequate grammatical understanding, speaking difficulties in English, and lack of confidence. It was further suggested, considering the results, that teachers teach grammar inductively, that students practice speaking and listening extensively, and that they use various motivational techniques to spark students' enthusiasm for learning English in the classroom.

Many additional studies have shown that Malaysian students are more extrinsically than intrinsically motivated; this problem must be addressed (Ainol et al., 2009; Samsiah et al., 2009; Thang, 2004). As a result, it is critical to develop or reinforce students' intrinsic motivation by helping them understand how important studying English is. Consequently, Puay (2020) states that to succeed in learning the language, students will acquire it naturally through positive attitudes, enjoy reading English-language resources, and decide to speak it

in everyday life. Students' motivation for learning English as a second language (L2) revealed that many models and multimedia instructions have been used to study the topic of motivation in English learning cited

Bautista et al., (2023). According to their research, various factors, including age and attitudes, moods, and emotions, affect language acquisition. Thus, motivation is the desire and willingness to learn, according to Krashen (1982).

Studies on the Development of Measurement Scale for English Language Learning Motivation

The construction of validation on language learning motivation and the processes and steps involved in creating a questionnaire on the desire to study a foreign language as a second language (also known as second language motivation) will be used in the study. Nikitin, Don, and Cheong (2016); Qryefy et al. (2024); Li (2023); and Puay (2020), the instrument uses both exploratory and confirmatory factor analyses to assess its psychometric qualities.

One of the most critical factors in the learning process is motivation. It is not easy to accomplish learning objectives without motivation. When it is included in the learning process, students will comprehend the materials—especially the English language—more fully (Purmama et al., 2019; Khan and Takkac, 2021). Motivation is a necessary component of task success, and it can largely explain the success or failure of any challenging task. Additionally, Alizadeh (2016), Mhlongo (2022), Husna and Martini (2019), and Song (2023) conducted surveys on language learning motivation (LLM) for students learning English as a second language in multicultural settings or for those learning the language for the first time are being considered.

English language learning motivation is also necessary as motivation is influential in the learning activity (Purmama et al., 2019; Griskell, 2018; Sharker, 2018; Qashoa, 2006; Srithongkham, 2012; Ugla, 2021; Wimolmas, 2013; Ekiz and Kulmetov, 2016; Widesti, 2016; Sudirman et al., 2022; Nuñez, 2021; Buda, 2014; Sari, 2019; Dang et al, 2021), motivation is also needed, though factors need to be considered intrinsic motivation. Furthermore, attitude and motivation are equally important for postgraduate students in learning the language, especially English. Not to mention that teachers Ng and Ng (2015) have their motivation as English Language Teachers in a language center.

Learning a foreign language requires motivation (Huang, 2005; Yang et al., 2012; Nguyen, 2019; Karabiyik and Mirici, 2018; Saheb, 2014; Gonzales and Lopez, 2015). The need for effort in learning foreign languages is evident since it is considered a process requiring individual effort. The Foreign Language Learning Effort Scale (FLLES) was created to gauge the effort levels of tertiary-level foreign language learners.

In their study, Alieto and Torres (2019) discovered no significant difference in male and female motivation levels to learn English. Moreover, second language motivation benefits English teachers, as it eliminates the need to continually stress the significance of learning English since students already clearly understand the subject's importance. Filipino ESL students are more instrumentally driven to learn English than ESL and EFL students from other parts of the world. In addition to instrumental drive, Filipino ESL students must cultivate a substantial degree of integrative motivation within themselves. In addition to instrumental motivation, Filipino ESL students must also cultivate a substantial degree of integrative motivation within themselves.

METHOD

Research Design

The study used a mixed-methods research design (MMRD), specifically an Exploratory Sequential mixed-method design (ESD). Using qualitative and quantitative approaches, this research design aims to create a research instrument for assessing the level of English Language Learning Motivation among college students – STEM related Program. An MMRD collects, evaluates, and combines qualitative and quantitative research methods within a single study to examine and explain research problems (Creswell, 2012). Each dimension in MMRD has to be carried out with great sensitivity while being critically appraised for validity concerns (Schoonenboom and Johnson, 2017). To this end, Aramo-Immonen (2013) argued that it allows researchers to solve their research problems objectively by employing holistic methods and triangulation.
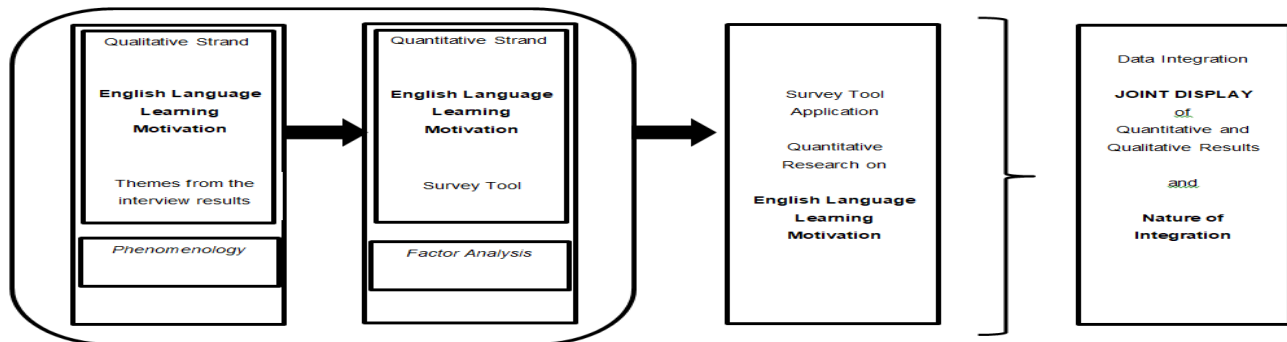
Source: Dr. Gloria P. Gempes (2023) Editable Templates for Mixed Methods Visual Concepts

On the other hand, ESD has two phases: the first starts with the collection and analysis of qualitative data and is followed by the collection and analysis of quantitative data. It emphasizes using qualitative data in constructing a survey questionnaire (Creswell, 2013). Furthermore, its last stage entails integrating or connecting the qualitative with the quantitative one (Berman, 2017). For instance, during ESD's first phase, English Language Learning Motivation. Second, in the quantitative phase, a questionnaire was developed to assess respondents' English language learning motivation using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA).

Perception on English Language Learning Motivation of College Students – STEM Related Program

Career and Global Relevance. The emerging theme of career and global relevance delves into college students' perceptions as they see career opportunities in their professional careers in STEM-related programs. Based on the interview, the college students shared insights on the importance of English as the language can provide an edge and expand their career opportunities. To college students in STEM programs, the theme Career and Global Relevance emphasizes how fluency in the English language improves access to international professional prospects. Cooperation, research, and communication frequently take place in English, and knowing this encourages STEM students to acquire English since it is an essential language for success in global workplaces, higher education, and career advancement. They also added that it can help them in both academic and professional contexts and enhance employability in the future. The students recognize the importance of English in their academic and future professions. Moreover, the language is essential in an international setting for participation and collaboration.

Intrinsic Learning Motivation. Another theme emerges through the students' responses during the interview. Learning English has a wide variety of benefits that affect a learner's academic and personal growth. It is intellectually stimulating and fulfilling on the learner's personality, enhancing the experience and sense of fulfillment in their language skills. Responses reflect a strong and personal motivation to learn the language – English. Their personal growth influences these, and even exposure to English at a young age. A few responses also reflect on their interests, such as watching movies, reading, and even writing poetry, which push them to learn and understand the language and cultural expressions in pursuit of personal improvement.

External Support and Influence. The next theme that emerged based on the students' responses was external support and influence. The support and influence of the family play a crucial role in learning the language

while not putting much pressure; this allows the respondents to have freedom and focus on learning, recognizing the progress and having fun in the process, creating a more conducive learning environment for the learners in achieving excellence. Additionally, teachers play an essential role in the process by providing feedback. Friends also participated in the learning as they provided motivation and occasional anxiety, as some excelled in English.

Self-Regulation. Another theme that emerges is self-regulation among college students as they take the initiative in learning English, being confident and believing in their ability to challenge and learn the language, be responsible and take control of the time in learning the language, the ability to identify the weaknesses and

as well as how to address them, and most importantly having perseverance and consistency in the process. The following are evident and explained based on their responses as follows:

Effort, Challenge and Commitment. Another theme that emerged during the interview among STEM students is the effort, challenges, and commitment, which are the key factors for success. In this case, success in learning English Language. The effort is the energy exerted by the respondents, the challenges are the hindrances they faced, and commitment is their dedication to focus and persist despite the participants' difficulties. In the study of Binothman et al. (2024), they argued that when learners face challenges, they develop meaning as they interact with these challenges and turn them into opportunities. Furthermore, they are driven by the motivation of their learning when they recognize the opportunities and challenges around their environment.

English Learning Attitudes. The last theme that emerged was the English Learning Attitudes of college students. Accordingly, college students' attitudes are multifaceted, shaped by their personal interest experiences and the external factors in which students actively engage in the learning process, manifesting through independent learning, classroom, and real-world interactions.
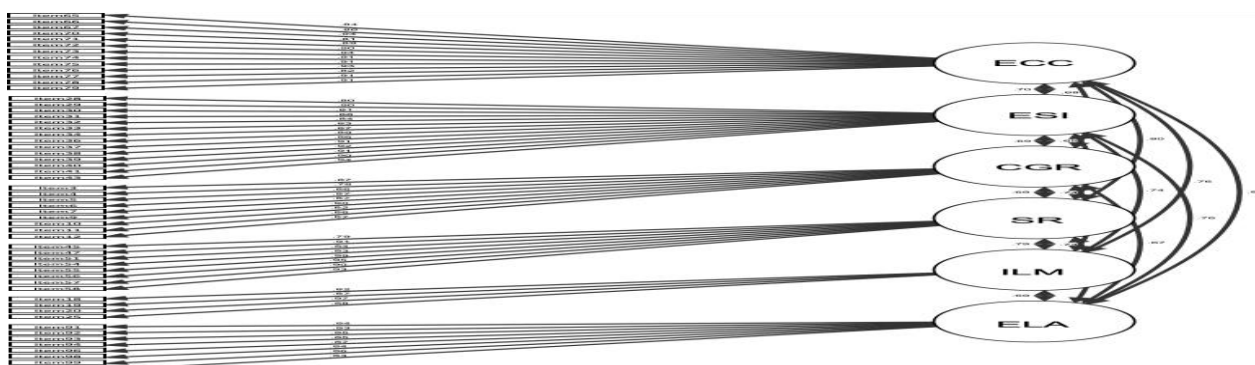
Underlying Dimensions of English Language Learning Motivation of College Students – STEM Related Program in Region XI

Using the EFA, the 6-Factor model with 56 – item ELLM scale was developed namely: *Effort, Challenge, and Commitment (ECC), External Support and Influence (ESI), Career and Global Relevance (CGR), Self-Regulation (SR), Intrinsic Learning Motivation (ILM),* and *English Learning Attitudes (ELA)*. The Kaiser Meyer-Olkin Measure, KMO of sampling adequacy, and Bartlett's sphericity test were used to ensure that the dimensions could be tested for factor analysis. Bartlett's test of sphericity tests the hypothesis that the correlation matrix is an identity matrix, indicating that the variables are unrelated and, therefore, unsuitable for structure. Small values, less than 0.05 at the significance level, suggest that factor analysis may be relevant for the data.

	KMO	χ^2	df	Sig	Interpretation
KMO Measure of Sampling Adequacy	0.873				Meritorious
Bartlett's test of Sphericity		19108	4950	.000	Significant

KMO and Bartlett's Test shows that the KMO value is 0.873, which is higher than the suggested value of 0.50 and thus acceptable. This suggests that the sample is significant and sufficient for factor analysis. The results also showed that Bartlett's test of Sphericity has a value of 0.000, interpreted as statistically significant. It implies that the data contains patterned relationships, and factorability is expected. The results of the two tests indicate that the dataset is appropriate for Confirmatory Factor Analysis (CFA).

Factor Structure of the Questionnaire on Assessing the Dimension of English Language Learning Motivation of College Students – STEM Related Program in Region XI

Confirmatory factor analysis was conducted to determine the best-fit model of the items to its factor. The developed 56–item checklist for assessing the dimension of English Language Learning Motivation of college students – STEM Related Program in Region XI based on the result of the EFA was administered to 300 respondents from private and public schools in Region XI. In this CFA survey, the respondents were asked to rate their agreement to the statements through a Five-point Likert scale: five-point Likert scale: 5 – Strongly agree, 4 – Agree, 3 – Moderately agree, 2 – Disagree, and 1 – Strongly disagree.

Utilization of the Tool to Measure the Significant Difference between the Level of English Language Learning Motivation of College Students – STEM Related Program in Region XI when Grouped according to sex, year level, program, and type of school

Moreover, the level of Effort, Challenge, and Commitment (ECC) has a standard deviation of 0.69 and a mean of 4.05 with a descriptive level of High. This means that the college students – STEM related program agree on the importance of English. Item 7, I recognize that English challenges are the opportunities for growth with a standard deviation of 0.75 and a mean of 4.30 with a descriptive level of Very High. While item 11, I dedicate time regularly to learning and practicing English with a standard deviation of 0.97 and a mean of 3.80 with a descriptive level of High.

DISCUSSION

Perception on English Language Learning Motivation (ELLM)of College Students – STEM Related Program in Region XI

One of the objectives of this study is to explore the perception of college students – in related programs through in-depth interviews (IDI) and focus group discussions (FGD). The gathered information from the participants leads to the emergence of the six essential themes: effort, challenges, and commitment (ECC), external support and influence (ESI), career and global relevance (CGR), self–regulation (SR), intrinsic learning motivation (ILM), and English learning attitudes (ELA).

The study's findings are supported by Chen (2019), stating that students' desire to learn a language manifests by demonstrating how their motivations for doing so may affect their engagement and participation in class,

learning beliefs about the language, and eventually – language proficiency.

Moreover, this is reinforced by the study of Wallace (2020) and Lee and Lin (2022), which emphasized that one well–known element that is crucial to language learning success is motivation, which is essential for long-term learning achievement, particularly for younger students. In the end, more motivated students who are more engaged in learning achieve more success. Additionally, Muth and Lüftenegger (2024) said that motivational processes are essential for lifelong learning and are present in all facets of education.

Effort, Challenges, and Commitment (ECC). The essential theme of effort, challenges, and commitment (ECC) focuses on how college students – in STEM-related programs cope and push themselves in the English language learning motivation. Based on the findings and interview, college students embrace challenges as they believe they would lead them to personal development and growth, persistence in overcoming difficulties in English language learning, continuous learning, speaking and presentations, and most importantly, setting goals. This conforms to the study of Manjet Kaur (2019), which emphasized that gaining the necessary discipline content knowledge and enhancing English language skills can help overcome prevalent challenges such as a lack of confidence in speaking.

During the interview, the college students mentioned integrating different strategies when learning English. This is consistent with Alhasan et al. (2024), stating that students employed strategies such as self–control, self–assurance, practice/ preparation, humor, and a supportive setting. Students' unique methods were found by detailing how they handled their English speaking. Additionally, the findings show that students use self–calming strategies to lessen the impact of English when faced with situations involving communication that cannot be avoided.

Further, they also believe and recognize that learning and mastering the English language is challenging, yet it offers numerous possibilities as they embark on and embrace the process. For example, students need to enhance their reading comprehension to understand what they are reading. To do that, they need to practice reading to increase reading comprehension, as most textbooks are written in English and examinations. This is supported by Al-Hawamdeh (2025), stating that students can only develop cognition through extensive practice of diverse strategies and numerous, repeated classroom tasks because they need to feel more at ease with comprehension. Burgos (2023) also suggests that KWL strategies can increase reading comprehension in English.

Not only that, when one is committed to learning English, it also builds confidence, resilience, and persistence, which is aligned with the study of Al-Khresheh (2024), Li, Zhang, and Sang-Bing Tsai (2021) and Liu (2021) stating that self – confidence in English has a significant impact on learners' performance, optimism, and success in key linguistic tasks. Moreover, this is also supported by Ulum (2024), claiming that the process of learning the language builds confidence, stimulates classroom engagement, and lowers anxiety.

Furthermore, college students recognize that English is not just about achieving fluency but also about growth and transformation and personal and professional development opportunities. This corroborates the research by Moharami (2024) and Huynh et al. (2024), emphasizing that English is actively used by language learners as a communication and personal development tool and Estaji's (2024) professional growth.

Moreover, the college students mentioned allotting time to learning the language to acquire vocabulary and grammar. Gui and Ismail (2024) support this, stating that planning time is required to achieve desirable language production and proficiency. In contrast, the socio-economic gap in foreign-language learning (2021) argued that inequity in student achievement is linked to disparities in learning time in language instruction.

Additionally, the college students mentioned goal-setting, which is supported by Wang et al. (2024), who recommended that students need goal-setting that is measurable, specific, and attainable in learning general English, which helps the students effectively in regulating their learning. Some students' answers mentioned using technology and AI as tools to fasten and enhance their language learning. This notion is supported by Alazemi (2024), stating that formative evaluations powered by AI can significantly improve students' academic reading comprehension and enjoyment. Moreover, Biju et al. (2024) and Elov et al. (2025) stated that AI-assisted tools can produce a beneficial learning environment, reduce anxiety, enhance motivation, and improve attitudes—all of which contribute to delivering valuable information.

External Support and Influence (ESI). Another emerging and essential theme that arises from the college students' answers is STEM-related programs. Like any other skill, learning English is a dynamic, complex process that depends on many circumstances. According to the students' responses, peer encouragement is one of the primary sources of motivation for learning English. This aligns with the study of Harakeh and Boer (2019), which states that peer encouragement results in risk-taking. On the contrary, Chakraborty (2023) states that students may make unsure judgments because peer pressure would result in risky behavior, loss of self–worth, and sometimes, emotional abuse.

Likewise, educators are crucial in encouraging learners to acquire English. Teachers are sources of emotional support in addition to offering the required instruction. Increased involvement and a more incredible drive to succeed can result when teachers recognize and value their students' accomplishments. An important factor in encouraging students to continue their education is a sense of accomplishment, which may be fostered by acknowledging their efforts. This agrees with the study of Dang et al. (2021), which found that teachers influenced students' motivation. Students pay attention when a teacher exhibits good traits like friendliness, inventiveness, excitement, and thoroughness in both method and style of instruction.

Additionally, teachers can help students stay focused and persistent in their language learning endeavors through specific encouragement, critical criticism, or praise. Again, this is in line with the study of Puay (2020) and Soriano et al. (2021), which claims that students' motivation to study is strongly impacted by the instructor and the teaching methods backed by pertinent guidance and suggestions, comments, and feedback.

Another important element in encouraging students to learn English is family support. A learner's attitude towards English can be significantly impacted by the participation of family members, particularly parents. Parents are more inclined to support their children's learning if they understand how important English is to their children's academic and professional future. This finding is supported by Gam and Lynch (2020), Zedan (2024), and Flood and Eamoraphan (2020), who stated that parental encouragement and involvement have a positive impact on the students' motivation to learn English. According to Ekiz (2016) and Soriano et al. (2021), family is where learning starts.

On another note, college students stated that encouragement from friends and extended family immensely affects a learner's motivation. Their encouragement helps learners overcome self-doubt and difficulties in learning English by boosting their confidence. Students can take chances, make errors, and keep improving in a safe learning atmosphere fostered by this emotional support. This is supported by Protassova and Silkin (2025), stating that nothing can replace the family interaction from the professional relationship between students – and teachers. Moreover, Flowers (2017) claimed that having support from friends and family with whom they had interpersonal relationships would be a protective factor against obstacles learners may encounter.

Career and Global Relevance (CGR). Another important theme is the career and global relevance (CGR). According to this theme, English proficiency is vital for career progression, especially in STEM fields, since it improves employability, opens worldwide employment options, and is necessary for collaborating across borders. It also makes it possible to communicate effectively, particularly in technical fields, and to comprehend technical language more thoroughly. English is functional in daily life and offers more access to international networks and opportunities, in addition to its professional advantages. This is supported by the study entitled Making a Case for English for Specific Purposes in China: Listening to Stakeholders' Voices (2024), which emphasizes that English would enhance opportunities for global competition and career growth. This is backed by Liu (2020), who states that those proficient in spoken English gain more potential and opportunities in their career and professional development.

Self – Regulation (SR). Self–regulation is another essential theme that arises from the answers of college students in STEM-related programs. Those who adhere to this are motivated by the ability to control their learning pace, address their weaknesses, and use self–assessment to track progress. The points present a proactive and self–directed approach to improving English skills, emphasizing confidence in independent learning, taking responsibility for progress, and setting personal goals by using online resources. This conforms to the study of Lai et al. (2024), which suggests that self–directed learning should be given more attention when learning the language, such as using technology for English learning beyond the classroom. Moreover, Azatova (2021) suggests that it is beneficial to set aside time during the day to assist students in creating, tracking, and reflecting on objectives to promote self–control and independence as language learners.

Intrinsic Learning Motivation (ILM). Intrinsic learning motivation is another essential theme that arises from the college students' answers – STEM-related programs. This conforms with the study of Husna and Martini (2019), who believe that integrative or intrinsic motivation is crucial in creating a more stimulating learning environment and influencing students' attitudes and self–satisfaction self–satisfaction. Moreover, Sari's (2019) research findings claimed that there was a more significant average score for intrinsic motivation than external motivation, with most learners acquiring English due to intrinsic motivation because they want to comprehend people, culture, and things related to English, which arises within individual effort towards achieving their goals in learning the language.

Additionally, college students in STEM programs are intrinsically motivated learners as they are naturally interested in it, which gives them low anxiety while enjoying the process. This is supported by the study of Teng and Wu (2024), which states that learners typically experience low anxiety levels and high satisfaction during the learning process. Moreover, these learners usually recover quickly from setbacks and exert more effort to perform better in the future. Moreover, Seven (2020) argued that most students study English because they think it will help them in one way, and learners will not succeed in their endeavors and aspirations to learn if they lack strong motivation.

English Learning Attitudes (ELA). The sixth essential theme from the interview is the English learning attitudes of college students – STEM-related programs. Personal motivation, good teaching strategies, and a supportive classroom environment influence college student in STEM-related programs' motivation to study English. The study's findings conform to Chih-Fong Lo and Chin-Huang's (2020) study, claiming that learners who understand how crucial English is to their school and workplace success are typically more committed and proactive in their language practice. Teachers who employ dynamic, engaging lessons and provide helpful criticism significantly increase learners' motivation.

Additionally, children are encouraged to express themselves freely and gain confidence in their language abilities in a friendly classroom environment. Together, these elements increase the likelihood that STEM students will become highly proficient in English and continue to be motivated to further their careers.

The findings of this study agree with the findings of Chuanon, Chaisiri, and Nilubol (2022), who concluded that the learner's attitude positively impacts English language learning motivation. They added that the learners are positive towards the teachers and the instruction, though they expressed concerns about the assessment. However, the learners were satisfied with their overall learning experience in the language as they saw the importance of learning in their academic achievement and job opportunities.

As to the responses during the interview, the students also expressed the role of the teachers in teaching strategies to assist their learning, which enhances their motivation to learn. Yu, Xu, and Sukjairungwattana (2023) suggested that using mobile in English language learning can enhance the learning experience more than traditional instruction.

Underlying Dimensions of English Language Learning Motivation of College Students – STEM Related Program

Following several analyses, mainly exploratory and confirmatory factor analyses, six dimensions of English Language Learning Motivation (ELLM) of college students in STEM-related programs were identified: Effort, Challenges and Commitment, External Support and Influence, Career and Global Relevance, self–regulation, Intrinsic Learning Motivation, and English Learning Attitudes. The confirmatory factor analysis also investigated the relationship between emerging English Language Learning Motivation variables. Some variables indicate a strong positive association. This finding indicates that the two variables tend to increase and decline concurrently.

The confirmatory factor analysis (CFA) was used on English Language Learning Motivation in college students – STEM-related program constructs to ensure the final dimensions, representation of items to its factor, and the goodness of fit of the factor models.

Measurement Tool Suitable for Assessing the English language learning Motivation of college students – STEM related program in Region XI

Factor 1: Effort, Challenge and Commitment (ECC)	
1	I am willing to put in extra effort to improve my English skills.
2	I challenge myself to use English even in difficult situations.
3	I embrace English learning challenges to enhance my proficiency.
4	I challenge myself by engaging in public speaking or English presentations.
5	I embrace English-related tasks even when they are outside my comfort zone.
6	I push myself to improve my English even when I find it difficult.
7	I recognize that English challenges are opportunities for growth.
8	Overcoming struggles in learning English boosts my confidence and persistence.

9	I am fully committed to improving my English proficiency.
10	I set personal goals to enhance my English language skills.
11	I dedicate time regularly to learning and practicing English.
12	I push myself to reach a higher level of English fluency.
13	I am determined to master English and use it effectively.

Factor 2: External Support and Influence (ESI)

14	Encouragement from my peers motivates me to study English.
15	Support from teachers helps me stay engaged in learning English.
16	I learn English better when my efforts are recognized by others.
17	Encouragement from family and friends positively impacts my motivation.
18	I feel more confident learning English when I have external support.
19	My parents support my English learning efforts.
20	I feel encouraged to learn English because my parents value it.
21	My parents' support positively influences my motivation to study English.
22	I am motivated to learn English because of my family's encouragement.
23	I feel motivated to learn English when I receive positive feedback.
24	Recognition of my English skills encourages me to keep improving.
25	Praise from teachers helps me stay committed to learning English.
26	I gain confidence when my efforts in English learning are acknowledged.
27	Support from my educational institution encourages me to enhance my English skills.

Factor 3: Career and Global Relevance (CGR)

28	Knowing English gives me a competitive edge in my future profession.
29	I believe English proficiency will expand my career opportunities.
30	English is crucial for effective communication in my field of study.
31	I study English with the future in mind, knowing it will benefit my career.
32	My motivation to learn English is closely tied to my long-term career goals.
33	I am motivated to learn English to increase my employability.
34	I believe mastering English will open doors to global job opportunities.
35	I need to study English to understand technical terms used in my field.
36	English is important regardless of my chosen course.

Factor 4: Self-Regulation (SR)

37	I feel confident in my ability to learn English independently.
38	I believe I can improve my English skills through consistent effort.
39	I make use of online resources to supplement my English learning.
40	I prefer choosing my own methods for learning English.
41	I feel more motivated when I can control my own learning pace.
42	I find it easier to learn English when using strategies that suit me best.

43	I perform better in English when I apply my preferred learning style.
44	I learn English best when I study in ways that personally engage me.

Factor 5: Intrinsic Learning Motivation (ILM)	
45	Learning English allows me to express my ideas clearly and confidently.
46	I am naturally interested in understanding and mastering the English language.
47	I find studying English intellectually stimulating and rewarding.
48	I find learning English enjoyable, even though it is challenging.

Factor 6: English Learning Attitudes (ELA)	
49	My English teacher's teaching style motivates me to learn more.
50	Classroom discussions in English help me develop my language skills.
51	I learn best when my teacher provides engaging and interactive English lessons.
52	I prefer learning English through practical and hands-on activities.
53	My motivation to learn English increases when my teachers encourage me.
54	Interactive and engaging lessons make me more interested in learning English.
55	I learn better in a classroom where English is actively used in discussions.
56	Supportive classmates and a positive classroom environment improve my motivation.

After the series of data gathering and analysis, both qualitatively and quantitatively, the final instrument for assessing the level of English language learning motivation of college students – STEM-related programs in Region XI has 56 items distributed to six dimensions. The six dimensions are effort, challenges, and commitment (ECC), and they are presented in thirteen statements. Next is the second dimension, external support, and influence (ESI), with fourteen statements. Further, the third dimension is career and global relevance (CGR), which has eight statements. The fourth dimension is self–regulation (SR), which consists of eight statements. Then, the fifth dimension is intrinsic learning motivation (ILM) with four statements, and the sixth is English learning attitudes (ELA with eight statements. The 5-point Likert scale is used, ranging from 5 – Strongly agree to 1 – Strongly disagree, to rate respondents' level of agreement with the statements.

Reliability Test of the English Language Learning Motivation on College Students – STEM Related Program Scale

Factors/Dimensions	No. of Items	Cronbach's Alpha	Interpretation
Effort, Challenge and Commitment (ECC)	13	0.937	Excellent
External Support and Influence (ESI)	14	0.951	Excellent
Career and Global Relevance (CGR)	9	0.910	Excellent
Self-Regulation (SR)	8	0.899	Good
Intrinsic Learning Motivation (ILM)	4	0.854	Good
English Learning Attitudes (ELA)	8	0.909	Excellent
OVERALL	**56**	**0.973**	**Excellent**

The instrument developed for assessing the English Language Learning Motivation level was administered to 30 college students from the provided school in Davao del Norte for pilot testing. The overall reliability is good, with a Cronbach's alpha of 0.973. This agrees with Ahady et al. (2017, as cited by Elham and Bhoi,

2023) that a Cronbach's alpha of 0.8 means that the instrument has an internal consistency of good. Moreover, all the items in the instrument have Cronbach's alpha coefficients that range from 0.823 to 0.847. This is interpreted to mean that all the items in the instrument are reliable. About Bruton et al.'s (2000) assertion, based on Cronbach's alpha value, the instrument or statements can be interpreted as consistently measuring the item when employed throughout time or with various respondents.

Utilization of the Tool to Measure the Significant Difference between the Level of English Language Learning Motivation of College Students – STEM Related Program in Region XI when Grouped according to Sex, Year level, Program, and Type of School

Table 6.2 Results on the Significance of the Difference in the Level of English Language Learning Motivation of College Students – STEM Related Programs when analyzed according to Grouping Variables

Sex (Male vs. Female)				
Dimensions	**T**	**df**	**p-value**	**Interpretation**
ECC	3.82	298	0.000	Significant
ESI	3.46	298	0.000	Significant
CGR	1.32	298	0.189	Not Significant
SR	3.03	298	0.003	Significant
ILM	2.08	298	0.038	Significant
ELA	4.00	298	0.000	Significant
Overall (ELLMCS-SRP)	**3.62**	**298**	**0.000**	**Significant**
Type of School (Private vs. Public)				
Dimensions	**T**	**df**	**p-value**	**Interpretation**
ECC	1.489	298	0.137	Not Significant
ESI	1.376	298	0.170	Not Significant
CGR	1.592	298	0.112	Not Significant
SR	1.164	298	0.245	Not Significant
ILM	0.649	298	0.517	Not Significant
ELA	1.984	298	0.048	Significant
Overall (ELLMCS-SRP)	**1.644**	**298**	**0.101**	**Not Significant**

The result revealed that the English language learning motivation of college students in STEM-related programs is High. This means that college students in STEM-related programs demonstrate outstanding abilities or motivation, consistently excelling and exceeding expectations.

Moreover, the result of this study shows that the level of English language learning motivation of college students – in STEM-related programs has a significant difference when grouped according to sex. This means that regardless of their sex, the student's English language learning motivaion level varies. Hence, the null hypothesis is rejected. This is consistent with Tanaka (2023), who demonstrated that motivation is significantly impacted by sex. However, the study's result shows no significant difference in the career and global relevance of college students in STEM-related programs when grouped according to sex.

Table 6.3 Results on the Significance of the Difference in the Level of English Language Learning Motivation of College Students – STEM Related Programs when analyzed according to Grouping Variables

Program (Engineering vs. Mathematics vs. Science vs. Technology)				
Dimensions	**F**	**df**	**p-value**	**Interpretation**
ECC	2.959	3	0.034	Significant
ESI	0.762	3	0.517	Not Significant
CGR	0.939	3	0.423	Not Significant
SR	1.301	3	0.276	Not Significant
ILM	1.765	3	0.156	Not Significant
ELA	3.188	3	0.025	Significant
Overall (ELLMCS-SRP)	**1.949**	**3**	**0.124**	**Not Significant**
Year Level (First Year vs. Second Year vs. Third Year)				
Dimensions	**F**	**df**	**p-value**	**Interpretation**
ECC	1.182	2	0.309	Not Significant
ESI	0.641	2	0.528	Not Significant
CGR	0.535	2	0.587	Not Significant
SR	1.614	2	0.202	Not Significant
ILM	0.255	2	0.775	Not Significant
ELA	0.140	2	0.869	Not Significant
Overall (ELLMCS-SRP)	**0.679**	**2**	**0.508**	**Not Significant**

In addition, the results show no significant difference between college students' level of English language learning motivation – STEM-related programs when grouped according to year level. This means that the null hypothesis is accepted. This means that the English language learning motivation has no difference according to year level. The finding is supported by the study of Imsa-ard (2020), claiming that the year level yielded different motivations in English language learning. However, Nguyen's (2019) research states that the school year significantly influences learners' motivation to learn English, contrary to the former.

Furthermore, the results show no significant difference between the level of English language learning motivation of college students – STEM-related programs when grouped according to program, Science, Technology, Engineering, and Mathematics specifically. This means that the null hypothesis is accepted. However, it appears that college students from the science programs have the highest mean of 4.24, which is Very High, compared to Technology, with a mean of 3.95, which is High in effort, challenges, and commitment (ECC). Additionally, the science program also displays a Very High level of English language learning motivation, with a mean of 4.24, compared to the technology program, with a mean of 3.95 in English learning attitudes.

Additionally, the results show no significant difference between the level of English language learning motivation of college students – STEM-related programs when grouped according to type of school, private and public. This means that the null hypothesis is accepted. This contrasts with the study of Inngam and Eamoraphan (2014), which suggests that the motivation to learn the English language is higher in private schools than in public schools in Bangkok, Prawate District. Moreover, it appears that effort, challenges, commitment, external support and influence, career and global relevance, self–regulation, and intrinsic learning motivation are not significant. However, the English learning attitudes significantly differ in English language learning motivation of college students – STEM-related programs when grouped according to type of school.

Thus, it can be noted from the result of the study that there is a significant difference between the English language learning motivation of college students – in STEM-related programs when grouped according to sex. However, there is no significant difference between college students' English language learning motivation – STEM-related programs when grouped according to year level, program, and type of school.

Data Integration of Salient Qualitative and Quantitative Findings

In the joint display of salient qualitative and quantitative findings, the factors and items from the quantitative phase supported and strengthened the themes that emerged from the qualitative phase. This insight indicates that quantitative data confirms the qualitative data of the study.

The qualitative and quantitative data for English language learning motivation is integrated through connecting and building. It indicates that the ELLM has six essential themes. Each theme has its own items that contribute to its overall strength.

The integration supports that result, which shows that internal and external factors influence English language learning motivation. As Arcipe and Balones (2023) noted, a supportive and engaging learning environment can generate students' inner desire to learn. Studies by Purnama et al. (2019) and Khan and Takkac (2021) also reveal that broader goals such as career opportunities, cultural integration, and global citizenship drive motivation. Additionally, Dang, Lee, and Ha (2021) stated that parental support, positive attitudes toward teachers, as added by Chuanon, Chaisiri, and Nilubol (2022), and the balance between intrinsic and extrinsic motivation all play key roles in helping learners stay motivated and committed to learning English.

Furthermore, on factor structure, it was found that all the essential themes derived from the qualitative data were retained. Following the CFA, it was found that six factors remained as dimensions of English language learning motivation. The data integration is based on connecting, testing, and validating. All the items retained for each factor have a factor loading value greater than 0.40. This finding is consistent with Guadagnoli and Velicer (1988) and Hayton et al. (2004), who argue that variables and items with a factor loading value greater than 0.4 are stable and should be retained. Additionally, the final instrument has a Cronbach's alpha coefficient, indicating good reliability.

Implication for Educational Practice

To begin with, teachers should emphasize the value of English for professional growth since it is essential for future employment prospects, especially in international STEM-related programs. This can be achieved by incorporating real-world scenarios, industry-specific terminologies, and career-focused learning materials into the curriculum. In the same manner, students should realize that proficiency in English is necessary for their employability and international mobility in addition to their academic accomplishment. In addition, English provides a channel for global cooperation. Teachers should help students develop a mentality that views English as a necessary language for intercultural communication and eventual career success.

Next, creating a learning context that is both rewarding and intellectually stimulating for the learners is essential. Teachers should allow learners to interact with English in ways that suit their interests, such as through literature, music, or film. Thanks to this, students would be better able to appreciate the language outside the classroom. Also, students will perceive English as a tool for discovering various cultures and viewpoints if cultural learning is integrated with language acquisition. Literature reviews, international case studies, or conversations on world events could all be used to accomplish this.

This is followed by positive reinforcement, where students receive praise for their progress, which can significantly increase their motivation. Schools and universities should provide a solid support system, including language workshops, mentorship programs, and tutoring sessions. Learners can maintain motivation and improve their skills with regular positive feedback from teachers and peers. Not to mention the encouragement of family and peer involvement in the learning process. Parents should be informed about the importance of English for their child's future, and educators can provide guidance on how they can support their child's learning at home.

Additionally, teachers can assist students in establishing personal milestones and monitoring their progress, which can help students feel more in control of their learning and give them a sense of accomplishment as they reach their goals. Educational institutions should also give students access to online resources and tools that enable them to practice and improve their English independently, such as language learning apps, forums, and online discussion platforms.

Teachers should give students challenging yet manageable assignments like public speaking, English presentations, or real-world simulations to increase their confidence and language skills. These assignments can promote progress via challenges by pushing learners beyond their comfort zones. Teachers should also provide an environment where students can accept and grow from their mistakes. Perseverance should be emphasized since it will help learners become more resilient in adversity, boosting their confidence and English proficiency.

Furthermore, based on the study's findings, the English language learning motivation of college students in STEM-related programs is High. This means that the college students STEM-related program has a level of English language learning motivation through effort, challenges, commitment, career and global relevance, external support and influence, self–regulation, intrinsic learning motivation, and English learning attitudes. College students in STEM-related programs recognize the importance of English as this would give them a competitive edge in global markets and would give them technological advancements. Moreover, proficiency in English leads to more job options and opportunities, especially in global settings where English communication is essential. Additionally, learning English allows students to interact with media by watching movies and YouTube videos, reading books and other literature, and learning about cultures worldwide while fostering intellectual fulfillment and personal development.

Furthermore, college students in STEM-related programs are motivated by peer, teacher, and family support, which increases their self-esteem and emphasizes the value of English for their future success. Also, students are more likely to succeed in learning the language if they establish personal objectives, practice independently, and look for opportunities to use English in everyday situations. Being open to new challenges and trying to use English in professional and academic settings boosts motivation and advancement. Learners are more likely to remain motivated and achieve if they participate in class discussions, enjoy studying, and feel comfortable in English-speaking settings. Finally, a supportive learning environment with interesting classes and helpful criticism keeps college students – STEM-related programs inspired and committed to their language objectives.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The English language learning motivation of college students – STEM-related programs is based on different factors. College students in STEM-related programs are motivated to acquire English due to various factors, including career relevance, external support, and personal effort. Along with the support of peers, teachers, and family and the autonomy to direct their own learning, students are motivated by the desire to develop their language proficiency for personal development and career success.

Furthermore, intrinsic motivation is important since learning English provides students in STEM-related programs with both intellectual stimulation and personal fulfillment. College students see learning a language to improve their skills for clear communication of complicated ideas and a skill essential for success in school and the workplace. Deeper involvement and a sustained commitment to enhancing their language skills are fostered by combining personal motivation, external support, and the real-world use of English in their profession.

The dimension of English language learning motivation includes effort, challenges, and commitment (ECC), which is the first dimension. College students enrolled in STEM programs need to show that they are dedicated to getting better at English by taking on challenges, practicing public speaking, learning vocabulary and grammar, and stepping beyond their comfort zones. Their language proficiency, self-esteem, and perseverance

are all improved by this commitment, all of which are critical for success in academic and professional STEM settings.

The second dimension is external support and influence (ESI), one of the most important factors in encouraging college students to get better at English. It is outside assistance from peers, instructors or teachers, parents, extended families, and educational institutions. Students' confidence, involvement, and dedication to learning English increase when they receive praise, positive feedback, encouragement, and acknowledgment from these individuals.

Followed by the third, career and global relevance (CGR), another dimension of college students' English language learning motivation – STEM-related programs. This states that English proficiency is crucial for boosting communication across various academic disciplines, increasing employment chances, and improving job opportunities. The long-term advantages of learning English for employability, comprehending technical terms, and accessing international job markets motivate students to strive to do so.

The fourth dimension of English language learning motivation is self–regulation (SR), which emphasizes how crucial individual control and customized learning methods are to proficiency in English. When people can freely control their learning pace, employ their chosen strategies, and interact with resources that meet their requirements, they feel more motivated and perform better.

The fifth dimension, intrinsic learning motivation (ILM), which covers a strong personal interest and enjoyment in learning English, motivated by the intellectual challenge and the fulfillment of mastering the language, is highlighted by the intrinsic learning motivation component. Students find studying exciting and fulfilling, and they are driven by the need to communicate in English with clarity and confidence.

Lastly, the sixth and last dimension of English language learning motivation is English learning attitudes (ELA), which highlights how encouraging classroom environments and dynamic, engaging teaching strategies affect students' enthusiasm to learn English. Teachers who promote involvement, offer real-world activities, and create a welcoming, dynamic environment see an increase in student motivation and learning outcomes.

Additionally, with the developed instrument, the English language learning motivation of college students – STEM-related programs are found to have a high level of ELLM. This means that the English language learning motivation of college students – STEM related program demonstrates outstanding abilities or motivation, consistently excelling and exceeding expectations of effort, challenges, and commitment, career and global relevance, external support and influence, self–regulation, intrinsic learning motivation, and English learning attitudes.

They can seamlessly have a strong commitment or performance level of motivation for English language learning. Additionally, it was found that there is no significant difference between the level of English language learning motivation of college students – STEM-related programs when grouped according to year level, program, and type of school. Hence, the null hypothesis is accepted. However, there is a significant difference between the level of English language learning motivation of college students – in STEM-related programs when grouped according to sex. Hence, the null hypothesis is rejected.

Furthermore, Gardner's Socio-Educational Model concept supports this by highlighting the intrinsic and extrinsic motivation in language acquisition. Based on the theory of Deci and Ryan, college students – in related programs are motivated to learn English based on their needs, such as career and global opportunities, the need for competence, and self–regulation. On the other hand, Gardner emphasized intrinsic motivation, such as enjoyment in language learning.

Recommendations

This study outlines the perceptions of English language learning motivation (ELLM) of college students – STEM-related programs, as reflected in the qualitative findings. With these findings, it is recommended that teachers should work with external support like parents, peers, friends, mentors, and even extended families to

deepen students' learning, promote self–regulation through goal–setting and progress tracking, and cultivate intrinsic motivation by designing engaging, relevant learning experiences to improve language acquisition. Additionally, teachers should address issues by providing workable tasks like additional practice and tailored feedback, highlighting the practical application of language learning for future professions, particularly in STEM fields, and fostering positive attitudes by establishing a classroom atmosphere that is encouraging and full of success stories. All these strategies can work together to inspire learners, produce a successful, rewarding educational environment for learning the English language, and increase their motivation to learn.

Furthermore, learners should actively participate in learning by establishing objectives and evaluating their progress, develop self–discipline via regular practice and time management, and make use of external support like study groups, peers, friends, parents, extended families, and teachers, and use of technology like internet resources, YouTube videos, and podcast to improve their language acquisition. Linking language proficiency to future professional objectives, particularly in STEM careers and professions, and accepting challenges with perseverance and an openness to learning from errors is crucial. They may further help their journey by keeping an optimistic outlook, concentrating on progress rather than perfection, and remaining receptive to new learning strategies.

Moreover, as for schools, schools should establish a positive learning culture through extracurricular activities, language clubs, and peer interaction is important. Schools should also provide self-regulation training programs to help students improve skills such as goal setting, time management, and self–reflection on their progress. Finally, schools should work with external experts and industries related to students' prospective careers and professions to provide global perspectives on language use in STEM fields and emphasize the connection between language learning and career advancement, especially in STEM industries, through seminars, workshops, and counseling.

Future studies should examine the effects of digital resources on language learning motivation, especially for students without traditional assistance, such as AI-driven platforms, online communities, and language learning applications. By providing individualized feedback, encouraging collaboration, and creating a tech-driven learning environment, this study would investigate whether these technologies successfully improved long–term motivation and engagement, particularly in STEM-related programs.

Furthermore, the study's result revealed no significant difference between the level of English language learning motivation when grouped according to year level, program, and type of school. However, there is a significant difference between college students' English language learning motivation when grouped according to sex. Thus, since there is no significant difference in motivation between year levels, programs, or type of school, the results suggest that educational institutions concentrate on individualized motivation strategy.

Nevertheless, given the significant difference in motivation between male and female students, tailored interventions for each group should be considered. Developing more successful programs and interventions may be possible by conducting additional research that would investigate the causes of these variations. Furthermore, encouraging a collaborative, inclusive learning environment and routinely tracking student motivation through feedback can improve support and engagement for all students.

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