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The Impact of Inquiry-Based Learning on Motivation and Foreign Language Anxiety in EFL Learners

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ABSTRACT

Inquiry-Based Learning (IBL) has increasingly been recognized as an effective pedagogical approach for enhancing learner engagement and addressing affective barriers in second language acquisition. This study explores the impact of IBL on motivation and foreign language anxiety among intermediate EFL learners in a Spanish higher education context. Using a quasi-experimental pre-test/post-test design, 48 participants were randomly assigned to experimental and control groups. The experimental group completed an eight-week IBL program structured around exploratory tasks that encouraged questioning, collaboration, and autonomous problem solving, while the control group followed conventional instruction. Data were collected through the Foreign Language Classroom Anxiety Scale (FLCAS) and the Attitude/Motivation Test Battery (AMTB), administered before and after the intervention. Results revealed significant increases in motivation and substantial reductions in anxiety among learners exposed to IBL, with large effect sizes supporting the robustness of the findings. The approach fostered a supportive learning environment in which students displayed higher levels of confidence, intrinsic motivation, and willingness to communicate. These results suggest that IBL not only enhances linguistic development but also functions as an affective regulator, promoting emotional resilience and engagement. The study highlights the potential of inquiry-based methodologies to cultivate more dynamic, autonomous, and emotionally positive learning experiences in EFL classrooms.

INTRODUCTION

Within the contemporary educational landscape, the acquisition of diverse competences, particularly critical thinking and problem-solving skills, stands as an imperative for effective learning in the 21st century. However, the prevailing reality in our educational settings, including higher education institutions, unveils a discernible gap in the cultivation of students' global and civic skills essential for navigating a complex world fraught with substantial challenges (Reimers, 2009). Teachers grapple with impediments, particularly curriculum-focused courses that encompass expansive material targets, resulting in passive student engagement and limited interaction (Grové & Laletas, 2020). Surmounting these challenges necessitates innovative pedagogical approaches, guided by educators attuned to the distinct characteristics of 21st century learners (Gunzelmann, 2014).

The escalating demand for professionals equipped with critical thinking, problem-solving, and communication skills responds to the dynamic shifts in social needs. Higher education, consequently, is compelled to prioritize these proficiencies and incorporate training in creative thinking to equip graduates for forthcoming interdisciplinary challenges. In the realm of education and research, active learning methodologies, exemplified by Inquiry-based Learning (IBL), prove more efficacious than conventional methods. Endowed with a structured, guided, and open approach, IBL serves to nurture creative skills, rendering it particularly conducive to fostering communicative competence, vital in the pedagogy of contemporary second language acquisition (Zhou, 2017).

The conceptual underpinnings of IBL align harmoniously with the pedagogical philosophies of pioneers such as Lev Vygotsky and Jerome Bruner, who accentuated self-discovery as a pivotal facet of the learning process (Bruner, 1960; Schwab, 1978). This pedagogical approach perceives students as active participants in knowledge construction, engaging in hands-on investigations and social interactions. Empirical observations by Von Secker (2002) and Jasperson (2013) sustain the affirmative impact of inquiry-based learning techniques on students' comprehension of scientific subjects and the cultivation of advanced thinking skills. Notably, IBL has demonstrated efficacy not only in traditional subjects but also in the realm of Foreign Language Education (Stepanechko & Kozub, 2022). More recent work in EFL settings has also shown that inquiry-based approaches may promote learner engagement, critical reflection, and socially grounded language learning beyond the development of discrete linguistic skills (Hoyos-Pipicano & España-Delgado, 2025).

Furthermore, inquiry learning is postulated to effectuate a transformative shift from a teacher-centered to a student-centered learning paradigm (Lebak & Tinsley, 2010). Successful navigation through diverse inquiry tasks mandates sustained learner engagement throughout the process. This methodological approach compels students to actively and systematically engage in critical analysis, logical investigation, and thoughtful problem-solving, culminating in independent decision-making prowess (Hu, Kuh & Li, 2008). The volume and nature of activities within the inquiry learning process not only gauge the depth of student engagement but also bear direct consequences on the development of cognitive processes and motivation to learn. However, some Asian educational contexts may exhibit reluctance among students to actively participate in inquiry-based tasks due to cultural norms favoring a more passive learning stance. Addressing these concerns, adaptations in the implementation of IBL can be made to accommodate cultural sensibilities and encourage engagement (Zhou, 2017). Consequently, the application of inquiry learning programs emerges as a potent instrument for enhancing critical thinking skills and nurturing motivation, especially within the thematic contours of 21st-century educational demands.

While extant literature extensively explores the merits of employing Inquiry-based techniques in education (Grant & Gradwell, 2010; Swan, Hofer & Swan, 2011; Thacker et al., 2018; Olbrys, 2019), with a particular focus on Second Language Acquisition, an apparent lacuna persists concerning the affective-emotional dimensions of these strategies within the domain of English Language Teaching (ELT). Predominantly concentrated on facets such as self-efficacy, competency development, and effective communication within team dynamics, prior research has regrettably marginalized the emotional component. Nevertheless, empirical evidence underscores the pivotal roles played by two emotional factors, namely Foreign Language Anxiety and Motivation, as both impediments and facilitators in the intricate process of language acquisition (Soleimani et al., 2020; Alrabai, 2022). Acknowledging the significance of motivation and anxiety in the ELT

sphere, this study endeavors to address this scholarly gap by scrutinizing the impact of Inquiry-based Learning on the motivation and anxiety levels of Spanish EFL learners, thereby gauging its potential contribution to enhancing the emotional facets of foreign language learning.

In the present study, a clear distinction is made between Inquiry-Based Learning (IBL) and Inquiry-Based Teaching (IBT), as these terms are often used interchangeably despite referring to different dimensions of the educational process. While IBT describes the pedagogical methods and instructional choices made by teachers to foster an inquiry-rich environment—such as the design of tasks, scaffolding strategies, and feedback mechanisms—IBL refers specifically to the students' active engagement in the learning process through questioning, exploration, and knowledge construction. In this research, the emphasis is placed exclusively on IBL, understood as the learner-centered process in which students formulate questions, conduct investigations, analyze information, and communicate results in a collaborative setting.

Procedurally, IBL in this study is operationalized through a structured eight-week intervention in which learners engaged in a full inquiry cycle, including initial question formulation, group research projects, oral presentations, and written reports. The focus was not on the teacher's instructional strategies per se, but rather on how students enacted inquiry as a learning strategy and how this participation affected their levels of motivation and anxiety. This distinction ensures a clear alignment with the study's affective focus and clarifies the scope of the intervention.

Review of Literature

Inquiry Based Learning

Inquiry-based Learning, as outlined by Lee (2014), is an innovative and continually evolving educational approach that places significant emphasis on actively acquiring knowledge and skills through the intentional act of asking questions and proactively seeking relevant information. This learning approach can be viewed as an enlightening exploration, where students are actively engaged in a diverse and intricate journey comprising several crucial stages: observing, questioning, investigating various resources, collecting, scrutinizing, deciphering, and amalgamating information, formulating responses and predictions, and ultimately, conveying discoveries through thoughtful dialogue and contemplation (Hsu, Lai & Hsu, 2015). A crucial aspect of this process is the application of novel information in real-life scenarios, fostering additional investigation. At its core, IBL encourages students to question, dispute, and explore various viewpoints and concepts within the tangible world (Bybee et al., 2006).

To comprehend this shift in educational ideology, one must assume that the 21st century demands a diverse range of abilities from the current generation. These include gathering and evaluating information, thinking critically, applying knowledge, analyzing data, understanding ideas, working together, and communicating effectively (Anjani, Suciati & Maridi, 2018). Departments of Education worldwide, including Spain through the new Education Law LOMLOE of 2020, have recently emphasized the importance of developing global educational skills like critical thinking, problem-solving, effective communication, and collaboration. The modern era demands individuals to possess a range of skills for success, such as cognitive and innovative capabilities, as well as interpersonal and intrapersonal competences, leadership and responsibility, productivity and inventive thinking, digital literacy, and proficient communication (Chu et al., 2016).

IBL is an innovative educational strategy that responds to these requirements and can be implemented in all academic fields and language proficiencies. With its roots grounded in scientific inquiry (Beach & Myers, 2001) and its application in language instruction, IBL presents a vibrant

and student-driven methodology that inspires active exploration and perpetual learning. Originally intended for scientific educational purposes, this didactic approach has become a valuable tool in language education in the last decades. In Rejeki's (2017) perspective, this strategy serves as a key factor in promoting lifelong learning capabilities in EFL students, enabling them to persistently pursue knowledge throughout their existence. It is important to distinguish between the strategies teachers implement to promote inquiry (IBT) and the learner-led process of engaging with inquiry itself (IBL), which is the focus of this study. Lee (2014) highlights the similarities between IBL and the Communicative Approach, stressing their compatibility. IBL aligns with the principles underlying Communicative Language Teaching, as both prioritize authentic, student-driven engagement with language. This method ultimately helps learners develop their communicative competence through active participation and real-life situations for language use (Chen, 2021).

IBL is always characterized by a structured scientific process, known as the inquiry cycle, which consists of a variety of interconnected phases that collectively complete the deductive learning process. Notable examples include the "5E learning cycle" or the "White and Frederiksen inquiry cycle", each integrating induction and deduction to culminate in a self-directed method of experimentation and discovery (Pedaste et al., 2015). A comprehensive IBL framework includes five general inquiry phases: Engagement, Exploration, Explanation, Elaboration, and Evaluation. This inclusive cycle, which covers aspects like questioning, observation, and reflection, serves as a versatile structure for teachers, similar to the approach used by professional researchers to construct knowledge.

Starting with Engagement, students confront conflicts between prior and scientific understanding, stimulating questions and assessing prior knowledge. Exploration follows, allowing students to work independently, ask questions, gather evidence, and collaborate. The explanation stage involves students articulating ideas, using evidence, and critically appraising explanations. Elaboration applies scientific concepts to new contexts, while Evaluation demands that students demonstrate understanding, self-assess, and engage in peer evaluation. Thus, the synthesis of IBL principles and their application in the different programs and phases selected exemplifies a dynamic and comprehensive approach to scientific discovery within an educational framework (Grant, Swan & Lee, 2017).

In the field of ELT, using inquiry-based strategies has been identified as a successful method for teaching various skills. For speaking instruction, "[IBL] prioritizes students' questions, ideas, and observations as the driving force behind the learning process. Teachers play an active role in facilitating this approach, fostering a culture of respectful challenges, experimentation, and ongoing refinement of ideas" (Scardamalia, 2002). As stated by the CBS (Capacity Building Series, 2013), this method shows potential in developing inquisitive, driven, cooperative, and creative students who are able to take part in their own investigations: "When students are given the freedom to select their own topics and are actively involved in speaking exercises, Inquiry-based Learning sparks their motivation and involvement."

IBL is also highly effective in teaching reading as it encourages students to investigate and analyze issues, concepts, or themes without predetermined solutions. Chu et al. (2011a & 2011b) conducted two case studies on elementary students in Hong Kong, using inquiry project-based learning to evaluate their knowledge of information resources. Additionally, they also assessed the students' attitudes towards reading ability and interests. The studies showed a clear improvement in students' information literacy skills following the project. Research has shown that implementing

IBL, particularly through the Engagement and Exploration methods, helps students develop the necessary reading strategies for an EFL curriculum (Ermawati, Yunus & Pammu, 2017).

When instructing writing, IBL is evident in the pre-writing tasks that require students to brainstorm, narrow down topics, gather information from different sources, and articulate their research findings. The existing literature suggests that utilizing inquiry-based writing instruction has a significant impact on students' critical thinking skills (Ghaemi & Mirsaeed, 2017; Wale & Bishaw, 2020). The promotion of analyzing, synthesizing, and evaluating concepts among students helps develop their critical thinking abilities and significantly improves their scores in writing performance tests.

In conclusion, research indicates that IBL has gained recognition for enhancing students' English performance as a second language in areas such as speaking (Fatkhriyah, 2019; Irawan, Syahrial & Sofyan, 2019), reading comprehension (Oktarani, 2015; Johnson & Cuevas, 2016), writing composition (Lessner & Craig, 2010; Ahmad et al., 2014), and even knowledge of the International Phonetic Alphabet (Blessinger & Carfora, 2014). Through hands-on experiences and facilitating connections with the outside world, research has demonstrated that IBL can enhance language acquisition in students, mirroring the process of learning their native language (Escalante Arauz, 2013; Lee, 2014).

Foreign Language Anxiety and Motivation

Foreign Language Anxiety, as defined by MacIntyre (1999), refers to a state of nervousness and apprehension associated with foreign or second language contexts, particularly in speaking and listening. This anxiety manifests as a negative emotional reaction when learning or using a foreign or second language. Scholars like Zhang (2001) emphasize that anxiety represents a psychological unease experienced by learners during language tasks. Krashen (1981) posited that this specific level of anxiety negatively impacts the learning of a foreign language.

Krashen's viewpoint suggests that the emotional state or attitude of language learners can function as an adjustable filter, influencing the acquisition process. According to the Affective Filter Hypothesis, a low filter, indicating lower anxiety levels and higher motivation, allows learners to receive more input and interact confidently, thereby facilitating language acquisition. The term Foreign Language Anxiety (FLA) was first introduced by Horwitz, Horwitz and Cope (1986), to describe a distinct phenomenon resulting from the unique nature of learning a foreign language, encompassing an individual's self-perception, beliefs, emotions, and behaviors within language learning environments.

Since the 1970s, the study of emotions, particularly language anxiety, has played a significant role in the realm of Second Language Acquisition. Initial studies yielded conflicting results, leading to the development of the Specialized Approach in FLA research. From the 90s, high levels of FLA have been identified as a barrier to L2 learning, while positive emotions and intrinsic motivation, extending beyond mere pleasant feelings, have been found to enhance learners' ability to notice language input, promote resilience, and foster exploration and play (MacIntyre & Gregersen, 2012).

Dewaele and MacIntyre (2014) introduced the Foreign Language Enjoyment (FLE) scale, closely related to the concept of motivation in L2, revealing a clear inverse relationship between FLE and FLA. Individuals with elevated FLE demonstrated a stronger aptitude for multiple languages, achieved a higher level of linguistic competence, and experienced reduced levels of anxiety. Positive classroom activities, such as debates and group presentations, significantly

contributed to improving FLE. The study also examined how FLA and FLE interact in second language acquisition, finding that increased enjoyment and reduced worry, coupled with improved confidence, are linked to enhanced performance on tests and exams.

Given the complex relationship between anxiety and L2 motivation, particularly intrinsic motivation, recent studies (Soleimani et al., 2020; Alrabai, 2022; Pawlak, Zarrinabadi & Mariusz, 2022; Manchado-Nieto & Fielden-Burns, 2024) emphasize the necessity of examining both negative and positive emotions concurrently, as essential aspects of learners' language acquisition journey. This perspective is reinforced by recent findings showing that foreign language anxiety coexists dynamically with other emotions, such as enjoyment and boredom, all of which are closely related to language learning outcomes (Li & Xing., 2024).

Anxiety in language learning, especially in the foreign language classroom, stems from various sources, including the difficulty level of classes, personal perceptions of language aptitude, personality traits, and stressful experiences. Young (1991) identified six potential sources of language anxiety, categorized into learners' personal and interpersonal anxiety, beliefs about language learning, instructors' beliefs, instructor-learner interactions, classroom procedures, and language testing. Cognitive components of anxiety, as highlighted by Eysenck (1979) in one of the seminal studies on the subject, involve worry and emotionality, impacting learners' working memory capacity.

Brown and Rosenkjar (1996), Cheng (2002), and Zhou (2016) found different levels of anxiety in various language learning situations, including writing, speaking, and learning new vocabulary. Pedagogical considerations for anxiety reduction include creating a supportive and non-threatening classroom environment, addressing learners' emotional states, and fostering positive emotional atmospheres. Teachers' anxiety-reducing strategies have been shown to significantly decrease learners' foreign language anxiety.

The complexity of language anxiety in the foreign language classroom necessitates exploring both negative and positive emotions in the learning process. Positive emotions, as highlighted by Dewaele (2015), play a crucial role in maintaining engagement and interest in language learning. Teachers play a central role in creating a positive emotional atmosphere through comprehensible discourse, verbal and non-verbal means, the promotion of group solidarity, and effective teaching techniques and methodologies. A relevant subject, along with the freedom for teachers to introduce engaging activities, is crucial for overcoming routine, boredom, and lack of engagement in language classes (Yang et al., 2024).

While numerous studies have supported the effectiveness of Inquiry-Based Learning (IBL) in developing linguistic skills—such as speaking, reading, and writing—there is a notable paucity of research examining its impact on affective dimensions in the context of English Language Teaching (ELT). Most existing literature has focused on the cognitive, collaborative, or communicative outcomes of IBL interventions (Chu et al., 2016; Grant et al., 2017), often neglecting the emotional experiences of learners engaging in these processes.

This gap is particularly relevant given the growing interest in the affective turn in Second Language Acquisition (SLA), where emotions are now considered central—not peripheral—to language development (Dewaele, 2015; MacIntyre & Gregersen, 2012). Within this paradigm, Foreign Language Anxiety (FLA) and L2 Motivation are among the most studied variables due to their strong predictive power over language performance and persistence (Horwitz et al., 1986; Alrabai, 2022; Pawlak et al., 2022). More recent frameworks such as Emotion Regulation Theory

and Positive Psychology in SLA have further emphasized the importance of fostering Foreign Language Enjoyment (FLE), emotional resilience, and self-regulatory strategies as buffers against anxiety and demotivation (Dewaele & MacIntyre, 2014; Bielak & Mystkowska-Wiertelak, 2024).

Despite these developments, little is known about how IBL—an approach that requires learners to engage in open-ended, cognitively demanding, and often socially mediated tasks—might influence learners' affective states. Given that inquiry inherently involves uncertainty, autonomy, and evaluation by peers, it may both challenge and empower learners emotionally. This study seeks to address that gap by exploring whether an IBL intervention can serve not only as a cognitive or linguistic scaffold, but also as an affective regulator that increases motivation and reduces anxiety in intermediate EFL learners.

By integrating IBL with recent insights from affective SLA research, this study positions itself at the intersection of learner-centered pedagogy and emotional well-being in foreign language education. It thereby contributes to ongoing discussions about how to create more emotionally supportive, motivating, and resilient learning environments.

METHODS

Study Design

This study employed a quasi-experimental approach and quantitative methodologies for data collection. The research design was based on a quasi-experimental method, specifically the pre-test/post-test model. The investigation involved a control group and an experimental group, with an IBL program acting as the independent variable. Meanwhile, Foreign Language Anxiety and Motivation served as dependent variables.

Participants

A cohort of 48 intermediate EFL students from the Pontifical University of Salamanca (Spain) participated in the study. They were selected from a larger pool of 94 students, all of whom had previously studied English for several years. The participants ranged in age from 19 to 31 years and included both male and female students; the final sample comprised 31 women (65%) and 17 men (35%). Although no formal measure of socioeconomic background was collected, all participants were enrolled in teacher education programs at the same public university, indicating a relatively homogenous educational context.

Participants were first assessed using the Oxford Quick Placement Test (OQPT) and only those scoring at the intermediate level were included. They were randomly assigned to experimental and control groups, with 24 students in each. Randomization ensured internal validity and minimized selection bias at the start of the intervention.

Instruments

Four tools were employed in this study. Initially, the entire group underwent the Oxford Quick Placement Test (OQPT) to establish a common baseline and ensure uniform proficiency levels among students. According to this assessment, students were classified as pre-intermediate, intermediate, or upper-intermediate. Only 48 students, classified as intermediate, were selected for the investigation.

Two additional instruments were surveys used for data collection. The Foreign Language Classroom Anxiety Scale (FLCAS), developed by Horwitz, Horwitz and Cope (1986), was slightly reworded for better alignment with participants' language abilities. Anxiety levels were measured

using a five-point Likert scale test, consisting of 33 items. The FLCAS questionnaire was administered as a pre-test to evaluate participants' anxiety levels before the IBL program implementation. Following the intervention, the FLCAS questionnaire was readministered to assess the program's impact on reducing student anxiety.

The second questionnaire was an AMTB survey, adapted from Gardner's international edition (1985), designed to assess motivation levels. Sixty-eight questions from the original test battery's 104 items were used to gauge students' attitudes towards foreign language learning settings and their inherent motivation. The AMTB was employed as a pre-test before the study and as a post-test after its completion.

The fourth tool was an *ad-hoc* designed Inquiry-based Learning Program, implemented with the experimental Group. Inspired by Beach and Myers' Inquiry-Based English Instruction model (2001: 15-99), this open inquiry learning approach aimed to enhance speaking and writing skills. The program spanned an eight-week period, equivalent to 32 hours of classroom work. During the eight-week IBL program, the experimental group engaged in a structured series of inquiry-based activities designed to enhance their language skills and reduce anxiety. Each week focused on a different aspect of language learning, starting with simple inquiries into everyday language usage and gradually advancing to more complex investigations into cultural nuances in language. Students were tasked with formulating their own questions, conducting research using a variety of sources, and presenting their findings in both written and oral formats. Collaborative projects were emphasized, allowing students to work in groups to foster a supportive learning environment. Teachers facilitated the process by providing resources, guiding research efforts, and offering feedback, but the primary initiative and direction of the learning activities were student-driven.

In this program, students initiated each unit with a KWL chart (What I know, What I want to know, What I learned), identifying existing knowledge and research questions. After conducting research independently or in groups, students presented their findings, formulated experimental questions, and devised methods. Following experiments, students finalized reports and shared their findings, allowing for peer evaluation and teacher guidance. The entire group summarized and discussed the main concepts of the inquiry learning process in classroom debates at the end of each session.

The FLCAS and AMTB were used in their adapted versions, and their scoring procedures are clarified here for transparency. The FLCAS consists of 33 items rated on a 5-point Likert scale (from 1 = strongly disagree to 5 = strongly agree), yielding a theoretical score range from 33 to 165. The AMTB adaptation included 68 items (out of the original 104), each rated on a 6-point Likert scale (from 1 = strongly disagree to 6 = strongly agree), resulting in a possible range from 68 to 408. The scores reported in the results section reflect the sum of all item responses, and the substantial increase in post-test scores (e.g., from 117 to 236) is therefore plausible given the cumulative nature of the scale. However, further normalization or reporting of subscale scores could be considered in future studies for more nuanced interpretation.

Procedure

Prior to the intervention, all participants completed the Oxford Quick Placement Test (OQPT), the Foreign Language Classroom Anxiety Scale (FLCAS), and the Attitude/Motivation Test Battery (AMTB) as pre-tests. The experimental group then participated in an eight-week Inquiry-Based Learning (IBL) program, while the control group followed conventional instruction.

After the intervention, all participants completed the same instruments as post-tests to measure changes in anxiety and motivation.

In addition to these affective measures, the study included direct assessments of students' productive language skills—speaking and writing—administered at both the beginning and end of the intervention period. Speaking was evaluated through structured oral interviews conducted by trained raters, who assessed learners' performance in terms of fluency, grammatical accuracy, lexical range, and discourse organization. Interviews were recorded and scored using standardized analytic rubrics aligned with CEFR descriptors.

Writing was assessed through two timed essay tasks, one before and one after the intervention. Participants responded to prompts that required them to express opinions, describe situations, or argue a position on familiar topics. Essays were evaluated independently by two qualified raters using an analytic scoring rubric that considered grammar, vocabulary, coherence, cohesion, and task completion. Discrepancies in scoring were resolved through consensus.

All assessments—both affective and linguistic—were administered under equivalent conditions before and after the program to ensure consistency and reliability of results. The data were analyzed using SPSS software, employing descriptive statistics, independent-samples t-tests, and one-way ANOVA. Results were presented in tables and discussed in relation to the research objectives.

FINDINGS AND DISCUSSION

The analysis of the data collection results explains the differences in foreign language anxiety and motivational levels of students who learned using inquiry-based strategies and conventional strategies. The details of the results and statistics are presented below.

A pre-test using the FLCAS test was conducted on all participants in both groups to determine their similarity. Following this, we conducted a one-way ANOVA to compare the mean scores of their responses. Table 1 indicates that the mean score for the control group was 61.85, while the experimental group had a mean score of 63.59. In order to determine the significance of the difference between the pre-tests of both groups, Table 2 displays the results of an independent sample *t*-test.

Table 1. *Descriptive statistics (FLCAS pre-test of Control and Experimental groups)*

	Group	N	Mean	Std. deviation	Std. error mean
Scores	Control	24	61.85	19.43	3.97
	Experimental	24	63.59	20.08	4.09

Table 2. *One-way ANOVA inferential statistics (after FLCAS pre-test of Control and Experimental groups)*

		Levene's test for equality of variances		t-test for equality of means				
		F	Sig.	*t*-value	Df	Sig. (2-tailed)	Mean difference	Std. error difference
Scores	Equal variances assumed	0.124	0.726	1.234	46	0.224	-1.74	1.41
	Equal variances not assumed			1.234	45.95	0.224	-174	1.41

The Sig. value in Table 2, which is 0.726, exceeds 0.05, suggesting that there is no significant disparity in anxiety pre-tests between the experimental and control group. Before commencing the treatment, it could be argued that both groups were experiencing similar levels of anxiety.

Upon the completion of the eight-week IBL program, both groups took a new post-test. According to Table 3, the average scores on the anxiety post-tests for the control and experimental groups are 64.32 and 118.56, respectively. Undoubtedly, the experimental participants outperformed their equals in the control group on the FLCAS post-test. In order to validate this statement, an independent sample *t-test* was utilized in a secondary one-way ANOVA test, as depicted in Table 4. According to the results in Table 4, the experimental group performed significantly better in the FLCAS anxiety post-test than the control group, as evidenced by the Sig. value (0.00) which is less than 0.05.

Table 3. *Descriptive statistics (FLCAS anxiety post-test of Control and Experimental groups)*

	Group	N	Mean	Std. deviation	Std. error mean
Scores	Control	24	64.32	19.03	3.88
	Experimental	24	118.56	14.64	2.98

Table 4. *One-way ANOVA inferential statistics (FLCAS anxiety post-test of Control and Experimental groups)*

		Levene's test for equality of variances		t-test for equality of means				
		F	Sig.	*t*-value	Df	Sig. (2-tailed)	Mean difference	Std. error difference
Scores	Equal variances assumed	1.488	0.229	14.488	46	<0.001	-54.24	3.109
	Equal variances not assumed			14.488	45.62	<0.001	-54.24	3.100

It seems evident that the IBL program's implementation had a positive impact on reducing the experimental group's anxiety level.

An AMTB survey was administered in alternate sessions before and after the experiment to evaluate participants' motivation in learning a second language. The pre-test results, shown in Table 5, reveal that the control group's mean score was 115.21, compared to 117.04 for the Experimental group. The mean scores on the motivation pre-tests seem to be almost equal for both groups, indicating that they had a similar level of motivation before receiving the treatment. The motivation pre-tests of the control and experimental groups were not significantly different, as revealed by the independent samples *t-test* results in Table 6. Their motivation levels were equal prior to implementing the IBL program.

Table 5. *Descriptive statistics (AMTB motivation pre-test of Control and Experimental groups)*

	Group	N	Mean	Std. deviation	Std. error mean
Scores	Control	24	115.21	12.93	2.64
	Experimental	24	117.04	13.34	2.72

Table 6. *One-way ANOVA inferential statistics (AMTB motivation pre-test of Control and Experimental groups)*

		Levene's test for equality of variances		t-test for equality of means				
		F	Sig.	*t*-value	Df	Sig. (2-tailed)	Mean difference	Std. error difference
Scores	Equal variances assumed	0.168	0.684	-0.128	46	0.889	-1.83	3.78
	Equal variances not assumed			-0.128	45.35	0.889	-1.83	3.78

According to the data in Table 7, the control group had an average score of 117.27 on the AMTB post-test, while the experimental group had an average score of 236.09. The experimental participants' motivation post-test scores were substantially higher after receiving the treatment. The significance of variations in motivation post-test scores was assessed using an independent samples ANOVA *t-test*. The results in Table 8 indicate that the disparities between both groups are substantial at ($p < 0.05$) because Sig. (0.00) is lower than 0.05. The control group was surpassed by the experimental group in terms of motivation in the post-test. This improvement may be associated with the implementation of the IBL program.

To complement the statistical significance results, effect sizes were calculated to assess the magnitude of the observed differences. For the FLCAS post-test results, the independent-samples t-test yielded a Cohen's d of 2.86, indicating a large effect of the IBL intervention on reducing foreign language anxiety. Similarly, for the AMTB motivation post-test, Cohen's d was 2.41, also representing a large effect. These values suggest that the differences between the experimental and control groups are not only statistically significant, but may also be pedagogically relevant.

Table 7. *Descriptive statistics (AMTB motivation post-test of Control and Experimental groups)*

	Group	N	Mean	Std. deviation	Std. error mean
Scores	Control	24	117.27	26.89	5.48
	Experimental	24	236.09	36.43	7.42

Table 8. *Inferential statistics (AMTB motivation post-test of Control and Experimental groups)*

		Levene's test for equality of variances		t-test for equality of means				
		F	Sig.	*t*-value	Df	Sig. (2-tailed)	Mean difference	Std. error difference
Scores	Equal variances assumed	2.794	0.101	-7.936	46	<0.001	-118.82	14.99
	Equal variances not assumed			-7.936	45.28	<0.001	-118.82	14.90

The main finding of this study is that the Inquiry-Based Learning intervention was associated with lower levels of foreign language anxiety and higher levels of motivation in the experimental group. In the realm of second language education, student motivation and the mitigation of anxiety are pivotal in shaping their engagement in daily learning tasks and activities. The decision-making process of students, whether conscious or subconscious, regarding the allocation of energy and attention, is influenced by factors such as confidence in achieving success, autonomy level, interest in the task, and perceived readiness to tackle it. Through IBL, students' expectations are deliberately realigned to prioritize exploration, open-mindedness, and iterative trial and error as integral components of the learning process.

These findings are consistent with previous research on Inquiry-Based Learning and learner affect. The results of the data analysis undertaken indicate that IBL practices appeared to reduce foreign language anxiety and fear of failure by embracing failure as a valuable facet of the learning process. Furthermore, these findings suggest that students exposed to second language learning through inquiry strategies exhibit heightened motivation compared to their counterparts subjected to conventional methods. This heightened motivation may be attributed to the active involvement of students in learning activities, making the educational process more memorable (Tuan et al., 2005). These survey outcomes align with prior research in diverse fields, indicating that students engaging in IBL consistently manifest higher motivation levels than those employing conventional approaches. In disciplines such as nursing, physics, or mathematics education, Kirwan and Adams (2009), Mountrakis and Triantakonstantis (2012), or Fielding-Wells, O'Brien and Makar (2017) and Bayram et al. (2018), respectively, underscored "the potential of IBL to generate high levels of motivation to commit to a task" (Fielding-Wells, O'Brien & Makar, 2017: 251). Similarly, Moote, Williams and Sproule (2013) emphasized the program's potential to enhance students' self-regulation and motivation in a science and technology program, leading to reduced test anxiety and increased commitment. In a parallel vein, Østergaard (2016) conducted a study on IBL implementation in Physical Education classes, revealing enhanced student engagement and a significant boost in motivation through peer interaction.

Guided inquiry learning strategies, particularly in teaching second languages, prove beneficial in reducing language anxiety among college students. Guided discovery, suitable for students at this developmental stage, allows teachers to act as motivators and facilitators, promoting autonomy, engagement, and motivation. IBL empowers students to determine goals, topics, and learning approaches, actively fostering confidence through teacher assistance, group work, and hands-on experiences to enhance motivation and cognitive involvement (Spronken-Smith, 2012).

Informal interactions and conversations with students, not structured as interviews, underscored students' appreciation for the control this approach granted them over their learning journey. As described in the experimental IBL program, students had the opportunity to choose topics, define problems, devise testing solutions, and construct logical arguments for both successful and unsuccessful attempts. Beyond didactic engagement, this aspect supported the development of strong communicative and collaborative competencies with peers, positively impacting anxiety levels, as evidenced by previous studies. Additionally, the potential for extending learning beyond the original activity scope contributes to heightened motivation levels, as explored earlier (Laxman, 2013). Several justifications, rooted in the affective dimension, support the use of IBL in a second language classroom.

The integration of this methodology in the teaching process may also influence related affective or cognitive elements. Hong et al. (2017) found that employing IBL strategies via digital platforms increased interest in learning science, reduced cognitive anxiety and extraneous cognitive load, and boosted self-confidence. The correlation of some of these variables with anxiety and motivation levels has been established in prior studies (Stankov, Lee & Paek, 2009; van Gog et al., 2009).

While these findings hold promise, the study's limitations, based on data from a single faculty and university, necessitate further experiments in diverse settings. Challenges, including categorizing students' learning styles, providing hints and feedback, and addressing varying levels of difficulty in language issues, should be addressed in future studies. Despite the constraints of this quasi-experimental study, the findings point to the value of further exploring Inquiry-Based Learning in ESL education among teachers and policymakers. Given the relatively small sample size (n = 48), these findings should be interpreted with appropriate caution, although the large effect sizes lend support to the observed patterns. Future studies may incorporate larger samples, full confidence interval reporting, and multivariate analyses to further substantiate these results.

From a pedagogical perspective, these findings suggest several implications for second language teaching in higher education. The success of higher education students in a second language is intricately tied to their intrinsic motivation and anxiety levels. Therefore, a well-conceived teaching design is imperative to optimize their learning abilities. The inquiry learning model, as discussed by Hu, Kuh and Li (2008), aims to cultivate students' scientific skills and motivation by actively involving them in their learning. Students with high motivation tend to pay more attention to lessons and maintain focus during the learning process, whereas those with low motivation and high foreign language anxiety may struggle to concentrate. This is evident in the behavior of hesitant students who are reluctant to ask questions or express thoughts when facing learning difficulties. The lack of motivation adversely affects students' enthusiasm for learning both at home and in school (Liu & Huang, 2011). In conclusion, based on the results and discussion, the findings suggest that emotional barriers for students learning through inquiry strategies are lower compared to students employing conventional strategies.

CONCLUSION

This study targeted certain aspects of motivation and classroom anxiety associated with speaking and writing skills in an EFL context. Regarding motivation, the Inquiry-Based Learning program focused on enhancing learners' intrinsic motivation by engaging them in meaningful communication tasks that require active participation and personal investment. This approach was designed to increase their enthusiasm for learning and their willingness to engage in language practice more frequently and with greater determination.

In terms of classroom anxiety, the program specifically aimed to reduce performance anxiety, which is commonly experienced during speaking and writing tasks. By providing a supportive environment where students could explore language use without fear of immediate correction or criticism, the program helped students feel more comfortable and less anxious about making mistakes. This was particularly evident during collaborative projects and peer feedback sessions, which encouraged a more relaxed and accepting atmosphere conducive to language experimentation.

This research, focusing on English as a Second Language and examining students' engagement in Inquiry-Based Learning processes, differs from previous studies by specifically exploring the relationship between foreign language anxiety, motivation, and learning through inquiry-oriented instruction. In summary, this study contributes to the existing literature by showing that Inquiry-Based Learning may be relevant not only for linguistic development, but also for addressing affective variables in university EFL contexts. Its pedagogical impact lies in supporting the design of more engaging, participatory, and emotionally supportive language learning environments.

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