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# Surveying the Obstacles to Effective English Communication in Physics Tutorials

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**ABSTRACT**

**Purpose of the study:** This study aims to describe how English is used to support communication during physics tutorial activities and to analyze the linguistic, psychological, and environmental factors that hinder effective communication among students during English-medium physics tutorials.

**Methodology:** This study used a descriptive survey design involving 50 physics students. Data were collected through a 50-item Likert-scale questionnaire developed based on theoretical frameworks in language learning and science education. All responses were processed using descriptive statistical techniques in *Microsoft Excel* to identify dominant linguistic, psychological, and environmental communication barriers.

**Main Findings:** The results of the study show that psychological barriers, especially anxiety when speaking, fear of making mistakes, and lack of confidence, are the biggest obstacles in the communication process. In addition, there are also linguistic challenges, such as limited technical vocabulary and difficulty in accurately formulating scientific expressions. Environmental factors, including the speed of delivery and lack of language support, further exacerbate these communication difficulties.

**Novelty/Originality of this study:** This study conducts an in-depth analysis of communication barriers in physics tutorial activities, a context that has been previously under-discussed in the literature. By integrating linguistic, psychological, and environmental perspectives, this study presents new empirical findings that can enrich more inclusive pedagogical practices and support the development of science learning strategies that use English as the medium.



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## 1. INTRODUCTION

As the language of science and the primary medium of global scientific communication, English is the main language in the fields of science and technology. This is because sometimes the language of science and technology presents an open communication channel that is entirely focused on English, resulting in collaboration with scientists across all places of activity and distribution of research results, as well as initiatives that can contribute to the approach of this strategy and the transformation of Sky-change and Paradis-transfer in practice [1]. For instance, according to Drubbin, & Kellogg [2] the emergence of a fundamentally the same scientific international language permeates intersubjective relations. Thus, the authors note that researchers and practitioners from all countries can familiarise themselves with the literature and conduct activities within a single coordinate system. The aspect creates other opportunities for people to interact within the international scientific framework and advances the field.

In physics education, the use of English reflects its vital role in facilitating the clear articulation of concepts in scientific environments. Qamariah & Yuliani [3] state This is because English enables these functions to be articulated from shared international scientific resources, fosters cross-border partnerships, strengthens speaking and writing skills, and promotes the efficient dissemination of global knowledge. Samosir & Suana [4] emphasise that students can convey their ideas and knowledge scientifically through writing, especially when compiling reports on experimental results in student workbooks. In addition, reading skills are critical for students to find and understand data related to physics topics studied in English, as well as to understand the contents of student workbooks and exam questions. In conclusion, English language skills have a positive and significant impact on physics learning outcomes, stemming from language's role as a communication tool in the context of science.

Active engagement forms a key element in supporting collaborative learning during physics tutorial activities. To promote the exchange of ideas both among students and between learners and instructors, researchers have adopted the *Class Talk* model. This approach emphasizes the use of questioning techniques designed to trigger meaningful discussion in small groups as well as in whole-class interactions on various physics topics [5]. Moreover, Katz et al. [6] point out that the actual value of a tutorial does not rest on the specific actions taken by tutors or students, but on how consistently and meaningfully they respond to one another throughout the conversation, an indicator of the depth of academic engagement occurring in the learning process.

Difficulty communicating in English is one of the main challenges in implementing physics tutorials. In the process of learning English, vocabulary mastery develops gradually, starting with common everyday words, progressing to more specific vocabulary, and eventually reaching technical terms in certain fields. A lack of understanding of physics terms in English, for example, when the term "inclined plane" is misinterpreted as "airplane", can create significant obstacles in scientific communication [3]. According to Zeidan et al. [7] Learning a second language often causes difficulties in understanding questions because they use scientific language unfamiliar to them, making it difficult to interpret words with multiple meanings. As a result, if students do not understand the words in the questions, they cannot form a mental image, whereas solving physics problems requires considerable effort to create a mental representation of the situation. Most errors in physics assessment stem from selecting the wrong equations and placing information in the wrong places. Suarez and Otero [8] point out that linguistic variation can affect the accuracy of evaluating students' conceptual understanding in physics. At the same time, the complex writing style in physics materials also reduces reading ability and academic achievement, causing frustration, and ultimately reinforces the perception that physics is a complex subject students tend to avoid.

Several studies have proven that English communication is essential in education given the expansion of international perspective and growing international engagement in various education fields. Additionally, English has become a leading language of communication and academic research across the globe. Therefore, English helps foster understanding, enhance scholarly interaction, and collaboration between educators from diverse cultural and linguistic backgrounds. This study shows that the use of technical terms is a common practice in scientific writing, which, in turn, provides significant benefits for English learners, especially those with careers in academia who are required to publish their research results in international journals [9]. Balan [10] states that most indexed scientific journals, even those originally published in languages other than English, have now switched to English. This choice is driven by the desire to reach a wider international audience and increase popularity, as well as to achieve greater impact by increasing citation counts.

Research on the use of English in physics education shows that English proficiency affects students' conceptual understanding and participation in physics. Previous studies show that using active sentences and simplified English when formulating physics questions significantly improves students' ability to visualize problems and achieve higher scores. Preparatory-level students, who generally have lower English proficiency than undergraduate students, benefit more from this language change [11]. Samosir & Suana [4] found that English language learners *(ELL)* engaged in activities where they could write and construct arguments based on evidence from diverse authentic experiences tended to develop productive disciplinary engagement, while improving their language skills and contextual understanding. In conclusion, language disorders have a direct bearing on students' ability to demonstrate their comprehension of physics concepts, even after they acquire the fundamental knowledge. Also, the appropriate learning space and attentiveness to linguistic needs can boost student participation.

The research results show that various communication barriers among students affect the effectiveness of interactions in the learning process. In the school context, these barriers pose a significant problem because they can reduce academic performance and create tension and conflict in classroom interactions. The other dimension of anxiety is the actual aversion or dissatisfaction with a given result, called the non-affective dimension. Misunderstanding of this emotional dimension harms learning outcomes and leads to long-term difficulties in academic, social, and emotional relationships [12]. Fahroni [13] stated that communication barriers between lecturers and students can reduce the effectiveness of interactions, so that learning objectives are not achieved optimally. Therefore, implementing good communication during the learning process is a crucial component in improving the quality of education. In contrast, the use of information technology and learning media can strengthen the effectiveness of communication in the educational environment. Educators are expected to build an interactive and conducive learning atmosphere to support the achievement of educational goals by paying attention to the roles and characteristics of the communicators involved, the communicant, and the message. Another study by Ennin and Manariyo [14] finds that language acts as a barrier to communication, where the semantic barrier causes misunderstanding between students and, therefore, difficulties in understanding the material, the mechanical barrier disrupts and causes difficulties in understanding the presented materials, and the ecological barrier disrupts the focus and motivation of students during the learning process. In addition, sociopsychological barriers include various difficulties, such as difficulty understanding teacher explanations, reluctance to ask questions, distractions, reliance on guesswork, and decreased motivation to learn. Research by Syed et al. [15] shows that most students face psychological barriers as well as other communication challenges. The biggest problem is not only a lack of speaking and listening skills, but also low self-confidence, anxiety, and shyness, triggered by the presence of many highly competent peers, as well as the discriminatory behaviour of lecturers. This ultimately leads to feelings of inferiority and reluctance to participate, thereby limiting students' communication fluency and affecting their overall motivation and academic achievement.

The research gap regarding English language communication barriers in physics tutorials underscores the need for further investigation. Although several previous studies have examined the function of English as a means of communication in the natural sciences [1]-[2] and emphasised the impact of English proficiency on students' conceptual understanding and engagement in physics learning [11]-[4], Research specifically examining English-language communication difficulties in the context of physics tutorials is still limited. Most previous studies have focused on general classroom interactions or communication barriers in education more broadly [12]-[13]-[14], without examining in depth how these barriers emerge in physics tutorial sessions, where students are required to discuss, explain concepts, and collaborate actively using English. As a result, there is a knowledge gap regarding the types and origins of English communication barriers students encounter during physics tutorial activities. Therefore, this study aims to close this gap through a questionnaire-based survey to identify and classify barriers to effective English communication in a physics tutorial environment.

A survey of 50 participants in an English-language physics tutorial revealed that English communication skills remain a significant challenge in the learning process. Most participants reported difficulty interpreting instructions, articulating physics ideas, and responding to questions during discussions, which in some pairs resulted in decreased participation and active interaction in the tutorial. These barriers indicate that the use of English in the tutorial environment disrupts the smooth flow of interactions and impairs the quality of student collaboration.

Misunderstandings in physics because of language mostly occur because students have insufficiently deep knowledge. As teachers use professional terms and build complex sentences to articulate their thoughts, students tend to grasp the main idea but make mistakes in the details. This situation indicates that barriers in English are not only related to limited vocabulary but also to the ability to understand the context of scientific communication fully. Therefore, in-depth research into the types and origins of English communication barriers in physics tutorials is important for designing more efficient learning approaches to help students develop scientific communication skills.

Although previous studies generally emphasize the importance of English language proficiency in science education and its impact on students' conceptual understanding and academic participation [4], [11]. Most of these studies focus more on the overall classroom teaching process, evaluation situations, or written scientific assignments. Research on communication barriers typically examines the general educational context or separate aspects, such as linguistic [7], psychological [15], or environmental [14] elements, without being able to explore the relationship between these elements in interactive learning settings specific to a particular subject area. In physics tutorials, students are expected to develop shared understanding, express abstract ideas, and collaborate using English. The communication demands in this context are fundamentally different from those of conventional face-to-face lectures and written assessments. However, empirical studies that systematically identify the types, sources, and levels of dominance of English-language communication difficulties in the context of physics tutorials are still relatively limited. Therefore, integrative research is needed to capture and understand the complex communication dynamics that occur in English-language physics tutorials.

This study attempts to bridge this gap by applying a context-oriented, integrative approach to examining barriers to English-language communication in physics education. By focusing on physics tutorial sessions and simultaneously analyzing linguistic, psychological, and environmental aspects, this study presents original empirical findings on how these three dimensions jointly limit students' communicative participation. Building on established theories in second language acquisition and educational communication [19], [21], [22], this study successfully uncovers dominant patterns of barriers that have not been widely reported in previous studies on physics education. The need for this investigation is growing as English increasingly serves as the medium of instruction in science programs at higher education institutions, particularly in non-English-speaking environments [2], [10]. Without a thorough understanding of the communication barriers in physics tutorial activities, student interaction and participation can be significantly limited, even among those who have mastered the concepts. Therefore, the findings of this study are expected to provide a foundation for developing more inclusive learning strategies that balance scientific rigor and provide appropriate language support in English-language physics education.

Theoretical approaches to communication in English in educational contexts highlight the crucial role of communicative competence as the foundation for productive academic exchange. Building on this idea, Richards and Rodgers [16] proposed Communicative Language Teaching (CLT) as a learning method that emphasises engagement, meaning-making, and meaningful language use, making it particularly useful for classroom interactions such as physics tutorial sessions, where students are expected to present their arguments and share ideas. Recent research reinforces this classical view. Whyte [17] defines that communicative competence still has an important role in subject-based education. According to Liao [18], the principles of Communicative Language Teaching (CLT) remain the primary foundation of modern language teaching practice.

Theories of communication barriers in the learning process emphasize that difficulties in educational communication arise when elements of the communication process do not function efficiently. Based on the SMCR model developed by Berlo [19], communication barriers can arise at the source, message, channel, or receiver level, especially when learners have inadequate language skills or when the material being conveyed is not explained in detail. The latest development of Berlo's model, as described by Vanessa and her colleagues [20] in Educational Communications and Technology: Issues and Innovations, shows that today's learning environment poses additional barriers related to the use of digital channels, media diversity, and technological skills. These factors can further affect the clarity of information delivery and reception in education. In addition, Gamble and Gamble [21] state that psychological factors—such as anxiety, lack of confidence, and concerns about misunderstanding—as well as semantic barriers arising from ambiguous meanings or unfamiliar terminology, can significantly hinder learners' ability to understand and convey ideas during the learning process. Overall, this theoretical approach provides an important foundation for understanding the interaction between linguistic elements, psychological conditions, and technological requirements, which ultimately can reduce the effectiveness of communication in physics tutorial sessions conducted in English.

The theoretical view of communication in foreign languages states that active participation in English-language physics tutorials is not only determined by linguistic ability, but is also influenced by participants' motivation and their strategic skills in participating in learning interactions. The concept of "Willingness to Communicate" described by Peng [22] indicates that students may be reluctant to speak due to anxiety, lack of confidence, or the perception that communication is risky, even though they understand the physics material well. Additional findings come from recent research on communication competence presented by Kanwit & Solon [23]. This study developed a competency model that emphasizes the importance of pragmatic, discursive, and strategic abilities in the learning interaction process, which includes the skills of asking questions, negotiating to reach understanding, and formulating and presenting arguments. Overall, this perspective explains why physics students often have difficulty expressing ideas or participating actively in English, even though they actually understand the learning concepts well. Based on the background above, this research has two objectives. First, this study aims to explain the use of English in physics tutorial activities. Second, it aims to analyze the factors that hinder effective communication in these activities.

## 2. RESEARCH METHOD

In order to methodically examine barriers to efficient English communication during physics tutorial sessions, this study used a descriptive survey approach. This method was chosen because it allows researchers to get standardised data from a sample population, providing insights into attitudes, perceptions, and prevalent situations [27]. Although this method is useful for finding patterns and connections in actual educational settings [28], it has inherent drawbacks. The approach does not prove causal linkages or reflect the depth of qualitative experience, and the results are limited by the single-institution setting and sample size, which impact generalisability.

The study involved fifty Syarif Hidayatullah State Islamic University Jakarta physics students engaged in English-medium tutoring sessions. Purposive sampling, which enables researchers to specifically pick people with particular characteristics or experiences relevant to the study topics, was used to select participants [29]. Every responder had completed at least two semesters of English-language physics tutorials and showed a high level of familiarity with tutorial settings where English was the primary teaching language. By encouraging consistency in the contextual experiences of participants, this sampling criteria increased the validity and reliability of the results, strengthening their trustworthiness. Fraenkel et al. [30] emphasize that purposive sampling is particularly helpful when researchers need to choose cases with rich information that can offer in-depth insights into the topic being studied. The participant group consisted of 20 male and 30 female students, aged 19 to 23, all of whom had completed required English proficiency courses as part of their program. While this sample size provides valuable insights, it represents a limitation in terms of generalizability to broader populations.

A thorough 50-item questionnaire created utilizing reputable theoretical frameworks in scientific communication and second language acquisition served as the primary study tool [24]. A methodical methodology was used to create the questionnaire. Items were first written after a careful examination of pertinent literature. Three applied linguistics specialists then evaluated the text to make sure it was clear and relevant. Before completing the questions based on the results of a reliability evaluation, the instrument was piloted with a small group of fifteen students to uncover possible problems. The final instrument demonstrated excellent internal consistency with a Cronbach's alpha coefficient of 0.87, meeting established standards for educational research tools [31].

The questionnaire covered four theoretically grounded areas: instructional approaches (12 items), contextual elements (13 items), psychological traits (13 items), and linguistic knowledge (12 items). These domains were created in accordance with significant theoretical frameworks: instructional strategies and contextual elements mirrored Berlo's SMCR communication model [19], psychological traits operationalized the Willingness to Communicate theory [22], and language knowledge items were influenced by Communicative Language Teaching principles [16]. A five-point Likert scale, from "Strongly Disagree" (1) to "Strongly Agree" (5), was used by participants to score their answers. Dörnyei and Taguchi [32] claim that this scaling technique allows for both quantitative analysis and the nuanced assessment of attitudes and perceptions. The instrument was specifically designed to minimize ambiguity and social desirability bias, capturing all potential communication barriers from students' perspectives.

During the second semester of the 2023–2024 school year, data was collected using a standard technique. All fifty participants in the study concurrently completed an online survey using Google Forms as part of a single-phase, cross-sectional design. In order to increase participant access, decrease administrative paperwork, and speed up response processing, this digital platform was selected [33]. An informed consent statement that stressed voluntary involvement, provided a clear explanation of the study's goal, and ensured respondent anonymity was used to carefully handle ethical issues. All participants completed the questionnaire completely, yielding a 100% response rate. Consistent follow-up reminders and the purposeful administration of the instrument within scheduled teaching sessions helped to achieve this result. A full response rate significantly improves the validity and generalizability of survey results and effectively removes non-response bias, as observed by Creswell and Creswell [34].

Microsoft Excel's descriptive statistical methods were used to examine the data, and SPSS version 26 was used for validation. Data purification and validation, descriptive statistical computation, pattern detection, and results interpretation were the four structured stages of the analytical process. Primary analysis involved computing frequency distributions, mean scores, standard deviations, and percentages to compile participant responses and identify important trends. According to Pallant [35], descriptive results provide a basic understanding of data distribution and key patterns, serving as an essential first step in understanding complex educational difficulties. In order to measure the severity and frequency of communication problems within the four domains under consideration, particular emphasis was paid to items with high endorsement levels (over 70%) and those showing notable fluctuation. This approach produced a thorough statistical picture of the communication challenges physics students faced in English-medium tutorials and made it possible to identify possible links between various barrier kinds.

## 3. RESULTS AND DISCUSSION

### 3.1 Overview of Communication Barriers

The results of the study showed that students faced significant communication obstacles in three key areas: linguistic, psychological, and environmental. According to Table 1, psychological barriers had the greatest mean agreement score (3.64), indicating that anxiety and motivational problems were the biggest obstacles. With a mean score of 3.41, linguistic hurdles came next, indicating substantial difficulties with sentence construction and vocabulary acquisition. Although still significant, environmental factors had a considerably lower mean score

(3.31), indicating that personal and language limitations had a bigger impact on communication than external factors.

Table 1. Response Frequencies by Category

| Category | Strongly Disagree | Strongly Agree | Average Score |
|---|---|---|---|
| Linguistic Barriers | 8.2% | 16.5% | 3.41 |
| Psychological Barriers | 5.4% | 21.9% | 3.64 |
| Environmental Barriers | 9.7% | 17.0% | 3.31 |

According to recent studies on language anxiety in academic settings, psychological barriers were shown to be the most common difficulty. According to Kostikova et al. [25], psychological issues are often the main obstacles to conversational engagement for ESL students. The high mean score for psychological obstacles (3.64) in this physics tutorial context highlights the need for focused treatments that address emotive variables in scientific communication, extending earlier findings from general language learning contexts to discipline-specific settings.

Table 2. Specific Communication Challenges with High Agreement Rates

| Category | Item No. | Specific Challenge Description | Agreement Rate (%) |
|---|---|---|---|
| Psychological Barriers | 31 | Feeling nervous when speaking or answering in English. | 86% |
| Psychological Barriers | 32 | Fear of making mistakes when using physics terms. | 84% |
| Psychological Barriers | 33 | Lack of confidence to ask questions. | 82% |
| Psychological Barriers | 38 | Preference for silence even when confused. | 80% |
| Linguistic Barriers | 2 | Understanding technical terms used in physics. | 82% |
| Linguistic Barriers | 7 | Confusion when similar terminology is used in different contexts. | 78% |
| Linguistic Barriers | 4 | Difficulty distinguishing explanation sentences from command phrases in physics texts. | 78% |
| Linguistic Barriers | 5 | Difficulty comprehending conditional clauses (if, except, when) in instructions. | 76% |
| Linguistic Barriers | 6 | Difficulty comprehending phrases like 'in order to' or 'so that'. | 74% |
| Environmental Barriers | 41 | Instructors rarely provide clear demonstrations. | 85% |
| Environmental Barriers | 42 | Materials too text-dense with few visuals. | 83% |
| Environmental Barriers | 45 | No glossary of technical terms is provided at the beginning of activities. | 80% |
| Environmental Barriers | 46 | No time is allocated to discuss English term definitions before practice. | 78% |
| Environmental Barriers | 47 | The classroom environment does not motivate students to actively use English. | 76% |
| Environmental Barriers | 36 | Becoming less focused due to fast-paced instructions. | 72% |
| Environmental Barriers | 9 | Instructor speaking too quickly makes it hard to understand. | 72% |

### 3.2 Linguistic Barriers: Beyond Vocabulary Limitations

Students' difficulties went beyond a lack of vocabulary, according to a more detailed analysis of language hurdles. While 82% of participants reported difficulty understanding technical jargon (Item 2), a sizable portion (78%) also reported difficulty differentiating between explanatory remarks and directive instructions in physics texts (Item 4). Instead of focusing only on lexical knowledge, this pattern suggests more general difficulties with functional language comprehension. Structural elements presented serious difficulties: 76% of students said they had trouble understanding conditional clauses (if, unless, when) in instructions (Item 5), and 74% said they had trouble understanding purpose clauses that included "in order to" or "so that" (Item 6).

These results suggest that students' challenges go beyond lexical constraints to include syntactic and pragmatic aspects of scientific English. This is consistent with study by Shubani and Mavuru [24], who discovered that scientific students learning English as a second language frequently had difficulty with the intricate grammatical patterns typical of academic speech. Since these constructs are commonly used in physics problem statements and experimental protocols, the particular difficulties with conditional and purpose clauses (Items 5–6) are especially significant.

### 3.3 Psychological Barriers: The Anxiety-Participation Cycle

Communication was most significantly impacted by psychological obstacles. Remarkably, 86% of students said they felt anxious while communicating in English (Item 31), and 84% said they were afraid to use physics terminology incorrectly (Item 32). Furthermore, even when perplexed, 80% chose quiet (Item 38) and 82% lacked the confidence to ask enquiries (Item 33).

According to the Willingness to Communicate hypothesis [22], these findings show a crippling cycle in which worry prevents involvement, which restricts language practice and feeds anxiety. Previous findings from general language learning contexts [15] are extended by the high incidence of psychological obstacles in this physics tutorial context, emphasising the necessity of focused treatments in discipline-specific settings. Psychological obstacles may be a direct cause of lower communicative participation in tutorials, as seen by the substantial correlation between speaking anxiety (86%) and preference for quiet (80%).

### 3.4 Environmental Barriers: Insufficient Support Structures

Communication problems were greatly made worse by environmental circumstances. The most common problems were: the lack of technical term glossaries (80%, Item 45), the excessively text-heavy materials with inadequate visuals (83%, Item 42), the instructors' infrequent provision of clear demonstrations in simple English (85%, Item 41), and the lack of time set aside for discussing definitions of English terms prior to practice (78%, Item 46).

The results show a stark contrast between the help now provided in tutorial settings and the intended goals of English-medium instruction. According to Gomes [26], insufficient academic scaffolding can have a detrimental effect on students' learning performance and overall wellbeing in English-dominated contexts. These results raise important questions about the efficacy of immersion techniques in the absence of sufficient support systems. Additionally, the high levels of agreement on items pertaining to environmental restrictions (Items 41, 42, 45, and 46) imply that current teaching methods may not be sufficient to give children the multimodal support they require to successfully manage language-related demands.

### 3.5 Interconnected Nature of Communication Barriers

Students faced more difficulties as a result of the substantial links between the three types of obstacles. Psychological concern about speaking (86%, Item 31) was exacerbated by contextual variables such fast-paced teaching (72%, Item 36) and a lack of vocabulary help (80%, Item 45) in addition to linguistic challenges with technical terminology (82%, Item 2). This connection supports the comprehensive analytical method used in this work by indicating that isolated therapies focussing on just one variable may have limited efficacy.

These findings have important implications for how physics education is constructed. First, they question the concept that language development in discipline-specific academic settings can only be accomplished through complete immersion. Instead, the findings indicate a scaffolded instructional technique in which subject instruction is purposely coupled with targeted language assistance. The findings also emphasise the need for continued professional development, which improves teachers' capacity to offer linguistically accessible explanations while simultaneously providing psychologically beneficial learning environments. Finally, the findings highlight the need of revamping lesson plans to incorporate opportunities for low-risk language practice, systematic pre-instruction of essential concepts, and multimodal learning resources.

### 3.6 Pedagogical Implications for Tutorial Redesign

Physics instructional design has to be rethought in light of the interrelated obstacles found in this study. Tutorials should focus on fostering a low-anxiety environment through organised, low-stakes speaking chances and feedback that prioritises communicative effort over perfect expression in order to reduce psychological barriers. Concurrently, discipline-specific lexical and grammatical teaching must be included into the instructional fabric in order to actively assist language growth. This may be accomplished by employing visual glossaries to pre-teach key terms and by offering sentence structures that support the creation of precise scientific explanations.

Additionally, the educational environment itself needs to be carefully calibrated. To minimise emotional filters, teachers could use multimodal assistance, modify their pace, and create small-group interactions. In the end, the most successful strategy is an integrated one, in which exercises are deliberately designed to concurrently increase language proficiency, promote psychological safety, and take use of a supportive setting. This all-encompassing approach guarantees that language development is a natural consequence of participating in real, well-supported physics conversation rather than an isolated objective.

There are a number of limitations to this study that should be noted. Although sufficient for descriptive analysis, the sample size of 50 students restricts generalisability to larger groups. The findings' applicability in different contexts may be impacted by the single-institution emphasis and particular cultural background. Furthermore, the use of self-reported data raises the possibility of response biases, although these were lessened by the instrument's design and anonymity guarantee. Although the cross-sectional design gives an overview of obstacles, it is unable to document how they have changed over time.

Larger-scale, multi-institutional studies and mixed-methods techniques that include classroom observations or interviews might be used in future research to solve these constraints. Studies that follow the development of communication obstacles over time might offer important new perspectives on their dynamics. It may be possible to determine if the trends found are exclusive to physics or prevalent in other STEM subjects by conducting comparative studies across disciplines. Improving practice would be directly impacted by intervention studies that evaluate certain instructional approaches for lowering these obstacles. Furthermore, studies that look at the connection between learning outcomes and communication hurdles would support the need for focused interventions.

## 4. CONCLUSION

The objectives formulated in the introduction have been achieved, as seen from the findings of this study. The analysis indicates that English plays an important role in supporting communication during physics tutorials. However, the findings also show that language barriers, psychological factors, and environmental conditions that interact with each other are significant obstacles to student participation. Among these obstacles, psychological factors, especially anxiety and fear of making mistakes, appear to be the most dominant aspects. Difficulties in mastering and using physics terminology, including in composing accurate scientific statements, emerged as the next obstacle. These findings show a strong correspondence between the initial assumptions of the study and the empirical patterns presented in the results and discussion sections. These results provide scope for developing more useful tutorial designs, including systematic language support and a more open instruction tempo to encourage communicative engagement among students. Further research could examine in greater depth the use of technology-based approaches, conduct comparative studies across disciplines, apply longitudinal methods to track the development of communication barriers over time, and formulate the most effective strategies to minimize these barriers in physics learning in English.

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