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RESEARCH ARTICLE

Virtual Reality as Exposure Therapy: A Qualitative Analysis on Reducing Communication Apprehension in Malaysian ESL Learners

Nik Amirul Afiq Nik Hassim[1*], Wan Nurul Elia Haslee Sharil[2], Muhamad Fariduddin Abdul Aziz[3]

[1]Faculty of Education, Universiti Technology MARA Selangor Branch Puncak Alam Campus Bandar Puncak Alam, 42300 Kuala Selangor, Selangor, Malaysia
Email: nikamirulafiq@uitm.edu.my
[2]Faculty of Education, Universiti Technology MARA Selangor Branch Puncak Alam Campus Bandar Puncak Alam, 42300 Kuala Selangor, Selangor, Malaysia
Email: nurulelia@uitm.edu.my
[3]Faculty of Education, Universiti Technology MARA Selangor Branch Puncak Alam Campus Bandar Puncak Alam, 42300 Kuala Selangor, Selangor, Malaysia
Email: fariduddin@uitm.edu.my

CORRESPONDING AUTHOR (*):
Nik Amirul Afiq Nik Hassim (nikamirulafiq@uitm.edu.my)

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ABSTRACT

Communication apprehension (CA) continues to impede oral language development among Malaysian ESL learners, particularly at the pre-university level, where high-stakes communication demands exacerbate existing anxieties. Recent developments in immersive technologies, notably Virtual Reality (VR), offer an alternative therapeutic approach by creating controlled exposure environments that may reduce apprehension through repeated, psychologically safe simulations. This qualitative investigation examined the potential of a Virtual Reality Immersive Module (VRIM) conceptualised as exposure therapy, drawing on semi-structured interviews with 15 learners and analysed using thematic procedures reinforced through member checking and peer debriefing to ensure trustworthiness. The findings revealed three interrelated themes—psychological safety afforded by immersion, strengthened self-confidence during communicative tasks, and heightened perceptions of authenticity in language use—that collectively illustrate how VRIM reshapes learners' affective responses and willingness to communicate. Participants consistently described reduced anxiety and increased communicative readiness, demonstrating that VR can function not merely as an engagement tool but as a pedagogically structured intervention targeting affective barriers. This study extends existing research by offering one of the earliest qualitative accounts of VR as exposure therapy within Malaysian ESL contexts, advancing theoretical discourse on technology-mediated affective support and highlighting VRIM's applicability in resource-constrained educational settings where traditional therapeutic or individualized scaffolding may be limited.

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Contribution/Originality: This study reconceptualises Virtual Reality Immersive Modules as a form of exposure-based pedagogy addressing communication apprehension among Malaysian pre-university ESL learners. Using qualitative thematic analysis, it reveals how immersive environments foster psychological safety, authenticity, and confidence, positioning VR as a viable, context-sensitive intervention that mitigates affective barriers in language learning.

1. Introduction

English proficiency continues to function as both an educational threshold and a professional prerequisite in multilingual societies. In Malaysia, the language occupies a particularly complex position officially recognized as a second language yet symbolically tied to social mobility and global competitiveness. National policies such as the Malaysia Education Blueprint 2015–2025 have reiterated the ambition to nurture bilingual citizens proficient in both Malay and English (Rashid et al., 2021). Still, despite decades of reform, a recurring problem remains: many students struggle to speak English confidently, particularly in formal or evaluative contexts. The difficulty is not purely linguistic. For many, the barrier lies in communication apprehension which is a type of anxiety that surfaces during or in anticipation of communication and is amplified by fear of making mistakes or being judged (Tan, 2021). Among Malaysian pre-university students, this anxiety is especially consequential, as it directly affects MUET performance and, by extension, university admission prospects.

Persistent weaknesses in oral proficiency reflect both structural and psychological constraints within Malaysian classrooms. Although communicative language teaching (CLT) has long been promoted, in practice, classroom discourse remains dominated by teacher talk, grammar exercises, and exam-oriented tasks. As Ahmad and Shah (2022) observe, such environments rarely provide the kind of low-risk, authentic interaction that language learners need to build confidence. In these circumstances, CA manifests not only as a momentary nervousness but as a sustained behavioral pattern—avoidance of speaking tasks, verbal hesitation, or even cognitive shutdown during oral assessments. Foundational works by Haron et al. (1986) already identified communication anxiety and fear of public speaking as core elements of foreign language anxiety, and these remain highly visible in Malaysian classrooms today. Beyond the classroom, limited communicative competence often extends into the workplace, contributing to employer complaints about graduates' weak soft skills and poor oral communication (Çelik & Memduhoğlu, 2022; Lee & Ogawa, 2021).

Across global ESL contexts, research increasingly recognizes that language learning is as much an affective and psychological process as it is cognitive. Anxiety, fear of negative evaluation, and self-consciousness all directly influence learners' willingness to communicate (Yang, 2022). Amalia (2020) found that students with higher CA prefer smaller, more supportive environments—a finding that seems particularly relevant for collectivist cultures like Malaysia, where "face" and social harmony can intensify the fear of public failure. While communicative language teaching has provided valuable principles, its local implementation has often been constrained by large class sizes and rigid syllabi (Muliyah & Aminatun, 2020). Consequently, there is an urgent need for interventions that not only teach language skills but also create affectively safe environments for communication practice.

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The advent of the Fourth Industrial Revolution (IR4.0) has opened such possibilities through immersive technologies. Under the 21st Century Teaching and Learning Strategies (21CTLS), tools like Virtual Reality (VR) have gained attention for their ability to recreate real-world communicative environments in psychologically safe, controlled settings (Rahman et al., 2021; Rofi'i et al., 2023). Unlike conventional speaking drills, VR allows learners to engage in simulated conversations, presentations, or discussions without the immediate social consequences of failure (Sunjayanto Masykuri & Basuki, 2022). This makes it an intriguing parallel to exposure therapy—a well-established psychological approach where gradual, repeated exposure to anxiety-inducing stimuli reduces fear responses over time. Applied to language learning, VR-mediated exposure could enable learners to confront and desensitize their fear of speaking in English, thus bridging pedagogical practice and psychological intervention (Rashid et al., 2021).

Yet, in Malaysia, this potential remains largely unexplored. Most local studies focus on technology adoption or teacher readiness rather than on affective outcomes (Muliyah & Aminatun, 2020). Moreover, pre-university learners—those under intense examination pressure—are often excluded from such investigations, even though they arguably face the highest communicative stakes (Xie et al., 2022). The present study responds to this gap by exploring how a Virtual Reality Intervention Module (VRIM) could serve both pedagogical and therapeutic purposes: enhancing oral proficiency while mitigating communication apprehension among Form Six students preparing for MUET. In Malaysia, where English is institutionalized as a second language, its importance is underscored in national policy documents such as the *Malaysia Education Blueprint (MEB) 2015–2025*, which aspires to produce bilingual citizens proficient in both Malay and English. Yet, despite decades of policy reform and the systematic integration of English instruction across all levels of schooling, a persistent gap remains in oral communication competence, particularly among upper-secondary and pre-university learners (Tan, 2021). The ability to speak fluently and confidently in English continues to be the most challenging component of language learning, often undermined by psychological factors such as anxiety, communication apprehension (CA), and fear of negative evaluation, as well as by structural constraints including limited vocabulary, weak pronunciation, and insufficient exposure to authentic communicative contexts (An et al., 2023; Li, 2020). These deficiencies are particularly critical for pre-university Form Six students who must undertake the Malaysian University English Test (MUET) speaking component which is a high-stakes assessment that directly influences university admission and future career trajectories.

Moreover, the persistence of low oral proficiency among Malaysian English learners reflects a broader pedagogical and psychological challenge within second language acquisition (SLA). Numerous scholars have argued that communicative competence cannot be effectively developed through grammar-based or teacher-centered approaches alone; rather, it requires sustained engagement in authentic, low-risk communicative situations that enable learners to internalize language use as a social and cognitive process (An et al., 2023). However, classroom realities in Malaysia continue to be dominated by exam-oriented instruction, limited student talk time, and insufficient opportunities for meaningful oral interaction (Ahmad & Shah, 2022). Within such contexts, CA a pervasive fear or anxiety linked to actual or anticipated communication with others (Ahmad & Shah, 2022) emerges as a debilitating psychological construct. Its manifestations include avoidance of participation, verbal hesitation, and performance breakdowns in oral tasks. Foundational studies by Muzanoradawani Mamat and Nur Salina Ismail (2025) identified oral communication anxiety and stage fright as core

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dimensions of foreign language anxiety, both of which remain salient in the Malaysian ESL context. Left unaddressed, CA not only impedes linguistic development but also shapes broader educational and professional outcomes, as limited communicative competence has been consistently associated with graduate unemployability and workplace communication deficiencies (Çelik & Memduhoğlu, 2022; Lee & Ogawa, 2021).

Globally, the intersection between language anxiety and learning outcomes has received growing empirical attention. Studies indicate that elevated CA significantly reduces learners' willingness to communicate, constrains collaborative engagement, and leads to negative self-perceptions of competence (Yang, 2022). Amalia (2020) further observed that students with high CA display preference for smaller, more personalized learning environments, suggesting that affectively supportive and psychologically safe settings are essential for oral skill development. These findings have catalyzed a reconceptualization of language pedagogy as one that must integrate cognitive, social, and affective dimensions of learning. While communicative language teaching (CLT) remains a dominant paradigm, its effectiveness is often curtailed by contextual limitations such as large class sizes, rigid curricula, and insufficient teacher training (Muliyah & Aminatun, 2020). Hence, there is an urgent pedagogical need for innovative interventions that simultaneously address linguistic and psychological barriers to speaking.

The emergence of the Fourth Industrial Revolution (IR 4.0) has created new pedagogical frontiers through digitalization, gamification, and immersive learning. Under the umbrella of 21st Century Teaching and Learning Strategies (21CTLS), technologies such as virtual reality (VR) have gained prominence for their capacity to simulate authentic environments, offering learners immersive, interactive, and controlled communicative experiences (Rahman et al., 2021; Rashid et al., 2021; Rofi'i et al., 2023). Unlike traditional classroom-based speaking activities, VR allows learners to practice English in realistic yet psychologically safe spaces such as virtual classrooms, meeting rooms, or public speaking venues without the social risks inherent in real-world communication (Sunjayanto Masykuri & Basuki, 2022). This technological affordance extends beyond linguistic enhancement; it has a therapeutic dimension aligned with the principles of *exposure therapy*, wherein individuals are systematically and safely exposed to anxiety-inducing stimuli until desensitization occurs. Within this framework, VR-mediated exposure therapy enables learners to confront their communicative fears in simulated scenarios, thereby reducing anxiety and building confidence over time (Rahman et al., 2021; Rofi'i et al., 2023). Empirical research supports this approach, showing that VR-enhanced language learning can reduce speaking anxiety, improve self-efficacy, and foster more positive attitudes toward oral communication (Rashid et al., 2021).

Despite these global advancements, the application of VR as a psychological intervention for communication apprehension in the Malaysian ESL context remains nascent and under-theorized. Existing studies primarily focus on general ICT integration, digital literacy, or teacher readiness in technology-enhanced classrooms (Amalia, 2020; Muliyah & Aminatun, 2020), without critically examining the affective potential of VR in mitigating CA. Furthermore, research on VR-based interventions tends to emphasize tertiary or general ESL populations, leaving pre-university learners—who face acute academic pressure, high-stakes assessment demands, and transitional anxieties—largely overlooked (Xie et al., 2022). This research gap is particularly consequential for Form Six students preparing for MUET, whose success in the speaking component is a key determinant of their access to higher education and subsequent employability. Therefore, this study seeks to explore how VR, when conceptualized through the theoretical lens of

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exposure therapy, can serve as both a pedagogical and psychological mechanism to reduce communication apprehension and enhance English speaking confidence among Malaysian ESL learners.

1.1. Research Objectives

The present study addresses these gaps through the design and evaluation of a Virtual Reality Intervention Module (VRIM). By integrating VR within the framework of 21st Century Teaching and Learning Strategies (21CTLS) and drawing upon exposure therapy as a theoretical underpinning, this study makes three key contributions:

i. It provides empirical evidence on the effectiveness of VRIM in reducing communication apprehension and speaking anxiety among Malaysian Form Six students.
ii. It captures learners' perceptions and experiences of VR-mediated speaking practice, thereby offering insights into learner-centered pedagogical design.
iii. It situates VR adoption within the Malaysian ESL policy landscape while contributing to international scholarship on technology-enhanced language learning, particularly in multilingual societies facing similar challenges.

Through these contributions, the study not only enriches the literature on SLA and educational technology but also delivers actionable implications for policymakers, educators, and curriculum designers seeking to foster communicative competence in contexts where English serves as a vital academic and professional gateway.

Addressing this gap, the present study introduces a Virtual Reality Intervention Module (VRIM) designed to reduce CA and speaking anxiety among Malaysian Form Six students. By situating VRIM within the dual framework of 21CTLS and exposure therapy, this research contributes to both pedagogical and psychological strands of SLA scholarship. It not only examines the effectiveness of VR in alleviating speaking anxiety but also foregrounds learners' perceptions of VR as a supportive tool in developing communicative competence. In doing so, the study provides evidence-based insights for policymakers, educators, and curriculum designers seeking to integrate emerging technologies into language instruction. Beyond the Malaysian context, the study's findings also hold broader implications for multilingual societies worldwide, where learners face comparable challenges in developing communicative competence under conditions of linguistic diversity and high academic expectations.

In sum, this research is motivated by three interrelated concerns: (1) the persistent problem of low English speaking proficiency and CA among Malaysian pre-university learners, (2) the underutilization of VR technology as a pedagogical and psychological intervention in local ESL contexts, and (3) the need to align language instruction with the demands of 21CTLS. By empirically investigating the role of VRIM in reducing CA and improving speaking skills, the study seeks to advance knowledge on technology-enhanced language learning while offering practical strategies to improve MUET outcomes and future employability of Malaysian graduates.

2. Literature Review

2.1. Virtual Reality as Exposure Therapy in Language Learning

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Exposure therapy, a mainstay of clinical psychology, rests on the idea that repeated, safe encounters with a feared stimulus can gradually reduce the associated anxiety (Schwab et al., 2022). Translating this principle into language learning, communication apprehension can be seen as a form of social anxiety including an unease triggered by the prospect of being evaluated during speech. From this standpoint, exposure therapy provides more than a metaphor; it offers a structured approach for addressing linguistic anxiety. Instead of treating CA as a purely academic problem, it reframes it as a psychological condition requiring gradual exposure and desensitization through communicative practice.

In ESL contexts, the therapeutic relevance becomes particularly salient because anxiety often arises not from linguistic weakness alone but from cultural and interpersonal pressures. Learners who constantly anticipate negative judgment internalize self-doubt that hampers fluency and spontaneity (Zhao, 2020). Studies have shown that simulated or staged communicative exposure whether in virtual or semi-authentic settings can meaningfully reduce anxiety levels. This convergence of therapeutic and pedagogical principles underlines the promise of integrating exposure-based design into language learning environments, where affective safety and repeated practice reinforce one another.

2.2. Virtual Reality as a Therapeutic-Pedagogical Medium

Virtual Reality operationalizes exposure therapy in a digital format. It allows learners to experience realistic communication settings, interviews, group discussions, and debates without the social risk inherent in real-world performance. In contrast to physical classrooms, where peer judgment may heighten anxiety, VR can provide private or semi-private practice spaces that foster self-paced learning and psychological safety**.** Such progression mirrors therapeutic exposure hierarchies: learners might begin with low-stakes tasks, such as introducing themselves to a small virtual audience, and gradually move toward complex, high-pressure situations. The sense of mastery achieved at each stage may, in turn, lower the affective filter and enhance linguistic self-efficacy.

Still, scholarly consensus on VR's pedagogical purpose remains unsettled. Some researchers emphasize its motivational novelty and gamified appeal (An et al., 2023), while others stress its affective benefits in anxiety reduction (Li, 2020). The divergence suggests a need for integrative frameworks that treat VR not as entertainment technology but as a bridge between pedagogy and psychology. Without theoretical grounding, VR risks being perceived as a short-lived trend rather than a sustained intervention.

2.3. Communication Apprehension in ESL Learners

Communication apprehension, originally conceptualized by Tan (2021), refers to the fear or anxiety associated with real or anticipated communication. In second language contexts, CA is magnified by the affective filter and by sociocultural expectations regarding correctness and self-presentation. Pan et al. (2021) expanded this concept through the Foreign Language Classroom Anxiety Scale (FLCAS), identifying CA as a key dimension of language anxiety encompassing fear of negative evaluation and performance pressure. Empirical research consistently reveals that learners with high CA avoid participation, exhibit reluctance during oral tasks, and underperform despite adequate linguistic ability (Sun & Li, 2020; Zhao, 2020).

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Cultural and social norms further mediate the manifestation of CA. In collectivist societies such as Malaysia, communication is closely tied to notions of social harmony and "face," making learners particularly sensitive to public failure (Amalia, 2020). Rahman et al. (2021) observed that Malaysian pre-university students often refrain from speaking in English not solely due to linguistic incompetence but from fear of peer judgment and loss of social credibility. These cultural dynamics suggest that Western communicative methodologies premised on individual assertiveness may not effectively mitigate CA in Asian contexts. Therefore, interventions must be both psychologically informed and culturally responsive, offering learners low-risk avenues for authentic communication.

2.4. Current Malaysian Pre-University Context: MUET, Anxiety, and Technology Integration

The current pre-university landscape in Malaysia foregrounds both the urgency and the complexity of addressing speaking anxiety among MUET-preparing learners: empirical investigations conducted in recent years report consistently high to moderate levels of speaking anxiety among Form Six and diploma cohorts, indicate that affective variables (fear of negative evaluation, shyness, low self-efficacy) are strongly associated with poorer speaking performance, and point to task-related factors (topic familiarity, preparation time, and assessment conditions) as recurrent triggers of anxiety in MUET-style tasks.

For example, a study of MUET-CEFR aligned oral presentations found that students experienced substantial speaking anxiety linked to insufficient scaffolding for oral tasks and inadequate preparation, prompting recommendations for teacher scaffolding and anxiety management in MUET instruction. Topic-familiarity research with Form Six MUET candidates further demonstrates that familiarity with speaking topics materially affects speaking performance and thus interacts with anxiety: less familiar topics increase cognitive load and heighten observable anxiety during high-stakes speaking tasks.

Regional investigations into Form Six populations corroborate these findings: recent research in Terengganu identified fear of negative evaluation, peer pressure, and linguistic gaps (vocabulary and grammar) as principal determinants of speaking anxiety among pre-university students, with measurable negative effects on oral performance. Broader descriptive analyses and institutional reports also highlight worrying achievement patterns that contextualize the affective problem for instance, analyses cited in recent local literature note considerable proportions of school MUET candidates scoring in lower MUET bands for speaking, a distribution that amplifies the stakes and social pressure surrounding oral performance.

Finally, although much Malaysian research has documented these affective and performance issues, the literature reveals a scarcity of studies that examine *technology-mediated* affective interventions (particularly qualitative investigations of learners' emotional trajectories within immersive environments), thereby leaving open a clear empirical and pedagogical gap for interventions that combine controlled exposure, scaffolded task design, and immersive practice precisely the niche that a VR exposure-therapy approach (VRIM) is designed to address. Table 1 shows the summary of current Malaysian Pre-University context of MUET, Anxiety and Technology Integration.

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Table 1: Summary of current Malaysian Pre-University context of MUET, Anxiety and Technology Integration

Author(s), Year	Sample / Population	Measure(s) / Focus	Key Findings / Statistics
Zulkflee, Marimuthu & Mohd Haniff (2023)	130 participants (Diploma and Form Six students)	Used PRPSA (Personal Report of Public Speaking Anxiety) and OCSI (Oral Communication Strategy Inventory) to measure speaking anxiety and strategy use during oral presentations under MUET-CEFR aligned format.	Found that participants report moderately high to high anxiety levels on PRPSA. (sciedupress.com) Also found statistically significant differences in strategy usage (e.g. message reduction/alteration, social-affective, negotiation for meaning etc.) between Diploma vs Form Six students.
Muzanoradawani Mamat & Nur Salina Ismail (2025)	226 Form Six students from three schools in Besut, Terengganu	Measured speaking anxiety levels and identified related factors (fear of negative evaluation, etc.), via online questionnaire with descriptive statistics.	Found moderate level of speaking anxiety among these students, with fear of negative evaluation being the most prominent determinant.
Bukhari, Ismail, Abu Kassim, Razali, Noordin & Noh (2023)	40 Form Six students preparing for MUET	Compared speaking performance across two speaking practice tests using retired MUET-CEFR speaking tasks; measured with criteria: task fulfillment, language, communicative ability, group discussion; also measured topic familiarity via self-report.	Results (via Many-Facet Rasch Measurement) showed that topic familiarity had a statistically significant effect on speaking performance: higher familiarity for better scores.

2.5. Immersive Technologies in Language Pedagogy

Immersive technologies, including Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR), signify a transformative change in language education, allowing learners to engage with simulated environments that replicate authentic communication contexts (Lei, 2020). Shu (2020) define immersive learning as a pedagogical approach leveraging multisensory digital environments to replicate authentic social contexts. By fostering experiential engagement, VR enhances motivation, situational awareness, and willingness to communicate (Sunjayanto Masykuri & Basuki, 2022). Huang and Teo (2021) further found that VR immersion improves pragmatic competence by allowing learners to interact with culturally embedded scenarios demanding spontaneous, contextually appropriate responses.

However, VR's transformative potential remains constrained by practical and conceptual limitations. Cost, accessibility, and technical literacy pose significant barriers in

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developing nations (Lei, 2020). More critically, many VR applications lack a coherent pedagogical or affective framework, reducing their impact to surface-level engagement (Pardede, 2020). Studies frequently report increased willingness to communicate without examining whether such effects translate into long-term anxiety reduction. This limitation underscores the need to reposition VR not merely as a motivational stimulus but as a systematic tool for emotional regulation and desensitization a perspective consistent with exposure therapy.

2.6. Bridging Psychological and Pedagogical Perspectives

The intersection of exposure therapy and immersive pedagogy presents an underexplored but theoretically rich domain. Psychology and language education have traditionally evolved as separate disciplines: the former concerned with anxiety management, and the latter with communicative competence. VR's dual affordance as both an immersive pedagogical platform and a therapeutic medium offers a means to bridge this divide. Existing CA-reduction strategies, such as role-playing or peer collaboration, presuppose learners' willingness to participate and therefore fail to address the deep-seated avoidance behaviors characteristic of high-CA individuals (Shu, 2020; Sunjayanto Masykuri & Basuki, 2022) VR circumvents these constraints by simulating communicative stressors in a controlled, private, and repeatable format, enabling systematic desensitization through virtual exposure.

Despite its potential, VR research often remains divided between psychological efficacy and pedagogical practicality. On one hand, exposure therapy studies confirm VR's effectiveness in reducing anxiety; on the other, language education research emphasizes engagement but rarely examines affective change. This disciplinary fragmentation limits understanding of how VR can holistically address CA. Consequently, three critical gaps persist: (1) limited application of VR as exposure therapy in ESL contexts, particularly within Southeast Asia; (2) insufficient qualitative insight into learners' emotional experiences during VR-based speaking tasks; and (3) a lack of theoretical integration between pedagogical and therapeutic frameworks.

2.7. Conceptual Framework: The Virtual Reality Intervention Module (VRIM)

To address these gaps, this study proposes the *Virtual Reality Intervention Module (VRIM)* an integrative framework grounded in exposure therapy and immersive pedagogy. Situated within the broader paradigm of 21st Century Teaching and Learning Strategies (21CTLS), VRIM operationalizes exposure therapy principles—gradual exposure, desensitization, and controlled repetition—within communicative language learning. It positions speaking anxiety not as an incidental affective variable but as a central barrier to linguistic and personal development. By merging psychological and pedagogical design, VRIM reframes VR from a motivational supplement into a core therapeutic-pedagogical intervention. Through this conceptual synthesis, the study contributes to a deeper understanding of how VR can transform ESL instruction into a psychologically informed, anxiety-reducing, and empowering experience for learners.

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3. Research Methods

3.1. Research Design and Justification

This study adopted an explanatory sequential mixed-methods design, in which the qualitative phase followed the quantitative intervention to provide in-depth explanations for the changes in communication apprehension (CA) observed during the earlier stage. This design is theoretically aligned with Creswell and Plano Clark's (2018) rationale that qualitative follow-up is essential when researchers aim to interpret psychological and behavioural patterns that numerical results alone cannot fully explain. In the context of this study, VR exposure is expected to influence affective variables such as anxiety, willingness to communicate, and perceived communicative competence—constructs that require interpretive insight beyond statistical outcomes. Thus, the mixed-methods structure enables the study to integrate evidence regarding whether VR reduces CA with deeper qualitative accounts explaining how, why, and under what conditions these changes occur.

3.2. Research Location and Contextual Justification

The study was conducted at a public secondary school (School X) located in Kelantan, Malaysia. This setting was strategically selected due to its sociolinguistic profile: Kelantan is widely documented as having one of the lowest levels of English usage in daily communication, both among school populations and within the broader community. Haron et al. (2019) note that Kelantanese learners often have limited exposure to authentic English interactions, leading to heightened anxiety when required to communicate orally. This contextual reality strengthens the relevance of the research site, as it allows for a rigorous assessment of whether Virtual Reality Immersive Modules (VRIM) can reduce CA among students who experience genuine linguistic and psychological barriers to English communication.

3.3. Population

The population for this study comprised Form Six students enrolled in the Malaysian Higher School Certificate (MUET) programme at School X. Only programme participants were included, as the core aim was to examine the experiences of learners directly engaged in VR-supported communication tasks. Stakeholders such as teachers, administrators, and parents were not included in the population frame, as the study's analytical emphasis lies in understanding students' affective responses, behavioural adjustments, and experiential perceptions following the VRIM intervention.

3.4. Sample Size and Justification

A total of 12 participants were recruited for the qualitative phase. This number is methodologically justified using qualitative sampling principles rather than power calculations, consistent with the interpretive orientation of the study. Guest, Bunce, and Johnson's empirical work demonstrates that thematic saturation in homogeneous groups typically occurs within 6–12 interviews, and Creswell and Plano Clark's (2018) similarly emphasise that qualitative phases within mixed-methods designs intentionally rely on small samples because their purpose is depth of explanation rather than statistical generalisation. All 12 participants shared key characteristics—they were from the same school environment, underwent identical MUET preparation, and completed the same

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VRIM sessions—which, as Morse argues, makes smaller samples analytically strong due to coherence and internal consistency. Thus, the sample size is both theoretically sound and practically feasible within the constraints of school-based research involving limited VR equipment and structured academic timetables.

3.5. Sampling Technique

Purposive sampling was employed to ensure that only students who had completed all VRIM exposure sessions were included. This technique is widely recommended for studies examining experiential and affective phenomena, as it allows researchers to select participants who can provide rich, meaningful insights based on first-hand involvement in the intervention. Additionally, purposive sampling ensured that all participants could articulate emotional, psychological, and behavioural changes resulting from the VR-based exposure process.

3.6. Data Collection Procedures

Data were collected through semi-structured, face-to-face interviews conducted with the 12 student participants and one proxy teacher to triangulate pedagogical perspectives. Semi-structured interviews were selected to provide flexibility for probing emergent ideas while maintaining consistency across interviews. The face-to-face format was particularly important given the study's focus on affective constructs, as it allowed the researcher to observe non-verbal cues—such as hesitation, changes in tone, and body language—which often reflect underlying anxiety and confidence shifts. All interviews were audio-recorded with informed consent to ensure accuracy in transcription and analysis, supported by field notes documenting contextual observations. The interview protocol was pilot-tested with two non-participating students to refine question clarity, flow, and suitability for eliciting deep reflections on VRIM experiences. The interviews focused on students' perceptions of psychological safety, authenticity, and self-confidence when performing communicative tasks in VR environments.

As for the qualitative instrument, the researcher will employ face-to-face interview to gather qualitative data from the participants, in terms of their personal experience and views regarding the overall effectiveness of the VRIM to alleviate Form Six Students' CA levels. A total of 12 participants of mixed genders from the experimental group and one porxy teacher will be interviewed following the qualitative data collection. According to Creswell and Creswell (2018), there is no specific number of participants that a qualitative research should have, however, "case studies include about four to five cases.". Therefore, since the qualitative data is conducted only in one school, it should satisfy the criteria of the case study design and therefore, the number of selected participants is adequate for the purpose of qualitative data collection. Below in Table 2 is an example of open-ended questions that the researcher would ask to answer Research Question.

Table 2: Section of the Interview

Research Question	Questions
How effective is the Virtual Reality Intervention Module (VRIM) in alleviating participants' CA from	1. Do you believe VRIM has the potential to alleviate your communication anxiety? Kindly explain your response. 2. In your perspective, how may VRIM's effectiveness be enhanced further to alleviate students' communication apprehension? Kindly explain your response.

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the perspective of Form Six Students?	3. Do you think that VRIM has the potential to develop your speaking skills? Kindly explain your response. 4. Which part of VRIM that you benefit the most (i.e speaking practice, feedback, virtual environment)? Kindly explain your response.

Note: Three Interview Questions for Research Question 5

3.7. The VR Application

This study endeavour employed Immerse, a virtual reality application specifically developed for real-time language instruction and acquisition. Immerse operates as a virtual learning platform where students participate in teacher-led, interactive, task-oriented, or problem-based activities within contextually pertinent virtual environments to acquire, practise, or enhance the target language as per suggested by (Pan et al., 2021). The application provides both a desktop version and a head-mounted display (HMD) version. Students utilised VR sessions via their desktop browsers, whereas the instructor operated the Immerse teacher interface on a desktop computer. The teacher interface featured tools designed to assist with class management and facilitation, including a Rally function to bring all students together in one place and the integration of whiteboards, scoreboards, labels, images, YouTube videos, and slides into the virtual environment. The teacher could also form teams, control the audio, send pop-up chat messages, and use a Planning Hub to save lesson plans and activate customizable scene elements like graphic organizers and prompt cards (Pan et al., 2021). The Immerse learning environment and its tools are illustrated in Figure 1.

Figure 1: AR software

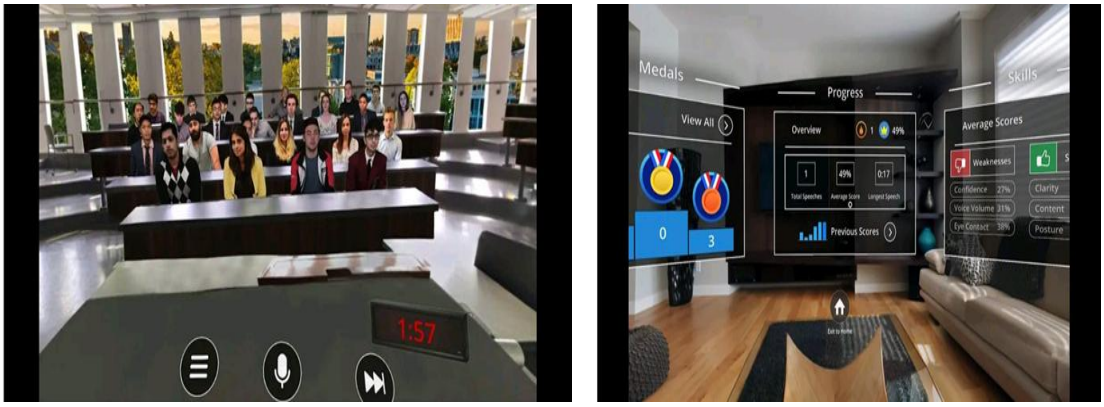

Figure 1 illustrates the virtual reality software employed in this investigation. This program is developed by the Faculty of Education at UITM Shah specifically for the English VR subject. The VR software depicted in Figure 1 served as the primary technological tool employed to implement the exposure-therapy-informed intervention in this study. The left panel illustrates a simulated lecture hall filled with a virtual audience, intended to replicate high-pressure communication situations that often induce anxiety in ESL learners; this setting allowed participants to practise oral tasks while progressively adapting to audience presence, eye contact, and time limitations, which are key factors contributing to communication apprehension. The right panel exhibits the analytic dashboard integrated into the VR system, offering real-time performance metrics including vocal clarity, pace, gesture frequency, and engagement indicators. This immersive setting enabled learners to practise oral performances frequently, acclimatise to audience presence, and face anxiety-provoking stimuli such as eye contact, spatial

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dynamics, and time limitations—in a progressive and self-directed way aligned with exposure-based methodologies. The software's integrated analytic dashboard supplemented this simulation by offering real-time feedback on vocal delivery, pacing, gesture utilisation, and overall performance, allowing users to track their progress and critically evaluate their communicative habits. The VR sessions established the experience basis for following semi-structured interviews, during which 15 participants articulated their emotional responses, perceived enhancements, and difficulties encountered when utilising VRIM. The data were evaluated thematically through an iterative coding process, supplemented by member checking and peer debriefing to ensure reliability and trustworthiness. A lesson plan for each session outlining the basic flow of VRIM treatment was also executed, as detailed in Table 3.

Table 3: Lesson Plan Constructs for VRIM Sessions

Construct	Descriptions
Objective	By the end of this lesson, students should be able to: 1. Operate VR technology for speaking practice within a 20-minute time frame. 2. Capable of delivering an individual speech on the topic they practiced using VR technology with minimal faults (grammar, fillers, and appropriate body language).
Pre-Lesson	1. Teacher X provides students with an overview of the lesson's objectives. 2. Teacher X instructs students to prepare for speaking practice using VR technology (headgear and application). 3. Teacher X demonstrates to the students about using VR technology for speaking practice .
Lesson Delivery	1. Teacher X engages as a facilitator, facilitating students' learning with minimal interference in order to foster behaviour change and give students the opportunity to construct their own knowledge. 2. If necessary, Teacher X provides technical assistance. 3. Students will practice speaking utilising VR technology twice, for a total of ten minutes per session, with a five-minute break following the first session. This is to ensure that the students' health is not jeopardised.
Post Lesson	1. Teacher X will invite two students to present an impromptu speech on a topic identical to the one they practice d during the lesson delivery. 2. Teacher X provides the necessary corrective feedback to students in order to help them improve their speaking skills for future use.
Teaching Aids	VR technology (headgear and application, and smartphones.
Reflection	Teacher X will summarise the VRIM session in terms of student development, unforeseen challenges that arise during the session, and students' overall attitude toward the lesson.

Note: Objective Construct, Pre-Lesson Construct, Lesson Delivery Construct, Post-Lesson Constrct, Teaching Aids Construct, and Refelection Construct

3.8. Data analysis

The qualitative data in this study were analyzed using thematic analysis, following the systematic procedures outlined by Creswell and Creswell (2017), and interpret patterns of meaning within participants' narratives, thereby capturing the depth and diversity of

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their perceptions toward the Virtual Reality Intervention Module (VRIM) in mitigating communication apprehension (CA) and speaking anxiety (SA).

Six semi-structured interviews with Form Six participants were audio-recorded and transcribed verbatim to ensure data accuracy. The transcriptions were imported into ATLAS.ti (Version 9) software, which facilitated the coding, categorization, and visualization of emerging patterns. The analysis followed Braun and Clarke's (2006) six-step framework: (1) Acquaintance with the data via multiple readings of transcripts; (2) generating preliminary codes to encapsulate significant information units; (3) identifying themes by grouping analogous codes; (4) evaluating and refining themes for coherence and internal consistency; (5) delineating and labelling themes to guarantee conceptual clarity; and (6) composing the final analytical report.

During the coding process, inductive and deductive strategies were applied to ensure both data-driven insights and theoretical alignment with exposure therapy and affective learning constructs. Initial codes such as *"reduced fear when using VR," "feeling safe to speak,"* and *"increased confidence through repetition"* were identified and later consolidated into broader thematic categories. The preliminary coding was conducted independently by two researchers and cross-validated to enhance analytical rigor. Any discrepancies were resolved through reflective discussion until consensus was achieved. The study adhered to the criteria of qualitative rigor which are credibility, transferability, dependability, and confirmability (Zhao, 2020). Credibility was established through triangulation of interview data and member checking, where participants reviewed summarized interpretations of their responses for accuracy. Transferability was achieved through detailed contextual descriptions of the participants, setting, and research process to allow replication in similar ESL environments. Dependability and confirmability were maintained by keeping an audit trail documenting coding decisions, thematic development, and researcher reflections throughout the analysis process.

From this analytical process, five major themes were generated to capture the multidimensional experiences of Form Six students in using VRIM to mitigate communication apprehension (CA) and speaking anxiety (SA). These were:

i. Engagement Challenges in VRIM – Participants revealed difficulty sustaining engagement within the virtual platform due to limited social interaction, repetitive content, and lack of peer presence. The immersive intent of VRIM was undermined by the static and isolating design, which failed to replicate the spontaneity and communicative vibrancy of traditional classroom exchanges.
ii. Confidence Building Through VRIM – VRIM was perceived as a psychologically safe space that allowed anxious or introverted learners to practise oral communication without social pressure. However, this confidence was often situational, with participants expressing uncertainty about transferring their virtual confidence to real-world contexts, highlighting the need for scaffolding between virtual and authentic environments.
iii. Physical and Emotional Discomfort with VRIM – Despite its innovative features, VRIM was associated with physical strain (e.g., eye fatigue, facial pressure) and emotional detachment. The ergonomic limitations of VR headsets and the lack of realistic avatars created discomfort, which negatively influenced immersion and sustained use.
iv. Frustration with Lack of Feedback – Participants consistently voiced dissatisfaction with the absence of real-time corrective feedback. While VRIM facilitated repetitive

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self-practice, it failed to provide the pedagogical immediacy and responsive correction typical of face-to-face learning. This limitation was perceived as impeding both confidence and communicative competence development.

v. Preference for Face-to-Face Interaction – Although VRIM provided a controlled and anxiety-reducing environment, participants overwhelmingly preferred face-to-face communication for its immediacy, non-verbal cues, and interactive spontaneity. They regarded VRIM as a supplementary tool rather than a substitute for authentic interpersonal engagement.

Together, these themes illustrate the duality of technological immersion and human connectedness in virtual learning. The analysis underscores that while VRIM offers potential benefits for affective and confidence development, its current design inadequately addresses social, ergonomic, and feedback-driven needs essential for sustained communicative competence. Future iterations should integrate peer collaboration, AI-based feedback, and ergonomic redesign to enhance both emotional engagement and learning transferability.

Ethical approval for this work was secured from the appropriate institutional review board of the researcher's university. All participants granted informed consent before engaging and were guaranteed confidentiality as well as the freedom to withdraw at any point without repercussions.

4. Results

4.1. Participants

A total of 12 students (5 males and 7 females) aged 18 to 20 years participated in the VRIM. The data fell under two overarching themes: 1) students' VP user experience and 2) clinical facilitators' evaluations of students' clinical communication skills. Six themes were generated, including one overlapping theme. Representative quotes for each subtheme are presented in Table 4.

Table 4: Demographic Profile for Qualitative Participants

Participant	Gender	Previous School	SPM English Grade	Duration of Study	Study Stream
1	Male	Maahad Muhammadi Rantau Panjang	D	2 years	Arabic
2	Female	SMK Baroh Pial	D	1 year	Science
3	Male	SMK Gual Periuk	B	1 year	Art
4	Male	SMK Gual Periuk	D	2 years	Art
5	Female	SMK Rantau Panjang	B	2 years	Economics
6	Female	SMK Gual Periuk	D	2 years	Science
7	Male	SMK Rantau Panjang	D	1 year 6 months	Art
8	Male	SMK Rantau Panjang	D	2 years	Science
9	Female	SMK Gual Periuk	C	2 years	Science
10	Female	SMK Baroh Pial	C+	2 years	Art

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11	Female	SMK Rantau Panjang	D	1 year 2 months	Science
12	Female	SMA Al-Falah Siram	D	1 year	Religious Stream

4.2. Major Findings: Theme 1 – Disengagement and Cognitive Isolation in VRIM

The first emergent theme, *Disengagement and Cognitive Isolation in VRIM*, captures the participants' mixed attitudes toward the Virtual Reality Interactive Module (VRIM) as a learning environment. Although VRIM was intended to offer an immersive and interactive mode of English communication training, many participants reported a notable gap between its technological promise and their actual experience. The data reveal that the module often failed to sustain meaningful engagement, primarily due to its lack of social presence, repetitive structure, and limited interaction. Engagement conceptualised as the learner's mental, emotional, and behavioural investment in learning activities—appeared compromised when learners operated in an isolated virtual space devoid of peer collaboration or immediate feedback. Participant 1 articulated this sentiment clearly: *"For me, when I study alone, like using VR, this object, that's too boring to me."* This view exemplifies how the absence of interpersonal exchange contributed to emotional disengagement, highlighting that motivation in language learning extends beyond technological novelty to encompass relational and contextual dimensions.

Participants recurrently contrasted VRIM with face-to-face classroom interactions, citing the lack of communicative spontaneity and feedback as major deterrents. As Participant 3 noted, *"It's not the same as talking to real people because in VRIM, we can't have a real response."* Such statements emphasise that authentic communication, which relies on immediacy, reciprocity, and non-verbal cues, cannot be fully replicated in a programmed virtual interface. Furthermore, several participants associated this isolation with diminished motivation. Participant 1 reiterated, *"I really like the vibe in the class. For me, when I study alone, it feels less motivating."* The term "vibe" metaphorically reflects the affective energy of collective learning—an essential but missing component in the VRIM environment. Similarly, Participant 2 linked disengagement to both physical and emotional fatigue: *"We got many side effects like our eyes got tired… and maybe our brain getting more bored."* This statement reflects not only ergonomic issues but also cognitive strain resulting from repetitive, non-social interaction.

Nevertheless, the findings also reveal students' awareness of VRIM's potential value, provided that it integrates peer-based features or classroom reinforcement. Participant 6 observed, *"We need to talk with our own friends in VRIM… some people feel shy to talk with people around,"* implying that VRIM could serve as a confidence-building platform if redesigned for collaborative use. Participant 12 similarly suggested, *"Maybe use this VRIM in a classroom… many times,"* indicating a desire for blended implementation where virtual tools complement rather than replace face-to-face engagement. Collectively, these reflections underscore a crucial insight: while VRIM offers technological innovation, its current configuration does not sufficiently accommodate the inherently social and interactive nature of language learning. Thematic synthesis therefore suggests that engagement in virtual learning environments is not solely contingent on interactivity but deeply influenced by learners' affective connection, peer presence, and contextual relevance.

Taken together, these statements demonstrate that the immersive promise of VRIM is undermined by its inability to simulate the spontaneity, feedback, and social nuances

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inherent in real-world communication. VRIM may benefit learners comfortable with independent, structured practice but may fall short for those requiring interpersonal interaction to sustain engagement. The mixed perspectives indicate that VRIM's effectiveness is conditional upon individual preferences and the degree to which the platform supports authentic, dynamic communication.

4.3. Major Findings: Theme 2 – Confidence Building Through VRIM

Theme 2 analysis reveals a nuanced interplay between virtual engagement and affective development, particularly in relation to communication confidence among participants. Drawing upon verbatim responses, VRIM was recognised for fostering a safe environment conducive to practising oral skills yet concerns arose regarding real-world applicability. This duality of empowerment and scepticism forms the core argument.

The second emergent theme, *Confidence Building and Affective Empowerment Through VRIM*, highlights how virtual environments facilitated participants' self-assurance in English oral communication by reducing social pressure and providing a psychologically safe practice space. Qualitative evidence illustrates that VRIM functioned as an affective scaffold offering participants an environment where fear of judgment was mitigated, and communicative experimentation became possible. This aligns with Krashen's (1982) affective filter hypothesis, which posits that lower anxiety enhances language acquisition and output. Participants repeatedly associated VRIM with comfort, safety, and self-expression, suggesting that the virtual space supported gradual confidence formation. Participant 3 articulated this clearly: *"For me, I am an introvert person, I prefer VRIM because it can push my self-esteem."* This view captures VRIM's capacity to provide psychological distance from real-world scrutiny, enabling participants particularly those with introverted dispositions to practise speaking without fear of embarrassment or social evaluation.

Participant 5 reinforced this sentiment by asserting, *"I don't need to meet someone or go out to speak with someone. I feel more comfortable."* The emphasis on "comfort" reflects reduced affective barriers and greater autonomy in managing one's communicative exposure. The notion of psychological comfort in VR-based learning resonates with prior studies that describe virtual environments as "safe rehearsal zones," where learners can engage in repeated oral practice without immediate external pressure (Kaplan-Rakowski & Wojdynski, 2018). These findings collectively indicate that VRIM's controlled, low-stakes setting enables students to focus on linguistic performance rather than social consequences, thereby facilitating affective empowerment.

However, participants also acknowledged the limits of such confidence when transitioning from virtual to authentic communicative contexts. Participant 6 reflected critically, *"In VR, I can talk freely, but I don't know if I can do the same in a real classroom."* This statement reveals the fragility of confidence that is nurtured in simulated settings but not yet reinforced through real-world social validation. Similarly, Participant 8 noted, *"After I use VRIM, I become more confident… but I prefer face-to-face because I get feedback from my teacher."* The ellipsis in this quote signifies an ambivalence the coexistence of empowerment and scepticism regarding VRIM's transferability. This duality underscores the need for pedagogical scaffolding that bridges virtual confidence with authentic communicative application.

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Participant 11 expressed a more explicitly positive transformation: *"My communication skill improved… and my anxiety get lower."* This perception evidences a successful reduction of communication apprehension (CA), suggesting that VRIM fulfilled its therapeutic function as a form of controlled exposure to anxiety-inducing communicative tasks. Yet, as Participant 12 proposed, *"Maybe use this VRIM in a classroom… many times,"* repetition and contextual integration appear essential to sustain and stabilise such affective gains. The recommendation implies that confidence cultivated in VRIM is cumulative rather than instantaneous, requiring consistent exposure and gradual reinforcement through blended learning strategies.

Overall, this theme demonstrates that VRIM can act as a preliminary intervention tool to reduce CA and enhance communicative confidence, particularly for learners who fear negative evaluation. Nevertheless, the findings reveal that VRIM-induced confidence is conditionalit flourishes in simulated environments but risks attenuation when transposed to spontaneous, social settings. The results thus suggest that VRIM's optimal pedagogical value lies in its use as a supplementary "confidence incubator," not a substitute for interpersonal communication practice. Future implementations should incorporate mechanisms for feedback, peer interaction, and teacher mediation to ensure that affective gains translate into sustainable communicative competence.

4.4. Major Findings: Theme 3 – Physical and Emotional Discomfort in Virtual Engagement

The third emergent theme, *Physical and Emotional Discomfort in Virtual Engagement*, underscores the corporeal and psychological strain experienced by participants during prolonged interactions with the Virtual Reality Interactive Module (VRIM). While VRIM was envisioned as an immersive, technologically advanced platform, many participants reported discomfort that hindered their concentration, motivation, and overall affective engagement. These accounts reveal a paradox: the same immersive technology designed to enhance learning immersion can simultaneously induce physical fatigue and emotional detachment. Participant 1 noted, *"I don't like using VRIM because it gives me more pressure on my nose,"* drawing attention to the ergonomic limitations of the headset. Similarly, Participant 2 explained, *"We got many side effects, like our eyes got tired,"* which points to the physiological toll of extended VR exposure. Such discomforts, ranging from visual fatigue to facial pressure which contributed to reduced session length and diminished learning satisfaction.

Beyond physical strain, participants described emotional unease arising from the artificiality and spatial intensity of the VR environment. Participant 3 stated, *"It feels weird. The 3D people are too close, and it hurts my eyes."* This sense of "weirdness" encapsulates a deeper cognitive dissonance: the proximity of digital avatars mimics social interaction but lacks the authenticity and emotional cues of human presence. The result is a form of *pseudo-intimacy* that fails to provide the psychological comfort typically associated with genuine interpersonal exchange. Consequently, VRIM's immersive design, while visually engaging, appeared to compromise the user's emotional equilibrium and communicative naturalness.

Participants proposed practical and pedagogical refinements to mitigate these issues. Participant 6 suggested, *"VRIM should add more features to let us talk to our friends,"* emphasising that improved interactivity could alleviate the sense of isolation. Participant 10 added, *"It will be great if it came out with a smaller edition,"* implying that ergonomic

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redesign could enhance accessibility and reduce fatigue. These statements collectively indicate that the discomforts were not merely technological inconveniences but central to the learners' affective experience. The lack of ergonomic comfort, social realism, and emotional connection ultimately weakened the perceived authenticity of the learning process.

The data therefore reveal that user discomfort operates as both a *physical constraint* and an *emotional barrier* to engagement. The findings align with existing research that cautions against the overreliance on immersive technologies without adequate attention to user well-being and design ergonomics. From a pedagogical standpoint, these insights highlight that affective comfort is a prerequisite for sustained motivation in virtual learning environments. While VRIM may provide short-term novelty and engagement, its long-term viability depends on balancing sensory stimulation with cognitive and emotional ease. Until such equilibrium is achieved, VRIM remains better suited for brief, structured sessions rather than extended communication training.

4.5. Major Findings: Theme 4 – Frustration with Lack of Feedback

Building upon the physical and emotional challenges identified in the previous theme, participants' experiences also revealed a deeper layer of psychological tension linked to the perceived absence of feedback within the virtual learning environment. While Theme 3 highlighted how immersive technology occasionally generated sensory strain and affective unease, Theme 4 extends this understanding by uncovering the cognitive and motivational implications of interactional silence in VRIM. In essence, the discomfort experienced by participants was not confined to the physical dimension of virtual engagement but was compounded by the pedagogical void created when learners received little or no formative guidance after completing speaking tasks. This progression from bodily unease to feedback frustration illustrates a continuum of experiential challenges in the use of immersive technology for language learning wherein the lack of interpersonal validation, correction, or reinforcement further accentuates feelings of isolation and uncertainty. The juxtaposition of these two themes suggests that emotional well-being and pedagogical responsiveness are mutually reinforcing dimensions of successful VR-based language instruction.

A recurring concern among participants involved the perceived insufficiency of timely and constructive feedback during their engagement with the Virtual Reality Interactive Module (VRIM). While the system was designed to simulate authentic communicative contexts, participants expressed that the absence of real-time corrective input or personalized evaluation diminished their motivation to improve. Several participants noted that after completing the VR tasks, they were uncertain about their performance quality or specific linguistic weaknesses, with one participant commenting, *"I could speak in VR, but I didn't know if my pronunciation or grammar was correct — it just ended."* This lack of guided feedback reportedly generated feelings of frustration and confusion, especially among students accustomed to teacher-led feedback loops in traditional classroom settings.

From a pedagogical standpoint, the findings reveal a fundamental disjunction between the affordances of automated VR environments and the students' expectations for human-mediated assessment and scaffolding. For many participants, feedback is not merely evaluative but motivational, shaping their self-efficacy and perceived learning progress. The absence of such formative feedback in VR contexts, therefore, may hinder the

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consolidation of linguistic competence and confidence that the module aims to foster. These findings echo prior studies by Huang & Teo, (2020) **i**ndicating that while immersive technologies enhance engagement and exposure, their effectiveness in language learning is contingent upon the inclusion of responsive feedback mechanisms that guide learners' reflective practice.

Moreover, the psychological dimension of feedback deprivation became evident as participants articulated feelings of isolation and self-doubt. The immersive nature of VR paradoxically intensified this emotional gap: the more realistic the environment appeared, the more participants expected real interpersonal response. One participant observed, *"It felt real, but no one was there to tell me how I did, it's like talking to a wall."* This statement captures the inherent tension between technological realism and pedagogical interactivity. Without adequate feedback, VRIM risks becoming a one-way communicative simulation rather than a reciprocal learning experience.

The theme underscores the crucial role of human feedback as both a cognitive and affective support mechanism in virtual language learning environments. It suggests that the integration of automated speech analysis tools, teacher-mediated review sessions, or peer-feedback components could significantly enhance learners' perception of value and direction in the VRIM experience. Thus, while the VRIM effectively immerses students in simulated speaking tasks, its pedagogical impact depends on embedding structured feedback channels that transform individual immersion into meaningful language development and sustained learner motivation.

4.6. Major Findings: Theme 5 – Preference for Face-to-Face Interaction

Despite the intended immersive and autonomous nature of the Virtual Reality Interactive Module (VRIM), a dominant theme emerging from the data was the participants' persistent preference for traditional face-to-face interaction. This preference reflects not merely a habitual reliance on conventional learning but rather a deeper recognition of the pedagogical and socio-emotional value embedded in direct human communication. Participants consistently articulated that VRIM, while innovative, lacked the immediacy, reciprocity, and authenticity inherent in physical classroom interactions. Participant 7, for instance, observed, *"In face-to-face communication, I get feedback from my teacher immediately,"* emphasizing that the immediacy of corrective feedback in traditional settings is crucial for language refinement and confidence building. This notion underscores a fundamental pedagogical gap in VRIM's current design the absence of synchronous feedback mechanisms that support the iterative process of learning.

Furthermore, the participants highlighted the loss of non-verbal cues, which are essential components of communicative competence. Participant 10 stated, *"When we speak face-to-face, we can see expressions and body language, which helps us communicate better."* This reflection aligns with Goffman's interaction theory (Collins (1980), suggesting that meaning-making extends beyond verbal exchange to include gestures, facial expressions, and tone, all of which were notably absent in the VRIM environment. Without these cues, participants perceived communication as mechanistic and emotionally detached, weakening their sense of connection and conversational flow. Participant 5 added, *"Speaking face-to-face helps me build confidence because I can see how people react,"* reaffirming that affective reinforcement through eye contact, nodding, or smiles plays a vital role in sustaining learner motivation and validating self-expression.

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While VRIM offers a less intimidating environment for learners with high communication apprehension, it was evident that many participants equated the absence of real human interaction with diminished authenticity and engagement. Participant 3 remarked, *"It's not the same as talking to real people because in VRIM, we can't have a real response,"* encapsulating the sentiment that virtual interactions lacked the spontaneity and emotional resonance of real communication. The technology, despite its potential, was thus perceived as a supplementary tool rather than a replacement for interpersonal exchange. To mitigate this, several participants recommended incorporating social or collaborative elements into the VRIM design. Participant 6 suggested, *"VRIM can be improved by adding a feature to talk with friends,"* demonstrating a desire for peer collaboration that mirrors the relational dynamics of real classrooms.

Interestingly, some participants acknowledged the tension between the benefits of VRIM's privacy and the drawbacks of its isolation. Participant 11 shared, *"Students no need to be in a crowded place because it can make them nervous… but talking with someone helps improve communication skill."* This statement illustrates the paradoxical balance between psychological comfort and communicative authenticity. While virtual environments reduce anxiety, they also risk creating social detachment that limits real-world transferability of communicative competence.

In summary, the findings from this theme reveal that while VRIM provides a safe, individualised platform for practising communication, it falls short in replicating the richness of face-to-face interaction, where learning occurs through multidimensional feedback loops, emotional attunement, and authentic social presence. The persistent preference for traditional interaction suggests that human connection remains central to language learning and confidence development. Therefore, VRIM's pedagogical value lies not in replacing but in complementing in-person engagement. Integrating hybrid features such as live feedback, peer dialogue, or synchronous interaction could bridge the experiential gap and enhance both the affective and cognitive outcomes of virtual training.

4.7. Summary of Thematic Findings

The thematic analysis of participants' responses yielded five interrelated themes that collectively reveal a complex relationship between affective, cognitive, and technological dimensions of virtual learning through the Virtual Reality Interactive Module (VRIM). Taken together, these themes, (1) *Engagement Challenges in VRIM*, (2) *Confidence Building through VRIM*, (3) *Physical and Emotional Discomfort in Virtual Engagement*, (4) *Frustration with Lack of Feedback*, and (5) *Preference for Face-to-Face Interaction* demonstrate that while VRIM offers promising potential for communicative practice and anxiety reduction, its effectiveness is constrained by technological limitations, design shortcomings, and the absence of real-time interpersonal engagement.

The first theme revealed that although VRIM was designed to foster immersion, many participants experienced emotional detachment and motivational decline due to its isolating nature. Engagement in language learning, as highlighted by participants, depends not only on visual interactivity but also on the social energy and communicative spontaneity generated through human interaction. The second theme, however, presented a counterbalancing insight, illustrating how VRIM provided a psychologically safe environment that allowed introverted or anxious learners to practise oral communication with reduced fear of judgment. This paradox between increased self-confidence and

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reduced social stimulation captures the duality of technology-mediated learning: empowerment through autonomy yet disengagement through isolation.

Themes three and four deepened this analysis by identifying the embodied and cognitive consequences of VR-based learning. The physical discomfort caused by prolonged headset use and visual fatigue undermined the intended immersive benefits, while the emotional fatigue from the lack of authentic interaction further reduced learner satisfaction. Equally significant was the participants' frustration with VRIM's absence of real-time feedback, which they associated with stagnation in learning progress. This finding underscores the pedagogical necessity of feedback as both a corrective and motivational mechanism. Without immediate guidance, learners found it difficult to self-assess their communicative performance, leading to diminished confidence and retention.

The fifth theme illuminated a persistent preference for face-to-face interaction, which participants regarded as superior for meaningful communication and skill transfer. Non-verbal cues, instant teacher responses, and authentic social exchanges were perceived as irreplaceable in facilitating deeper understanding and emotional connection. While participants acknowledged VRIM's potential to supplement learning, especially for self-paced practice or anxiety management they consistently rejected the notion of it being a pedagogical substitute for real-world communication.

Overall, the five themes reveal a nuanced portrait of virtual language learning that transcends binary evaluations of "effective" or "ineffective." Instead, the findings suggest that VRIM's pedagogical success depends on its integration within a hybrid learning model that balances technological autonomy with human mentorship and social interaction. In alignment with Krashen's Affective Filter Hypothesis**,** VRIM demonstrates potential in lowering learners' anxiety and supporting initial confidence-building; however, sustained language proficiency development requires interactive validation and feedback loops grounded in authentic communicative contexts. Future iterations of VRIM should therefore prioritise ergonomic design improvements, embedded feedback systems, and collaborative functions that simulate classroom dynamics. Such enhancements would transform VRIM from a static simulation tool into a dynamic platform capable of promoting genuine engagement, confidence, and communicative competence among MUET learners.

5. Discussion

In the Malaysian pre-university context, particularly within the Malaysian University English Test (MUET) framework, there has been a consistent emphasis on enhancing students' communicative competence to meet university-level academic and professional demands. However, despite policy efforts under the Common European Framework of Reference (CEFR) alignment and the Malaysia Education Blueprint (2013–2025), many pre-university students continue to face significant challenges in oral communication, including anxiety, low confidence, and limited exposure to authentic speaking contexts. Recent studies, has highlighted that even after years of formal instruction, MUET candidates often underperform in the Speaking component, largely due to affective barriers and lack of real-life communicative practice. The integration of digital and immersive technologies, such as Virtual Reality Interactive Modules (VRIM), represents a progressive response to these pedagogical challenges, aiming to simulate authentic communication environments while providing a controlled and anxiety-reduced space for language learning. Therefore, the discussion that follows situates the findings of this study

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within this broader Malaysian educational landscape, critically examining how VRIM may support or constrain MUET learners' communicative confidence, engagement, and performance in relation to current educational goals.

5.1. Theme 1: Disengagement and Cognitive Isolation in VRIM

The first major theme uncovered by the researcher is the challenge of engagement within VRIM. Although VRIM aims to establish an immersive learning environment, participants indicated a disparity between the expected immersive experiences and the actual user experience, especially concerning emotional and intellectual engagement. The researcher emphasises that the primary concern is VRIM's failure to adequately engage learners in a manner that maintains motivation over an extended period. This is significant because engagement is essential for maintaining learner focus, fostering emotional investment, and ensuring effective learning outcomes.

The absence of social presence in the virtual environment is identified as a significant issue, with numerous participants indicating that the solitary characteristics of VRIM diminished the motivation and engagement of the learning experience. This finding highlights significant issues in educational psychology that underscore the role of social interaction in the learning process. Vygotsky's social constructivism theory asserts that learning is most effective in a socially enriched environment, characterised by active engagement in dialogue, collaboration, and co-construction of knowledge among learners. In the case of VRIM, the absence of collaborative interaction restricts its ability to achieve the immersive experience essential for engagement.

Participants specifically indicated dissatisfaction with the lack of dynamic, real-time feedback, which is crucial for meaningful interaction. In educational contexts, particularly through real-time corrective feedback, the role of feedback is crucial for motivating learners, enhancing skill development, and boosting self-efficacy. The lack of immediate responses in VRIM resulted in participants perceiving the environment as static, thereby diminishing the immersive experience intended by VR technology. Research on social presence in virtual learning environments consistently emphasises the importance of active interaction and real-time feedback for improving engagement (Jauregi-Ondarra, Gruber, & Canto, 2021).

This study indicates that, despite the acclaim for VR technology's immersive qualities, the current design of VRIM may fail to engage learners in a manner that promotes sustained long-term motivation. This is especially troubling in language learning environments, where engagement is significantly associated with emotional and cognitive investment. The researcher's findings corroborate prior studies indicating that social interaction, collaborative work, and active participation in a learning community are essential factors influencing engagement (Yadav et al., 2019). The absence of social presence in VRIM restricts engagement and impedes the development of communication skills, a fundamental objective of VR-based language learning.

5.2. Theme 2: Confidence Building Through VRIM

The second major theme that the researcher identifies is the role of VRIM in building communication confidence, particularly among learners who experience social anxiety or who are introverted. On the one hand, the findings suggest that VRIM has a positive impact on self-esteem and communication skills, with several participants reporting reduced

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anxiety and increased confidence when using the platform. This is consistent with Krashen's Affective Filter Hypothesis, which proposes that learners who experience lower anxiety levels are more likely to engage in language learning and, consequently, acquire language skills more effectively. VRIM provided a safe and non-judgmental environment in which learners could practice without the fear of immediate evaluation, which is often a barrier for those with social anxiety.

However, the researcher also notes that this confidence was often seen as fragile. While learners felt more confident in the virtual environment, they expressed doubts about whether they could transfer this confidence to real-world situations. This represents a crucial limitation of VRIM as a tool for language learning. Confidence gained in the virtual environment does not necessarily translate into effective performance in real-world contexts, where the dynamics of communication are more complex and unpredictable. The absence of real-time feedback and social interaction in VRIM, as discussed in the first theme, contributes to this disconnect. In the real world, learners benefit from immediate responses to their efforts, which help to reinforce confidence and guide further development.

Numerous participants indicated a preference for in-person learning, emphasising the need of external validation and prompt feedback in sustaining and bolstering confidence. This corresponds with findings from additional research that have highlighted the significance of social validation and engagement in the learning process (Agarwal et al., 2024). Although VRIM may effectively diminish initial apprehension and establish basic confidence, it cannot entirely duplicate the continuous, dynamic feedback necessary for continued growth and development in authentic language usage.

5.3. Theme 3: Physical and Emotional Discomfort with VRIM

Alongside the technological advancement that VR signifies, study participants reported considerable bodily pain, encompassing eye strain, weariness, and unease from donning the VR gear. This discovery highlights a frequently neglected issue in the development of VR-based educational tools: the physical discomfort that may arise from extended use of VR headgear. Although virtual reality provides significant immersion, this experience incurs physical expenses that may diminish the learning process.

Alongside physical discomfort, participants also experienced emotional dissonance while engaging with avatars in the virtual environment. The lack of non-verbal cues, such as facial expressions and body language, cultivated a sense of emotional detachment from the virtual contacts. The findings align with research indicating that non-verbal communication is essential in face-to-face interactions, facilitating the conveyance of meaning, emotion, and social context (Muijsson et al., 2020). The lack of these cues in VRIM impeded emotional engagement and rendered the virtual interactions less real.

Moreover, the emotional detachment was intensified by the absence of social connection, a crucial element of effective communication. A multitude of participants articulated a preference for enhanced interactive and collaborative functionalities inside VRIM, indicating that the platform's deficiency in enabling dynamic, real-time communication constituted a substantial constraint. This highlights widespread apprehensions in the research regarding the necessity for VR-based language learning environments to more accurately emulate the social dynamics and communicative subtleties of real-world interactions (Jeong & Heisawn, 2021).

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5.4. Theme 4: Frustration with Lack of Feedback

The fourth theme that emerged from the analysis is participants' frustration with the lack of real-time feedback in VRIM. In conventional educational settings, feedback is essential for reinforcing learning, offering guidance, and assisting learners in recognising areas for enhancement. VRIM's lack of immediate corrective feedback hindered learners' ability to evaluate their progress and implement necessary adjustments. This represents a considerable obstacle to language acquisition, as immediate feedback is crucial for the development of skills and the enhancement of confidence.

Frustration regarding the absence of feedback was notably apparent among learners aiming to enhance their language skills. In face-to-face learning, learners receive immediate feedback on their efforts, which reinforces correct usage and addresses errors in real time. The absence of feedback in VRIM resulted in learners having to independently navigate the learning process, thereby hindering their capacity for effective self-assessment and skill improvement. Studies suggest that the absence of immediate feedback in VR-based learning settings may impede the effectiveness of the learning process, particularly in language acquisition (Agarwal et al., 2024)..

5.5. Theme 5: Preference for In-Person Interaction

The concluding topic noticed by the researcher is the participants' inclination towards face-to-face interaction rather than virtual reality immersive media (VRIM). Notwithstanding the prospective advantages of VR as an immersive educational instrument, participants demonstrated a pronounced preference for the immediacy, non-verbal signals, and social presence inherent in conventional face-to-face interaction. This choice signifies a comprehensive comprehension of communication as a multimodal process encompassing verbal interactions and non-verbal signals, including body language, facial expressions, and vocal tone.

The preference for face-to-face learning highlights the limitations of VRIM in replicating the richness of real-world communication. While VRIM offers a high degree of immersion, it cannot fully replicate the depth and complexity of face-to-face interactions, which are essential for effective language learning and communication. The findings from this theme suggest that VRIM, while useful as a supplementary tool, cannot replace the depth and immediacy of traditional learning methods (Agarwal et al., 2024).

5. Conclusion

This study concludes that the Virtual Reality Interactive Module (VRIM) significantly improved students' speaking proficiency and engagement, but only partially alleviated their communication apprehension and speaking anxiety, highlighting the complex nature of affective learning in technology-mediated contexts. Utilising Constructivist Theory, the research effectively contextualised statistical results within the lived experiences of learners in the Malaysian pre-university MUET setting. The qualitative findings indicated that VRIM facilitated significant improvements in speaking proficiency and decreased test-related anxiety, hence affirming its educational efficacy as an immersive and interactive learning instrument. Qualitative insights indicated persistent emotional and technological obstacles, notably increased communication anxiety, restricted real-time feedback, and sporadic engagement, suggesting that VR-based

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interventions alone are inadequate to address the profound emotional and contextual difficulties of language acquisition.

This study concludes that the Virtual Reality Interactive Module (VRIM) significantly improved students' speaking proficiency and engagement, but only partially reduced their communication apprehension and speaking anxiety, highlighting the complex nature of affective learning in technology-mediated contexts. Utilising Constructivist Theory, the research effectively contextualised statistical results within the lived experiences of learners in the Malaysian pre-university MUET setting. The qualitative findings indicated that VRIM facilitated significant improvements in speaking proficiency and decreased test-related anxiety, affirming its educational efficacy as an immersive and interactive learning instrument. Qualitative insights indicated persistent emotional and technological obstacles namely increased communication anxiety, restricted real-time feedback, and sporadic engagement—implying that VR-based interventions alone cannot adequately address the entrenched emotional and contextual difficulties of language acquisition.

Ethics Approval and Consent to Participate

The researchers used the research ethics provided by the Research Ethics Committee of Universiti Teknologi MARA (RECUiTM). All procedures performed in this study involving human participants were conducted in accordance with the ethical standards of the institutional research committee.

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Conflict of Interest

The authors reported no conflicts of interest for this work and declare that there is no potential conflict of interest with respect to the research, authorship, or publication of this article.

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