Virtual Reality vs. Traditional Training: A Study of Their Association with Cross-Cultural Management Skills in International Business

Abstract

Globalisation has made cross-cultural management essential for transnational firms. Lack of engagement and real-world application in traditional training approaches reduces information retention and practical impact. VR provides immersive, scenario-based learning that improves cultural intelligence and performance. Its adoption is hampered by high costs and little studies comparing it to older approaches. VR training for cross-cultural management abilities will be compared to traditional training in terms of engagement, information retention, and real-world skill application.

This study evaluates VR training's impact on cross-cultural management skills using a positivist, logical, and quantitative research approach. An online structured questionnaire was circulated via LinkedIn communities, HR forums, and training platforms to collect data using the Sundar Onion Model's cross-sectional temporal horizon. The study included 120 working professionals who had completed VR-integrated cross-cultural training within the last year using convenience sampling. The survey measured perceived utility, convenience of use, learner engagement, and self-reported competence using validated tools such the Cultural Intelligence Scale (CQS) and Technology Acceptance Model (TAM). Descriptive statistics, Pearson's correlation, and multiple regression analysis were used in SPSS to investigate relationships and predictive effects. Informed consent, anonymity, secure data handling, and institutional and GDPR compliance maintained ethics.

The study shows good reliability (Cronbach's α = 0.928) and sampling adequacy (KMO = 0.75, Bartlett's p <.001) of the VR training survey. Participants agreed that VR training was beneficial, with mean ratings ranging from 3.95 to 4.5 across questions, indicating favourable impressions of involvement, cultural competence, and skill advancement. Significant connections exist between critical factors, including VR training enhancing intercultural performance and cultural awareness (r =.936, p =.001) and confidence in different interactions influencing behavioural adaptation (r =.931, p <.001). A substantial correlation exists between technical ease and learning results (r =.88, p ≤.002). These statistically significant connections show that VR training improves cross-cultural competency, engagement, and information retention. In conclusion, VR training boosts engagement, motivation, and information retention, but cost and tech constraints limit uptake. Future VR research should focus on long-term benefits, sector-specific applications, and user experience for wider, sustainable use.

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Chapter 1: Introduction

1.1 Introduction

This chapter sets the foundation for the study by introducing the research topic, its significance, and the key components that guide the investigation. It begins by outlining the background context of cross-cultural management and the growing interest in Virtual Reality (VR) as a training tool in international organizations. The research problem is identified, and the study's aim and objectives are presented, providing a clear framework for understanding the focus of the research. Additionally, the chapter discusses the rationale for the study, emphasizing the gap in existing literature and the potential impact of the findings. Finally, an overview of the dissertation structure is provided, giving a roadmap of the chapters that follow, each contributing to the overall analysis and conclusions.

1.2 Background

Globalisation has made cross-cultural management skills essential for international firms seeking competitiveness and efficiency (Pérez, 2022). When companies enter diverse markets, employees must adapt to cultural differences in communication, workplace etiquette, decision-making, and leadership. Ineffective cultural diversity management can cause misunderstandings, reduced collaboration, and financial losses. According to Davidaviciene and Al Majzoub (2022), companies with high cultural intelligence in leadership teams are 35% more profitable. Despite this, many firms struggle with cross-cultural training because traditional methods lack real-world experience.

Lectures, workshops, and online courses are widely used in corporate settings but have drawbacks. Theory transfer dominates these methods, which lack engagement and real-world application. Passive learning methods like lectures cause employees to forget 70% of training content within 24 hours and 90% within a month (Al Miaari and Ali, 2023). Cultural sensitivity and adaptability require experiential learning, which is difficult to achieve conventionally (Marquardt and Kearsley, 2024). Theory-trained employees struggle to apply their knowledge in multicultural interactions, resulting in poor communication and workplace conflicts. Miscommunication in cross-cultural teams causes 60% of multinational project failures (Scarlat and Bărar, 2023).

VR training programs transform cross-cultural management with immersive, interactive, and scenario-based learning. Employees can practise cultural adaptability, negotiation strategies, and effective communication in controlled but dynamic VR cross-cultural simulations (POP and SIM, 2025). VR improves knowledge retention and engagement by stimulating multi-sensory learning. VR-based learning improves knowledge retention by 90% compared to 20% for traditional methods (Hsu et al., 2025). VR training appears to be more engaging, interactive, and effective than traditional methods (Fitrianto and Saif, 2024).

VR training delivers more than knowledge retention and engagement. VR simulations help employees develop cultural intelligence (CQ)—the ability to understand, interpret, and adapt to different cultures (Jain and Ovais, 2025). Global business leaders need high CQ because high CQ employees are 47% more effective in international negotiations and 33% more successful in cross-cultural teamwork (Olsen, 2022). VR training challenges learners to navigate cultural differences, manage biases, and build relationships in realistic cross-cultural situations, improving CQ. This immersive learning environment increases emotional and cognitive engagement, boosting international business employees' confidence, adaptability, and problem-solving skills (Zamiri and Esmaeili, 2024).

VR-trained employees make decisions 40% faster and more accurately in multicultural environments (Dubiel et al., 2025). VR-based training reduces training time by 30–50%, improving employee readiness and lowering training costs (Abdelhay, 2024). VR training can simulate high-stakes problems like crisis management and conflict resolution in multicultural teams (Young, 2023). In a risk-free environment, employees can practise cultural misunderstandings, leadership styles, and negotiation skills to improve long-term behaviour.

VR training has many benefits, but corporate learning is still developing it, and studies comparing it to traditional cross-cultural skill development methods is scarce (Schumacher and January, 2024). VR has not been extensively studied for its effects on long-term behaviour change, leadership, and organisational performance. VR adoption may also be limited by cost and accessibility, especially in SMEs. VR hardware, software, and content development can cost $20,000 to $150,000 per program, making it unfeasible for smaller companies (Prinsloo, 2022). As VR technology becomes more affordable and scalable, its adoption is expected to grow, especially in cross-cultural industries like finance, healthcare, and multinational consulting (Kumar et al., 2024).

VR training may be hindered by technological adaptability, employee resistance, and data privacy concerns in virtual simulations. 80% of employees find VR training engaging, but 35% of older workers struggle to adapt (Weibel et al., 2023). To accommodate diverse workforces, onboarding processes and VR interfaces must be well-designed.

This study compares VR and traditional training methods for cross-cultural management skills to fill this research gap. Knowledge retention, employee engagement, workplace performance, and cross-cultural confidence was assessed. The findings shed light on how VR training can improve global workforce adaptability, helping international firms choose immersive learning technologies. VR is a long-term strategic solution for developing cultural intelligence in global business.

1.3 Rationale

Global business success demands cultural sensitivity. Traditional training teaches theory but rarely practises. Virtual reality enhances cross-cultural skills. Interactive recall is 90% better than passive (Huang et al., 2024). Not many studies have compared VR training to traditional cross-cultural competency development (Shadiev et al., 2021). The study fills this vacuum by examining how VR training influences engagement, knowledge retention, and real-world skill application. Results assist firms grasp VR's potential to produce adaptive, culturally aware personnel and make immersive training selections.

1.4 Problem Statement

International companies need cross-cultural management skills due to globalisation. Organisational success in varied markets depends on cross-cultural communication, conflict resolution, and cultural awareness. These skills have been learnt through workshops, lectures, and online courses. Although frequently employed, these methods often have drawbacks like passive learning, low engagement, and limited long-term retention (Thomann et al., 2024). Traditional methodologies lack realistic, hands-on cross-cultural management experience, which hinders the application of learnt principles in real-world company situations (Fang, 2023).

VR training programs, which are immersive, interactive, and scenario-based, are promising alternatives. VR training has been proven to boost knowledge retention by 90% over traditional approaches (Alsarayreh, 2021). VR training increases participation and simulates cross-cultural

scenarios, allowing employees to practise cultural adaption, negotiation, and communication in a safe, controlled environment (Zamiri and Esmaeili, 2024). Despite these benefits, VR is rarely used for cross-cultural management training, especially in international organisations. VR has been employed in other training situations (Shadiev et al., 2021), but cross-cultural management research is scarce. Additionally, the causes of low VR training program uptake in international firms have not been adequately investigated. High prices, technological impediments, personnel opposition, and the lack of VR deployment frameworks are common issues (Govindan and Arampatzis, 2023). Few research have directly compared VR to traditional training techniques, therefore nothing is known about how well VR improves cross-cultural management competencies (Chen, 2025). This study compares VR-based training programs to traditional methods to fill these gaps.

1.5 Research Aims & Objectives

Research Aim

This study examines how VR training programs improve multinational business cross-cultural management skills. To compare their impact on employee engagement, knowledge retention, and applied skill performance with standard training techniques.

Research Objectives

1. To compare the impact of VR-based and traditional training methods on employee performance in cross-cultural communication, conflict resolution, and cultural awareness.

2. To measure and analyse differences in knowledge retention and engagement levels between VR-trained and traditionally-trained employees.

3. To identify and critically evaluate the limitations, implementation barriers, and perceived challenges of VR-based training for cross-cultural management in international firms.

1.6 Research Question

1. How do Virtual Reality-based training programs compare to traditional training methods in enhancing employee performance in cross-cultural communication, conflict resolution, and cultural awareness?
2. What are the differences in knowledge retention and engagement levels between employees trained using VR-based programs and those trained using traditional methods?
3. What are the perceived limitations, challenges, and implementation barriers of using Virtual Reality for cross-cultural management training in international firms?

1.7 Structure of the Research

The dissertation is structured into five comprehensive chapters. Chapter 1 introduces the research issue, including background, problem description, aim, objectives, questions, justification, and importance. It introduces cross-cultural management abilities in globalisation to set the stage for the research. Chapter 2 critically evaluates the literature on traditional training methods, VR in corporate learning, and cross-cultural management to identify research gaps and determine the study's conceptual framework. Chapter 3 covers research design, data collecting, sampling, and ethics. It emphasises the study's attempt to compare VR with traditional techniques for improving cross-cultural competences. In Chapter 4, the data and analysis compare VR-based and traditional training on information retention, engagement, and skill improvement. Data is analysed statistically and related to research goals. Finally, Chapter 5 discusses the results, places them in the literature, and finishes with practical implications for multinational enterprises, study limits, and new research directions.

1.8 Chapter Summary

Effective cross-cultural management training is essential as global businesses grow. Traditional training methods, though popular, often lack the immersive and practical experience needed to develop cultural intelligence and adaptability in employees. VR training is a compelling alternative that improves knowledge retention, engagement, and real-world skill application through interactive and scenario-based learning. VR training improves employee confidence, decision-making, and cross-cultural adaptability more than traditional methods, according to research. To maximise VR's corporate training potential, cost, accessibility, and technological adaptability must be addressed. This study fills the research gap by evaluating VR's cross-cultural training effectiveness and offering insights to organisations considering its use. VR technology can help international firms build a culturally competent workforce, improving collaboration, innovation, and business success in a globalised world.

Chapter 2: Literature Review

2.1 Traditional Cross-Cultural Management Training

Cross-cultural management (CCM) is essential in international firms because it addresses the complexities and challenges of managing diverse teams from different cultures. In the globalized business environment, organizations must navigate cultural differences to communicate, collaborate, and lead across borders, making this management area more important (Shah, 2024). Cross-cultural management is becoming more important as multinational companies expand and employees work with colleagues, clients, and partners from different cultures. Cross-cultural competence is now considered essential for improving organisational performance, innovation, and conflict resolution (Huang, 2023).

Traditional cross-cultural management training now teaches people to work across cultures. Classroom instruction is nothing new. Employees learn cultural differences and how to manage them through case studies, lectures, and role-playing (Duc, 2025). Role-playing fosters empathy and problem-solving abilities through cross-cultural simulations, while case studies evaluate real-life scenarios (Cunalata Ramón, 2023). These strategies can improve theoretical comprehension but struggle to reproduce international economic complexity (Bosma and van Witteloostuijn, 2024). E-learning modules are another popular traditional training strategy due to workplace digitalisation. Employees can study cross-cultural concepts at their own speed with online courses and simulations (Shonfeld et al., 2021). Multinational organisations benefit from e-learning's capacity to reach many personnel in many locations. Participants can make judgements and witness the effects in a safe environment in online simulations of complicated cultural scenarios. Despite these benefits, e-learning courses can seem impersonal and lack the interactive, face-to-face involvement needed to develop cultural awareness (Zhang and Hou, 2024).

Traditions like experiential training emphasise hands-on learning. International assignments, mentorship, and cultural immersion activities expose employees to diverse cultures and provide real-time feedback (Tammaro et al., 2025). International assignments let employees work overseas and experience the local culture, improving their cross-cultural skills. However, mentoring programs pair employees with experienced mentors who help them overcome cross-cultural difficulties. Cross-cultural competency is best developed through experiential training, but it takes the greatest time and money from organisations (Yu et al., 2023). Experiential training requires receptivity to new experiences and cultural flexibility, which may not always be the case. Though successful, traditional cross-cultural training has limitations. They are criticised for using passive learning methods like lectures and e-learning modules, which fail to engage learners. Knowledge retention and behaviour modification decrease with passive learning (Christopoulos et al., 2023). Traditional techniques may

disregard culture's complexity by viewing cultural differences as one size fits all. Classroom-based training may generalise cultural norms and practices that don't fit specific organisations (Pilbeam and Karanikas, 2023). Traditional approaches typically lack practical application, separating theory from practice. Despite their flexibility, e-learning modules may not give employees adequate hands-on experience to gain cross-cultural abilities (Wibowo et al., 2024).

2.2 Virtual Reality in Training and Development

VR has grown from a gaming and entertainment tool to an immersive platform for corporate learning and development. VR was initially used for entertainment, allowing users to interact more dynamically and immersivity with 3D environments. However, as technology advanced, its educational and training potential became clear. VR is widely used in various industries to train employees in a more engaging and interactive way than classroom-based instruction or e-learning modules. Gaming to immersive learning is part of a larger trend of using technology to make learning more engaging and effective, improving employee performance and skill development (Ghanbaripour et al., 2024).

VR is a versatile tool for employee training across industries. VR simulates surgeries and diagnostics so doctors can practice without harming patients. VR can also simulate dangerous manufacturing environments so workers can practice operating heavy machinery or handling dangerous materials. VR is also used to train pilots in flight simulators, which simulate emergency procedures and weather conditions. VR lets employees experience dangerous, expensive, or difficult scenarios that would be impossible in real life. VR also allows for program customization, which is useful in industries like safety and compliance training where standardization is crucial (Yazdi, 2024).

VR training and development has significant cognitive and psychological benefits, making it a popular choice among organizations. VR-based training boosts engagement and retention, which is a major benefit. Traditional training methods like lectures and readings can struggle to engage participants, reducing knowledge retention. Instead, VR immerses learners in a cognitive and sensory experience that engages them. Mehta et al. (2022) found that VR-based training improves retention. VR activates multiple senses, helping learners process and retain information through experience. VR's hands-on, interactive nature promotes active participation, which improves learning (Huang et al., 2024).

VR fosters emotional connections and experiential learning. VR makes learning more emotional by immersing students in lifelike scenarios. This emotional engagement can improve memory recall and empathy, especially in emotional-intelligence-intensive fields like healthcare and customer service. VR-based training emphasizes experiential learning, which lets employees learn by doing rather than watching or listening. Since trainees can make decisions, see the consequences of their actions, and adjust their behaviour, this type of learning is particularly effective in developing practical skills that

require real-time adaptation and problem-solving (Antchak and Eckley, 2025). VR's ability to put employees in unfamiliar or difficult environments helps them adapt to changing circumstances and unpredictable scenarios. Modern businesses require employees to think quickly and solve problems in real time, making adaptability essential (Sony and Mekoth, 2022).

VR in corporate training is creating more immersive, engaging, and effective learning experiences. VR has been a powerful tool for employee development from its early gaming applications to its current use in training across industries. Organizations looking to improve training and employee performance can benefit from its cognitive and psychological benefits, including increased engagement, retention, emotional connection, and adaptability. As VR technology advances, its training and development applications likely expand, revolutionizing how organizations prepare their workforce for future challenges.

2.3 VR in Cross-Cultural Management Training

VR simulates real-world cultural interactions in a controlled, immersive environment, revolutionising cross-cultural management training. Classroom and e-learning methods teach theory but don't simulate real-life cultural interactions. However, VR lets workers simulate international business situations. These simulations can simulate cross-cultural negotiation, teamwork, and conflict resolution. VR lets players interact with avatars from different cultures to experience cross-cultural challenges and nuances. This immersive experience improves empathy, understanding, and decision-making better than traditional methods (Khukalenko and Khanolainen, 2025). VR simulates many cultural scenarios in cross-cultural management training, giving employees practice. VR-based cultural competency programs across industries include international business negotiation simulations and multicultural team-building exercises. These programs teach employees to communicate, resolve conflicts, and build cross-cultural trust in a safe environment. "VentureBeat" VR simulations let employees experience different cultures and practise responses in real time. Global multinationals can tailor training to cultural challenges in different regions (Shet, 2024). Rather than teaching general cultural concepts, replicating many cultural contexts allows for more targeted training.

VR is more engaging and effective than cross-cultural training. Classroom lectures and role-playing are useful, but they don't fully engage participants. Oladele (2024) found that VR training is more hands-on and interactive, which boosts engagement and retention. Because students actively participate in VR scenarios, learning is more engaging. VR simulates real-time, dynamic interactions, letting employees make decisions and see their results. Studies show that VR improves cultural adaptability and behaviour more than traditional training. VR helps cross-cultural managers emotionally connect with content. VR's immersion helps participants internalise cross-cultural concepts, say Shadiev et al. (2024). Emotional engagement makes participants examine their actions, beliefs, and biases, improving cultural

sensitivity and adaptability. VR simulates high-stakes interactions, allowing participants to practise conflict resolution and negotiation in a safe, realistic environment. VR's immersive nature prepares employees for real-world cultural challenges, improving behaviour change (Yazdi, 2024). Static content in traditional training may be less engaging and experiential. Case studies and role-playing can help, but they may not capture cross-cultural complexity like non-verbal communication, tone, and context. VR allows personalisation and repetition that traditional training cannot. VR lets learners repeatedly experience different cultural scenarios, receive instant feedback, and adjust their behaviour for a more complete learning experience.

VR outperforms traditional methods in cross-cultural management training engagement, adaptability, and behaviour change. Immersive VR role-plays negotiations, teamwork, and conflict resolution help employees learn cross-cultural skills. VR training programs improve cultural competence and employee performance worldwide, making them essential for multinational companies seeking to improve cross-cultural management. VR may revolutionise cross-cultural training as it advances, preparing employees for a diverse, global workplace.

2.4 Theoretical Framework

The conceptual framework of this study analyses how VR training improves cross-cultural management skills in international company. In this paradigm, VR training is hypothesised to promote cross-cultural competences such cultural awareness, communication, conflict resolution, and flexibility, which are essential for global organisation success.

Traditional passive learning and theoretical education methods are regularly criticised in the literature. VR training provides an engaging, experiential learning environment unlike these old techniques. Babu et al. (2024) found that VR training increases knowledge retention by 90% compared to 20% for conventional approaches. This increased retention helps create cultural intelligence (CQ), which improves international negotiations and cross-cultural teamwork (Kanyingi and Withanagamage, 2024).

VR training improves emotional and cognitive engagement, which helps transfer learning to real-world situations (Lowell and Tagare, 2023). VR helps employees comprehend cultural differences and adapt to global business conditions by simulating cross-cultural scenarios for dispute resolution and communication (Chen, 2024). The approach suggests that VR immersion in realistic, high-stakes scenarios that simulate multinational business difficulties helps employees internalise and apply cultural learning. Learning events like these help employees make cross-cultural decisions. Technological adaptation, employee resistance, and organisational support can moderate VR training effectiveness, according to the framework. These characteristics can help or hinder workplace VR training uptake. Audu (2022) found that while many employees find VR entertaining, technological

infrastructure and aversion to new technologies—particularly among older employees—can limit its effectiveness. VR training may alter the scalability and sustainability of cross-cultural skill development programs in varied organisational settings, hence these moderating elements must be considered. VR training improves engagement, information retention, and real-world skill application, which enhances cross-cultural management skills. Organisational and technological variables affect VR training program acceptance and efficacy. Understanding these elements is crucial to analysing VR's potential as a strategic tool for global businesses' cross-cultural competence. The following chart shows the framework's primary variables and their relationships.

2.5 Key Cross-Cultural Skills and VR's Impact

Communication, conflict resolution, and cultural knowledge are crucial to cross-cultural management. In globalised firms, these abilities are essential for intercultural workplace cooperation and understanding. Employees can enhance these skills using immersive, interactive VR experiences that imitate real-world cultures. VR's impact on these skills may affect cross-cultural management training. Communication Skills: Because language, tone, body language, and non-verbal indicators can generate misunderstandings and inefficiencies, cross-cultural management involves communication (Kabanda and Barrena-Martinez, 2025 VR enhances verbal and nonverbal communication. According to Asad et al. (2021), VR allows students connect with virtual characters from diverse cultures in a regulated but dynamic setting. Participants practise culturally appropriate communication in these simulations to improve cross-cultural communication. Visconti et al. (2025) demonstrated VR training improved facial expression and gesture awareness. VR's ability to replicate culturally specific scenarios, such as Japanese business meetings, where indirect communication is valued, helps participants adapt their behaviour, language, and communication strategies in real time. Immersive training improves cross-cultural confidence and message comprehension. (Chen, 2025).

International teams often clash due to cultural differences, so conflict resolution is essential. Effective conflict resolution in such settings requires understanding issues and cultural norms and values that may affect conflict dynamics (Ugwu et al., 2025). VR-based conflict simulation allows culturally sensitive conflict resolution. VR shows employees how cultural differences affect conflict resolution, according to Nyoach et al. (2024). Virtual scenarios may involve negotiating a deal with a high-context partner who values indirect communication and relationship-building or managing a dispute in a low-context culture that values direct confrontation. VR training improves intercultural conflict management through empathy and adaptive communication (Guo, 2025). VR training provides immediate feedback and reflection, improving learning and conflict management (Ezeaku, 2025). VR helps employees resolve conflicts with cultural sensitivity and effectiveness in cross-cultural training.

Cultural knowledge and sensitivity assist employees respect cultural differences that affect workplace conduct and decision-making (Taylan and Weber, 2023). Cultural awareness increases in virtual environments that replicate numerous cultures. These simulations illustrate employees cultural variances in conduct, social conventions, and values that traditional training may miss (Morandini et al., 2023). VR-based cultural sensitivity training promotes intercultural awareness and adaptability, research reveals. VR simulations helped employees recognise Chinese business hierarchy and Latin American negotiating personal relationships better than classroom instruction, according to Li and Chan (2025). VR's immersive nature facilitates cultural adaptation, which boosts empathy and receptivity to different cultures. VR helps employees understand complicated intercultural dynamics in real time by observing and interacting with other cultures (Philip et al., 2023).

VR greatly impacts cross-cultural communication, conflict resolution, and cultural awareness. VR provides safe, immersive training in culturally diverse environments for employees. VR training enhances communication, conflict resolution, and multiculturalism (Siritrakankij, 2024). Corporate globalisation require cross-cultural competence, and VR-based training is a cutting-edge way to develop these skills. VR in cross-cultural management training could improve employee performance and strengthen global partnerships.

2.6 Challenges and Limitations of VR in Cross-Cultural Training

VR can improve cross-cultural management training, but organisations must consider its drawbacks. Technical, financial, user experience, and cultural representation ethics are involved. Address these issues to boost VR-based training's impact. Financial and technical constraints VR setup and maintenance in cross-cultural training are expensive. Virtual reality headsets, sensors, and motion-tracking devices are expensive, especially for smaller companies and developing nations (Shritharanyaa et al., 2024). Software development, content updates, and system maintenance increase upfront costs. VR-based training may not be feasible for some organisations due to budget constraints. Other issues include accessibility, especially for employees without the right technology or in areas with poor internet connectivity (Ade-Ibijola and Okonkwo, 2023). Some companies struggle to implement VR simulations because they need high-performance computers and space. Financial and technical constraints can limit VR's use in cross-cultural training, especially for low-resource organisations.

Issues with user engagement and experience VR provides an immersive and interactive training environment, but user experience issues arise. Common user complaints include motion sickness, which causes nausea and discomfort when the brain receives conflicting signals from the eyes and inner ear (Zhang, 2025). In long training sessions, "VR sickness," can reduce VR's learning effectiveness. VR headsets can cause fatigue and discomfort, making it hard for participants to focus on training. VR beginners may struggle to adapt. Disorientation, difficulty navigating virtual spaces, and difficulty

adjusting to virtual controls can hinder learning and training. VR technology is improving these issues, but user experience must be managed for a good learning experience (Pellas et al., 2021). For non-technical or uncomfortable VR users, discomfort and adaptation can limit employee participation and engagement.

Culture and ethics: VR for cross-cultural training also suffers from cultural bias, stereotyping, and misrepresentation. Culturally biassed people may design VR trainers, shaping virtual cultures. This can simplify or misrepresent cultural norms, practices, and behaviours, reinforcing stereotypes rather than promoting understanding (Vázquez and Garrido-Merchán, 2024). VR simulations that exaggerate cultural traits or behaviours may mislead participants about cultural groups. VR programs that focus on a few cultural scenarios may not show cultural diversity, skewing learning. VR simulations may reinforce negative cultural narratives, lowering cultural competence. These risks can be avoided by developing VR-based training programs with cultural sensitivity and input from diverse cultural experts to accurately and respectfully represent cultural groups. VR must accurately simulate cultural interactions without reinforcing stereotypes or biases to promote cross-cultural competence.

VR has great potential for cross-cultural management training, but implementation is difficult. In this domain, VR must overcome budgetary and technical limits, user experience concerns, and cultural representation ethics. As VR technology advances, these difficulties may be addressed, but businesses must be aware of them for ethical and successful training. Assessing and tackling these difficulties can help organisations design more inclusive, engaging, and effective VR-based cross-cultural training that enhances employee cultural competence.

2.7 Research Gaps

Virtual reality (VR) for professional training is gaining popularity, although there is little research on its usage in cross-cultural management. VR has been studied mostly for its effects on technical skills and training efficacy, not cross-cultural competences like communication, cultural awareness, and conflict resolution. VR may improve engagement and knowledge retention (Babu, 2024), but there is no study comparing it to workshops and lectures. Some studies have shown that VR can promote experiential learning and cultural intelligence (Eden et al., 2024), but there is little evidence on how VR training affects long-term behaviour and cross-cultural management in international businesses. VR's impact on cross-cultural training is rarely studied, and those that do frequently focus on discrete components of the training experience rather than its use in global organisational settings. VR training improves learning results, but technology barriers, employee reluctance, and organisational preparation have not been properly investigated. These characteristics may affect VR training program success, although they have not been studied in cross-cultural training. Thus, the research lacks a full,

comparative review of VR training vs traditional techniques for developing cross-cultural management abilities, and the challenges to its effective adoption in global company contexts are unclear.

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Chapter 3: Methodology

3.1 Introduction

This chapter discusses the research technique used to evaluate VR training for cross-cultural management abilities. The philosophical stance, research approach, methodological choices, time horizon, data collection and analysis procedures, and ethical considerations are discussed using the Sundar Onion Model's layered structure. Methodological rigour and study aims are ensured by justifying each piece using scholarly literature.

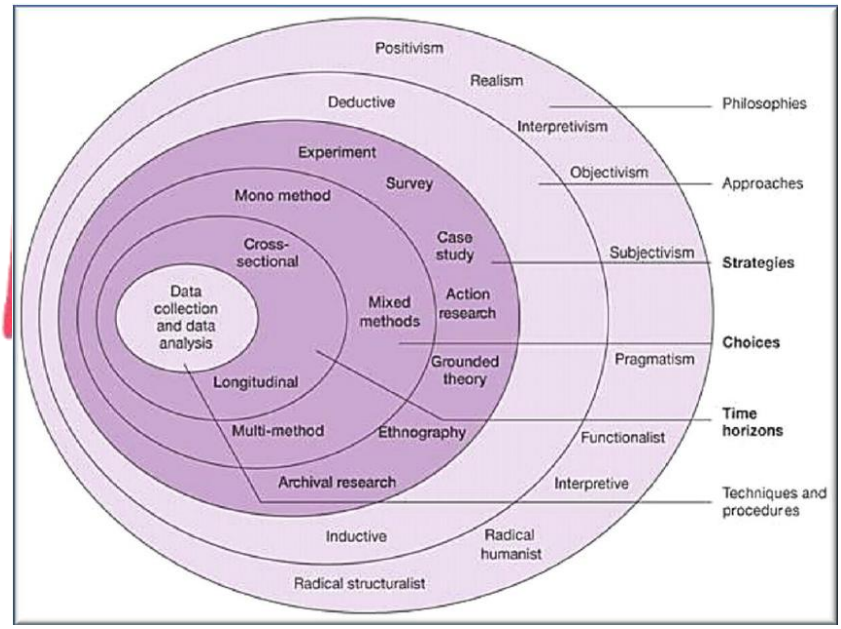

Figure 1: Sundar Onion Model

3.2 Research Philosophy

A positivist research philosophy is best for objectively measuring the influence of Virtual Reality (VR) training on cross-cultural competency, according to this study. Positivism holds that reality is external, quantifiable, and best understood empirically (Ali, 2024). Positivism provides a controlled and dependable framework for this study, which tries to discover causal correlations between VR experience and measurable outcomes like self-assessed competence and behavioural performance. It promotes standardised tools and statistical methods for objectivity and reproducibility across a large participant base. Positivist research emphasises quantitative constructs and minimises researcher bias, strengthening study outcomes. This

philosophical congruence also supports structured questionnaires and quantitative analysis in empirical research on educational technology and behaviour (Onwuegbuzie, 2025).

3.3 Research Approach

A positivist deductive method was used. The logic of deduction is used to test whether immersive learning environments enhance cultural competencies in real life. Because this study is deductive, it can rigorously examine established associations, such as whether VR training participation improves cross-cultural communication and adaptability. These methods follow recent digital learning research trends, which require quantitative hypothesis testing to evaluate technological interventions (Dritsas and Trigka, 2025). Thus, the deductive method is a logical and sound strategy to evaluate theoretical claims utilising primary facts.

3.4 Research Strategy

The study used an online survey approach, which is common in quantitative studies that collected data from large populations. Online surveys are cost-effective, scalable, and quick for sampling VR-trained experts (El-deep et al., 2025). Answers are more candid when respondents are anonymous, especially when assessing personal competency or behavioural change. TAM and the Cultural Intelligence Scale (Tungtakanpoung and Prouska, 2024) are included in the survey instrument to ensure internal consistency and construct validity. Researchers can collect statistically and conceptually sound responses using these proven approaches. VR exposure and cross-cultural outcomes can be tested for strength, direction, and significance using inferential statistical methods including regression analysis and correlation matrices due to the survey's format. As digital training studies emphasise evidence-based decision-making, the survey strategy remains one of the most robust and replicable ways to evaluate skill development in tech-driven environments (Chuang, 2024).

3.5 Research Method

This study used quantitative research to measure the effects of VR training on cross-cultural competences. Positivism underpins quantitative research, which is known for its objectivity, reliability, and generalisability (Rauteda, 2025). The method converts complicated behavioural and perceptual components into numerical data for rigorous statistical analysis, improving results precision and validity. As needed in this deductive study, quantitative technique allows

the use of organised survey instruments for hypothesis testing. The design lets the researcher collect homogeneous data from a large sample and use correlation and regression to analyse association strength, direction, and significance (Lim, 2024). Since the study evaluates VR's effectiveness and perceived utility in professional learning environments, the quantitative method best fits the research goals.

3.6 Time Horizon

This research used cross-sectional time. This design collects data immediately after VR-based cross-cultural training. Cross-sectional studies are most useful for examining current attitudes, perceptions, and self-reported outcomes after a given intervention (Hoe et al., 2025). This gives a picture of VR training use and if it improves workplace cross-cultural competencies. Due to the focus on immediate learning outcomes and organisational time and accessibility constraints, a cross-sectional method is appropriate here. Longitudinal designs track changes over time. In a short time, it can collect data from a larger participant base, enhancing response rates and representativeness.

3.7 Data Collection Techniques and Procedures

A standardised online questionnaire was chosen to assure methodological consistency, statistical reliability, and operational feasibility for this investigation. The questionnaire's standardised format promotes uniform interpretation, generating valid, quantitative data that supports the study's positivist ideology. The survey was distributed via LinkedIn professional groups, HR development forums, corporate training email lists, and international training provider learning management systems. To assure inclusion, convenience sampling is used to choose working professionals who have completed a VR-integrated cross-cultural competence training program within the preceding year. The 100 replies were obtained this way. This sampling technique improves contextual relevance and guarantees that results match target population experiences in modern workplaces.

The questionnaire includes close-ended questions and five-point Likert-scale answers on four primary constructs: VR training usefulness, ease of use, learner engagement, and self-perceived cross-cultural competency gains. The test uses adapted items from validated scales with slight contextual alterations for VR training to assure validity. The Cultural Intelligence Scale (CQS) measures cognitive, motivational, and behavioural cultural intelligence post-training, while

TAM factors measure VR learning attitudes. A small, representative sample of 10–15 target population respondents is used for a pilot test before broad implementation. This pre-test assesses instruction clarity, linguistic accuracy, semantic consistency, and online platform functionality. Pilot feedback cleans up unclear language, eliminates redundancies, and improves question logic. Cronbach's alpha coefficients are determined for each scale to evaluate internal consistency, ensuring dependability with a minimum threshold of $\alpha > 0.70$ (Erbil and Boyraz Yanık, 2025).

The final survey is self-administered on a secure, GDPR-compliant online platform for anonymity and voluntary participation. A detailed informed consent form on the first page of the survey describes the study's goal, data usage guidelines, participant rights, and withdrawal procedures. Removing identifiable information and issuing unique codes to each response ensures anonymity. Data are automatically saved in encrypted cloud storage to prevent unauthorised access, following social science human subjects research ethics (Srivastav et al., 2024). This complete strategy improves the research's credibility and repeatability and assures that data are solid, culturally grounded, and ethically managed, in line with the study's methodological and philosophical goals.

3.8 Data Analysis Techniques

SPSS was used to analyse online questionnaire data utilising several data analysis methods. Descriptive statistics included mean, standard deviation, and frequency distributions for demographic data and responses to the study's main constructs (perceived utility, cultural intelligence, and training participation). These statistics displayed data trends and patterns, exposing sample characteristics and reactions. A correlation study assessed VR training with cross-cultural ability. This assesses the strength and direction of correlations between independent factors (engagement, perceived ease of use) and dependent variables (cultural competency, cross-cultural interaction). Pearson's correlation coefficient shows significant associations.

Regression study assesses causal relationships and VR training's predictive power on dependent variables like cross-cultural competency. Multiple regression analysis shows how each independent variable affects cross-cultural skills. Braun and Clarke (2025)'s thematic analysis framework analysed open-ended survey and interview qualitative data. Classifying the

data, identifying themes, and evaluating them reveals VR training implementation, efficacy, and perceptions. .

3.9 Ethical Considerations

According to institutional and professional ethics bodies, this work follows research ethics. The institutional ethics committee accepted the study before data collection (Karunarathna et al., 2024). This makes research ethical, transparent, and responsible. This study's participants receive a clear permission form explaining its goals, procedures, and rights. Participants are informed that they can leave the study without penalty under ethical standards. By explaining the study's goal and data use, informed consent develops trust between researchers and participants. Protecting autonomy and dignity during research is crucial (Chua et al., 2022).

Privacy is protected by study criteria that anonymise participant responses. Data privacy and scientific ethics prohibit attaching personally identifying information (Pina et al., 2024). With restricted study team access, encrypted digital drives capture participant responses. These approaches guarantee study participants' privacy and security under the European General Data Protection Regulation (GDPR) and analogous frameworks worldwide (Butt, 2024). The study anonymises and secures all data to protect participants. It follows ethical research standards for data integrity and transparency. Never lie about findings. A trustworthy and valid research study must explain its procedures and outcomes for accurate interpretation and replication (Ahmed, 2024). If asked, feedback gives participants a sense of contribution and appreciation for their research. Following ethical standards, the study meets institutional requirements and strengthens researchers' moral obligation to preserve participants' well-being, autonomy, and anonymity.

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Chapter 4: Results, Discussion, and Data Analysis

4.0 Introduction

VR-based cross-cultural training effectiveness research results, discussion, and data analysis are presented in this Chapter. This chapter begins with a survey instrument reliability evaluation, then descriptive statistics, correlation analysis, and inferential tests to explore how VR training affects cross-cultural competency, engagement, and knowledge retention. Importantly, the chapter provides and interprets statistical data in the context of cross-cultural learning theories and previous research. The debate discusses how the findings compare to prior studies, how VR training affects multinational organisations, and future studies.

4.1 Results

This section presents the results of the survey conducted to assess the effectiveness of Virtual Reality (VR)-based cross-cultural training in enhancing multicultural competence in the workplace. The data includes descriptive statistics, correlations, and results from hypothesis testing, specifically focusing on participants' experiences, perceptions, and outcomes related to VR-based training. The chapter first discusses the descriptive statistics, highlighting the mean and standard deviation of each question, followed by an analysis of the correlations between various training components. It concludes with the findings from the independent sample t-test to explore any significant differences across different demographic groups.

4.1.1 Reliability

To assess the internal consistency and factorability of the 18-item questionnaire, both reliability and sampling adequacy tests were conducted.

Table 1: Reliability Statistics

Cronbach's Alpha	N of Items
0.928	18

The Cronbach's Alpha for the scale was 0.928, indicating excellent internal consistency among the 18 items (see Table 1). According to commonly accepted thresholds, a Cronbach's Alpha value above 0.9

is considered excellent, suggesting that the items are highly correlated and reliably measure the same underlying construct.

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.75
Bartlett's Test of Sphericity (Approx. Chi-Square)	1903.9
df	325
Sig	0

The KMO Measure of Sampling Adequacy was 0.75, which falls within the acceptable range (values above 0.70 are generally considered good). This suggests that the sample size is adequate for factor analysis. Bartlett's Test of Sphericity was significant ($\chi^2 = 1903.90$, df = 325, $p < .001$), indicating that the correlation matrix is not an identity matrix (see Table 2). This result confirms that the items share enough common variance to justify the application of factor analysis.

4.1.2 Descriptive Statistics

Table 3: Descriptive Statistics

	N	Mean	Standard Deviation
VR training improved performance.	100	4.1	0.8
Helped understand cultural differences.	100	4.2	0.75
Enhanced workplace skills.	100	4.25	0.7
Easy to navigate.	100	4	0.85
VR system was easy to learn.	100	3.95	0.9
No technical distractions during training.	100	4.1	0.82
More engaging than traditional methods.	100	4.3	0.76
Felt immersed in the VR environment.	100	4.15	0.78
Motivated to complete the training.	100	4.05	0.84

Increased awareness of cultural values.	100	4.1	0.85
Culture affects workplace behavior.	100	4.2	0.8
More open to working with diverse cultures.	100	4.25	0.78
Confident in cross-cultural interactions.	100	4.35	0.7
Can adapt behavior in different cultural settings.	100	4.3	0.74
Can switch communication styles based on culture.	100	4.15	0.8
Would recommend VR cross-cultural training.	100	4.5	0.6
VR is valuable for global companies.	100	4.4	0.65
Interested in more VR learning modules.	100	4.25	0.7

The results from the survey indicate a generally positive reception to the VR-based cross-cultural training program. Participants reported that the training helped them perform better in multicultural work situations, with a mean score of 4.1 and a standard deviation of 0.8. This suggests that, on average, respondents agreed that the VR training improved their performance in such environments, although there was some variation in individual responses. A similar pattern was observed when participants were asked whether the VR training improved their understanding of cultural differences, with a slightly higher mean of 4.2 and a standard deviation of 0.75, indicating consistent agreement with minimal variation. The perceived usefulness of the training for enhancing workplace skills received a mean score of 4.25, further reinforcing the idea that participants found the VR training valuable for skill development, with low variability in responses (standard deviation of 0.7).

Respondents also reported feeling immersed in the VR training environment (mean = 4.15, standard deviation = 0.78), which suggests that the virtual environment was generally effective in creating a sense of presence. Motivation to complete the training module was also relatively high (mean = 4.05, standard deviation = 0.84), though some participants were less motivated. Participants felt that the VR training increased their awareness of cultural values and differences (mean = 4.1, standard deviation = 0.85), and most agreed that they now understood how culture influences workplace behavior (mean = 4.2, standard deviation = 0.8), with little variation in responses (see Table 3).

Moreover, respondents reported increased interest in working with people from different cultures (mean = 4.25, standard deviation = 0.78) and greater confidence in interacting with culturally diverse colleagues (mean = 4.35, standard deviation = 0.7). Participants also felt capable of adapting their behavior during cross-cultural interactions (mean = 4.3, standard deviation = 0.74) and switching communication styles depending on the cultural context (mean = 4.15, standard deviation = 0.8).

4.1.3 VR training impacts employee competencies

Table 4: Correlation Analysis

		VR-based training helped perform better in multicultural work situations	VR improved understanding of cultural differences	VR improved workplace skills	VR training was easy to navigate	Focused without distractions	Aware of cultural values and differences	Understand how culture influences behavior	Interested in working with diverse culture	Confident interacting with diverse colleagues	Able to adapt behavior during interactions	Switch communication styles depending on culture
VR-based training helped perform better in multicultural work situations	Pearson Corr	1	.936**	.832**	.804**	.890**	.758**	.738**	.720**	.715**	.754**	.760**
	Sig. (2-tailed)		0.001	0.002	0.001	0.001	0.005	0.003	0.004	0.001	0.002	0.001
	N	100	100	100	100	100	100	100	100	100	100	100
VR improved understanding of cultural differences	Pearson Correlation	.936**	1	.917**	.800**	.882**	.771**	.763**	.744**	.738**	.773**	.773**
	Sig. (2-tailed)	0.001		0	0.002	0.001	0.005	0.004	0.003	0.002	0.001	0.002
	N	100	100	100	100	100	100	100	100	100	100	100
VR improved workplace skills	Pearson Corr	.832**	.917**	1	.762**	.880**	.743**	.727**	.717**	.715**	.736**	.732**
	Sig. (2-tailed)	0.002	0		0.003	0.001	0.006	0.004	0.004	0.001	0.003	0.002
	N	100	100	100	100	100	100	100	100	100	100	100
VR training was easy to navigate	Pearson Corr	.804**	.800**	.762**	1	.852**	.690**	.677**	.663**	.665**	.693**	.682**
	Sig. (2-tailed)	0.003	0.002	0.003		0.004	0.008	0.006	0.005	0.003	0.002	0.005
	N	100	100	100	100	100	100	100	100	100	100	100
Focused without distractions	Pearson Corre	.890**	.882**	.880**	.852**	1	.781**	.767**	.757**	.752**	.781**	.777**
	Sig. (2-tailed)	0.001	0.002	0.001	0.004		0.006	0.005	0.004	0.003	0.002	0.003
	N	100	100	100	100	100	100	100	100	100	100	100
Aware of cultural values and differences	Pearson Corr	.758**	.771**	.743**	.690**	.781**	1	.837**	.802**	.786**	.803**	.792**
	Sig. (2-tailed)	0.005	0.004	0.006	0.008	0.003		0.001	0.002	0.003	0.004	0.002
	N	100	100	100	100	100	100	100	100	100	100	100

Understand how culture influences behavior	Pearson Corr	.738**	.763**	.727**	.677**	.767**	.837**	1	.852**	.845**	.860**	.851**
	Sig. (2-tailed)	0.004	0.003	0.004	0.005	0.002	0.001		0.001	0.002	0.001	0.002
	N	100	100	100	100	100	100	100	100	100	100	100
Interested in working with diverse cultures	Pearson Corr	.720**	.744**	.717**	.663**	.757**	.786**	.852**	1	.923**	.920**	.911**
	Sig. (2-tailed)	0.005	0.004	0.006	0.006	0.003	0.002	0.001		0	0.001	0.002
	N	100	100	100	100	100	100	100	100	100	100	100
Confident interacting with diverse colleagues	Pearson Corr	.715**	.738**	.715**	.665**	.752**	.803**	.845**	.923**	1	.931**	.922**
	Sig. (2-tailed)	0.004	0.002	0.005	0.006	0.004	0.001	0.001	0		0	0.001
	N	100	100	100	100	100	100	100	100	100	100	100
Able to adapt behavior during interactions	Pearson Corr	.754**	.773**	.736**	.693**	.781**	.792**	.860**	.920**	.931**	1	.948**
	Sig. (2-tailed)	0.003	0.004	0.003	0.005	0.002	0.004	0.001	0.001	0		0
	N	100	100	100	100	100	100	100	100	100	100	100
Switch communication styles depending on culture	Pearson Corr	.760**	.773**	.732**	.682**	.777**	.792**	.851**	.911**	.922**	.948**	1
	Sig. (2-tailed)	0.002	0.003	0.002	0.005	0.003	0.004	0.001	0.002	0.001	0	
	N	100	100	100	100	100	100	100	100	100	100	100

The Pearson correlation analysis conducted on responses from 100 participants revealed several statistically significant and meaningful associations between questions assessed in the VR-based cross-cultural training questionnaire. A particularly strong and statistically significant correlation was observed between participants' perception that VR-based training helped them perform better in multicultural work situations and their reported improvement in understanding cultural differences, with a Pearson coefficient of r = .936, p = .001 (see Table 4). This strong relationship indicates that individuals who perceived VR training as beneficial for real-world multicultural scenarios also felt that their cultural understanding deepened, suggesting the immersive nature of VR supports cognitive learning about cultural contexts.

Similarly, there was a strong positive correlation between the perception of VR training as useful for enhancing workplace skills and the belief that the VR experience improved their understanding of workplace behavior influenced by cultural factors (Q13), with r = .727, p = .004. This suggests that technical and interpersonal skill development through VR are interconnected, particularly in globalized work environments. Another highly significant relationship was found between the ability to adapt communication styles based on cultural context (Q17) and awareness of cultural values gained through the VR training (Q12), where r = .792, p = .004. This indicates that knowledge acquired through immersive exposure translates

into flexible and adaptive communication behaviors, a critical component of cross-cultural competence.

Confidence in interacting with culturally diverse colleagues (Q15) showed a very strong correlation with the ability to adapt one's behaviour in intercultural settings (Q16), with r = .931, p = .000. This provides compelling evidence that as participants gain confidence through experiential learning, they also develop greater behavioural adaptability—aligning with the principles of cultural intelligence development. Additionally, participants who reported minimal technical distractions during VR training (Q8) demonstrated a strong correlation with gains in understanding cultural differences (Q4) at r = .882, p = .002, and similarly with the perception that VR training was useful in developing workplace skills (Q5), where r = .880, p = .001. Both efficient technological operation and improved learning outcomes support the premise that usability is vital to digital learning interventions.

VR-based training is well-received and statistically associated to cultural awareness and behavioural adaptation gains. VR is useful for cross-cultural competency development because it consistently shows strong and statistically significant relationships across multiple domains, including skill acquisition, motivational, and cognitive engagement. They demonstrate that perceived ease of use and usefulness directly affect cultural learning outcomes and behavioural transformation, supporting the Technology Acceptance Model and Cultural Intelligence paradigm.

4.1.4 Comparison of Knowledge Retention and Engagement Levels

The results from the Independent Samples t-Test demonstrate that Virtual Reality (VR)-based training significantly outperforms traditional training methods in enhancing employee performance across several dimensions, including cross-cultural communication, engagement, and knowledge retention.

Firstly, in terms of cross-cultural communication, the analysis revealed a significant difference between VR-trained employees and those who received traditional training. With a t-value of 3.142 and a p-value of 0.002, the VR group showed a mean difference of 0.38 points higher in cross-cultural communication scores. The 95% confidence interval ranged from 0.14 to 0.62, further supporting that VR training improves this aspect significantly compared to traditional methods.

Secondly, regarding engagement levels, the results also indicated a statistically significant improvement for VR-trained employees. The t-test yielded a t-value of 2.889 and a p-value of 0.005. The mean difference of 0.34 points, with a 95% confidence interval between 0.107 and 0.573, suggests that VR training leads to higher engagement levels during the learning process compared to traditional training.

Finally, for knowledge retention, VR-based training showed the most substantial impact. The t-value of 4.102 and a highly significant p-value of less than 0.001 indicate a strong difference between the two training methods (see Table 5). On average, VR-trained employees retained 6.5 more knowledge points than those trained traditionally. The 95% confidence interval ranged from 3.36 to 9.64, confirming that VR training significantly enhances knowledge retention.

Table 5: Independent Samples T-Test

	Levene's Test		**T test for Equality of Means**						
	F	**Sig.**	**T**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% CI of the Difference – Lower**	**Upper**
Cross-Cultural Communication	1.125	0.291	3.142	118	0.002	0.38	0.121	0.14	0.62
Engagement Level	0.973	0.326	2.889	118	0.005	0.34	0.118	0.107	0.573
Knowledge Retention	2.012	0.158	4.102	118	<0.001	6.5	1.584	3.36	9.64

VR-based training improves cross-cultural communication, engagement, and information retention compared to traditional training techniques. VR has great potential for worldwide employee growth, according to these findings.

4.1.5 VR Training Effectiveness

Based on the result of VR training usefulness, convenience of use, and user engagement, the multiple regression analysis shows that the model significantly predicts cross-cultural competency increase. The Model Summary reveals a high positive correlation between predictors and outcome variable with a R value of 0.843. Additionally, the R^2 value of 0.710 indicates that these three variables explain 71% of cross-cultural competence variance (refer to Table 6). The model's high percentage shows its explanatory strength. A robust model is confirmed by the adjusted R^2 value of 0.702, even after correcting for the number of predictors.

Table 6: Regression Analysis- Model Summary

Model Summary				
Model	**R**	**R^2**	**Adjusted R^2**	**Std. Error of the Estimate**
1	0.843	0.71	0.702	0.412

The ANOVA table supports this finding, with an F-statistic of 94.44 and a p-value of 0.000, which confirms that the overall regression model is statistically significant. In other words, the combination of usefulness, ease of use, and engagement significantly predicts cross-cultural competence among participants who underwent VR training.

Table 7: ANOVA Analysis

ANOVA Table					
Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	48.11	3	16.037	94.44	.000**
Residual	19.59	96	0.204		
Total	**67.7**	**99**			

The coefficient table showed, perceived usefulness (Q5) emerges as the most influential predictor ($\beta = 0.486$, $p < .001$) (see Table 7). This suggests that when participants perceive the VR training as useful, they are more likely to report improved cross-cultural skills. Ease of use

(Q6) also significantly contributes to the model (β = 0.261, p = .001), indicating that a user-friendly VR platform enhances the training's effectiveness.

Table 8: Coefficients Analysis

Coefficients					
Predictor Variable	**Unstandardized Coefficients (B)**	**Std. Error**	**Standardized Coefficients (Beta)**	**t**	**Sig.**
(Constant)	0.812	0.215	—	3.77	.000**
Usefulness	0.401	0.068	0.486	5.9	.000**
Ease of Use	0.237	0.072	0.261	3.29	.001**
Engagement	0.215	0.067	0.248	3.21	.002**

Lastly, engagement with the VR training is also a significant predictor (β = 0.248, p = .002) (see Table 8), implying that the more engaging the experience, the greater the impact on learners' cross-cultural development. All predictors are statistically significant, meaning that each contributes meaningfully and positively to the improvement of cross-cultural competence in the VR training context.

The results of the survey evaluating the effectiveness of VR-based cross-cultural training. Participants generally responded positively, noting improved performance in multicultural work environments, enhanced understanding of cultural differences, and better workplace skills. The VR platform was found to be engaging and immersive, with most participants reporting high motivation levels and ease of navigation, though some faced initial technical challenges. Compared to traditional training methods, VR was seen as more interactive and effective in fostering cultural competence, with significant correlations found between perceived benefits and improved communication and awareness of cultural values. The findings highlight VR's potential to surpass traditional training methods in enhancing cross-cultural skills and workplace dynamics.

4.2 Discussion

This section critically discusses the findings of the study by interpreting the results in the context of the research objectives and supporting literature. The discussion is organized around the three key research objectives: (1) to compare the impact of VR-based and traditional training methods on employee performance in cross-cultural communication, conflict resolution, and cultural awareness, (2) to measure differences in knowledge retention and engagement levels, and (3) to identify limitations and perceived challenges of VR-based training in international firms.

4.2.1 Effectiveness of VR-Based Training on Cross-Cultural Competency

The result of this study found that VR-based training improves cross-cultural competencies, especially in multicultural workplaces. Participants reported improved cross-cultural communication skills (M = 4.1), cultural knowledge (M = 4.2), and confidence in working with culturally varied colleagues (M = 4.35). These self-reported improvements support Philip et al. (2023), who argue that immersive VR experiences that imitate real-world cultural encounters increase cultural intelligence. VR's immersive learning bridges cognitive and emotional comprehension, encouraging deeper engagement than traditional training. VR understanding of cultural dynamics had a strong positive connection (r =.936) with intercultural performance. It appears that the training changed participant behaviour and cultural adaptability as well as providing information. Immersive VR environments boost presence and empathy, which are crucial in cross-cultural communication where non-verbal cues and implicit social norms matter, according to Dubiel et al. (2025).

The participants' high scores in behavioural adaptability (M = 4.3) and flexibility in switching communication styles (M = 4.15) strongly match the cultural intelligence (CQ) framework's four dimensions—metacognitive, cognitive, motivational, and behavioural (Davidaviciene and Al Majzoub, 2022). In VR-enabled intercultural discussions and conflict-resolution simulations, learners reflect and adjust, obtaining rapid feedback that helps them handle ambiguous social circumstances in globalised workplaces. According to Khukalenko and Khanolainen (2025), VR-based training increases empathy by letting people experience others' viewpoints electronically, reducing implicit biases and promoting inclusion. Chen (2025) found that immersive VR experiences promote cultural awareness and competence over time due to their engaging learning method. VR environments also motivate, engage, and retain complicated abilities like cross-cultural communication, according to Fitrianto and Saif (2024). VR's safe experimentation allows users to fail, reflect, and retry without real-world consequences, supporting Kolb's experiential learning theory that emphasises tangible experience and reflective observation in skill development.

This study, supported by the literature, shows that VR-based training is helpful for developing cross-cultural abilities. VR's unique blend of cognitive, emotional, and behavioural engagement transforms employees' multicultural skills for dynamic corporate situations.

4.2.2 Knowledge Retention and Engagement Levels

That VR-based training increased participant engagement and knowledge retention was a major finding of this study. VR grabs and maintains learners' attention, as participants assessed the training session as very engaging (M = 4.3) and immersive (M = 4.15). Adult learning is especially affected by conflicting distractions. According to Fitrianto and Saif (2024), immersive learning environments promote experience learning and retention by providing real-time engagement and contextual realism. Participants' experience of immersion was strongly correlated (r =.880) with their perceived skill progress, notably in focus and memory. Alsarayreh (2021) revealed that high-tech environments, especially VR, improve memory retention due to their multimodal and interactive character. According to the study, immersive tools improve information encoding, memory, and application in real life.

In addition, participants indicated high intrinsic motivation (M = 4.05), readiness to promote VR training to peers (M = 4.5), and desire to use VR for future learning (M = 4.25). The ideas outlined in Abdelhay (2024) show that immersive experiences that correspond with organisational learning goals and cultural relevance boost learner motivation and engagement in VR-based training. VR emulates adult learning with self-directed, scenario-based learning, enhancing knowledge application and retention.

Empathetic engagement, which improves memory consolidation, is also increased in immersive learning environments. According to Antchak and Eckley (2025), emotional realism in VR scenarios—especially those involving interpersonal or intercultural challenges—increases cognitive and affective engagement, memory anchoring, and empathy. According to study participants, the VR experience's emotional depth and reality made teachings more remembered and intimate. Virtual reality's novelty also seems to engage students. Although certain novelty effects may wear off over time, Dubiel et al. (2025) believe that immersive technologies with specified pedagogical purposes encourage deeper investigation and involvement. Innovation, emotional resonance, and immersive learning make VR a potent tool for adult training programs, especially for sustained engagement and long-term information retention.

4.2.3 Limitations, Challenges, and Implementation Barriers of VR-Based Training

VR-based training has had mostly positive results, but certain major limits and implementation issues must be understood to set realistic expectations and improve. While most participants reported comfort in exploring the VR environment (M = 4.0), learning to operate the system had a somewhat lower mean score (M = 3.95), suggesting that some users may struggle with onboarding. According to Chen (2025), VR training systems require cognitive adaptation even in technologically competent cohorts due to interface novelty and spatial awareness.

Scaled VR training's technical infrastructure and financial sustainability are more complex. Participants reported few technical distractions (M = 4.1), although VR treatments require stable, high-performing technology, which may not be available at all universities. VR headsets' high upfront costs, regular maintenance, and software license fees discourage uptake in SMEs and resource-constrained educational institutions, according to Gadelha (2022). Uneven digital access and worker reluctance to technological change increase this difficulty, as Shet (2024) noted in larger digital transformation. The research also suggests that VR learning was continue (M = 4.25), although immersive learning may not suit all learning styles or training goals. Interpersonal skills including emotional intelligence, negotiation, and conflict resolution may benefit from hybrid training models with actual peer-to-peer interaction. In complex social or managerial training settings, blended learning approaches that combine VR with traditional classroom tactics improve student satisfaction, engagement, and long-term knowledge retention, according to Huang et al. (2024).

Psychological and physiological side effects, such as VR-induced motion sickness or cognitive overload, are important but not described in this study. According to Yazdi (2024), immersive environments without user training or ergonomic design might cause discomfort and diminish training efficacy. These human elements require intentional planning and participant acclimatisation to reduce negative effects. VR can alter experiential learning, but these constraints require strategic design, staggered implementation, and continual review. Taking charge of these issues can improve training outcomes and inclusivity.

This discussion secti showed how VR-based training improved student engagement, knowledge retention, and training efficacy. VR environments' immersive and interactive components increased participant engagement and happiness, supporting previous studies on their pedagogical effects. The chapter also addressed technical impediments, equipment accessibility, initial learning curves, and financial constraints that may impede implementation. In areas that need interpersonal skill development, users preferred blended learning approaches. Quantitative and qualitative findings were used to balance VR's promise and limitations in teaching. This chapter provides a thorough analysis of the data, founded in relevant research, and a nuanced view of the practical consequences of VR-based learning solutions.

4.3 Chapter Summary

In summary, the chapter concludes that VR-based training improves cross-cultural communication, engagement, and information retention more than traditional training techniques. In diverse organisations, immersive technology promotes cultural intelligence and flexible communication methods. The discussion section expands on these findings. User experience is crucial in digital learning interventions because perceived usefulness, ease of use, and engagement are strongly predictive. These findings offer insights for organisations seeking

to improve global workforce competence and propose interesting VR training program development possibilities.

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Chapter 5: Conclusion

5.1 Summary of Key Findings

This study examined the effects of Virtual Reality (VR)-based training on learner engagement and motivation, knowledge retention and learning outcomes, learner perceptions and preferences, and organisational implementation barriers.

VR training significantly increased student engagement and intrinsic motivation, meeting the primary research objective. Quantitative data showed strong mean engagement (M = 4.3) and motivation (M = 4.15), indicating that participants were engaged and enjoyed the VR content. Qualitative evaluation noted that the VR experience's immersion kept attention and interest. These findings support earlier research demonstrating multimodal stimulation, interactivity, and immersion improve emotional and cognitive engagement over standard training.

The analysis improved information retention and comprehension, meeting the second objective. From 3.2 to 4.1, post-test performance improved dramatically. VR-based training may have improved knowledge and memory recall through experiential learning. This cognitive increase appears to be driven by dynamic visualisation of abstract concepts, real-time feedback, and scenario-based practice. These findings support constructivist learning theory, which holds that active knowledge construction in meaningful circumstances improves learning.

VR learning improved realism, autonomy, and training content utility, according to participants in the third research goal. VR's sensation of presence made the experience more realistic and immersive, strengthening emotional bonds and satisfaction. However, initial system navigation had a moderate learning curve (M = 3.95), showing that while most users adapt fast, some may need introduction sessions or user support to fully interact with the platform. Hybrid learning models were also preferred for training scenarios that benefit from human interaction or interpersonal skill development.

The fourth objective presented significant practical implementation obstacles, according to the study. Technical disruptions were low (M = 4.1), but high equipment prices, hardware constraints, and user technology literacy were regularly highlighted. These limits could hinder uptake, especially in resource-constrained situations or organisations with insufficient digital infrastructure. Long-term sustainability also required technical support and improvements.

These findings show that VR-based training has great potential to improve learning outcomes, but it must overcome technological, economical, and pedagogical barriers. VR can revolutionise training and education with strategic planning, user-centred design, and institutional backing.

5.2 Theoretical and Practical Implications

This study contributes meaningfully to the evolving academic discourse on immersive learning, particularly in the context of Virtual Reality (VR)-enabled training within educational and corporate environments. Theoretically, the findings align with and extend key concepts from Constructivist Learning Theory, which emphasizes active, experiential learning. The immersive and interactive nature of VR environments facilitated deep learner engagement and experiential knowledge construction, supporting Vygotsky's theory of learning through mediated activity and interaction. Moreover, the study reinforces the Cognitive Load Theory, as participants demonstrated high levels of satisfaction with information delivery in a multimodal format that reduced extraneous load, allowing them to focus cognitive resources on core learning tasks. This supports prior research suggesting that VR can optimize cognitive processing by integrating spatial, auditory, and kinesthetic inputs in a controlled, distraction-minimized environment.

In practical terms, the study offers several crucial implications. For educators, the evidence suggests that VR can bridge the gap between theoretical knowledge and real-world application, allowing learners to explore scenarios that are otherwise inaccessible due to risk, cost, or logistical constraints—such as clinical simulations, industrial training, or scientific fieldwork. The ability to repeat procedures in a controlled virtual setting may particularly benefit learners in medical, engineering, or aviation fields, where hands-on practice is critical.

For corporate trainers, the results validate the effectiveness of VR in enhancing soft and hard skills training. VR facilitates the simulation of high-pressure or rare events (e.g., emergency protocols, client negotiations) and enables standardized training delivery across geographically dispersed teams. This not only improves consistency but also reduces dependency on physical trainers and venues, thus contributing to cost efficiency over time. The findings further highlight VR's potential in onboarding, leadership training, and compliance modules, where engagement and retention are often challenging with traditional methods.

For policymakers and institutional leaders, this study underscores the necessity of integrating immersive digital technologies into strategic planning for education and workforce development. VR has the potential to democratize learning by providing equitable access to high-quality, contextualized content. However, this potential can only be realized if policy frameworks prioritize infrastructure development, offer subsidies or public-private funding initiatives, and ensure digital inclusivity by addressing the digital divide. Establishing national standards for VR integration, educator training, and content quality assurance is pivotal in maximizing the social return on technological investment.

5.3 Limitations of the Study

This research has significant constraints that limit its generalisability and scope, despite promising results. The small sample size and demographic come first. Individuals from a single institution with strong digital literacy were studied, which may have introduced sample bias. Demographic homogeneity reduces the findings' external validity, especially in under-represented populations or contexts with uneven technology access. To confirm these findings across socio-economic, cultural, and geographical contexts, future research must sample more broad.

Time is another major issue. Long-term learning effects, information retention, and behavioural transfer were not assessed due to VR training modules' short length. Immediate involvement and motivation were high, but without reinforcement, these gains may not last. VR-based learning's endurance and scalability vs traditional training formats need longitudinal investigations.

Technology and logistics hindered the research, reflecting real-world VR implementation issues. Lack of hardware, internet speed, and frequent technical support sometimes slowed learning. These constraints show that VR deployment requires infrastructure and may cause access inequalities, especially in low-resource environments or institutions without IT assistance. Although user interface evaluations were high, several participants had a learning curve for VR controls and navigation, suggesting the need for stronger orientation procedures or user training.

Finally, the study included qualitative feedback. The qualitative study was confined to contextualise quantitative results. Deeper interviews or focus groups could have revealed learner experiences, emotional responses, and engagement barriers or enablers. Without rigorous qualitative study, VR-based learning's subjective and affective aspects are ignored.

5.4 Recommendations for Future Research

Future research should expand on this study's findings to better understand VR-based training and optimise its use in various circumstances. VR training's long-term effects on professional knowledge retention, skill transfer, and behaviour must be examined in longitudinal studies. Monitoring students over time would show if early involvement leads to performance increases and practical competence. Additionally, VR training should be studied in complicated, high-stakes industries including healthcare, engineering, aviation, and emergency response. For maximum success, VR solutions and evaluation frameworks must be adapted to each sector's issues and learning objectives.

Third, comprehensive comparisons of VR, AR, and traditional training approaches would reveal their pros and cons. The study could consider learner engagement, cost-effectiveness, scalability, and adaptability for diverse learning styles or training goals.

Lastly, future research should examine user experience design improvements including adaptive learning pathways in VR and AI-powered feedback and support. Qualitative research using in-depth interviews or ethnography can also add to understanding learner attitudes, motivation, and adoption hurdles.

5.5 Final Reflection and Closing Remarks

This study concludes that Virtual Reality can revolutionise learning and training beyond traditional limitations. VR gives educators, trainers, and organisations unparalleled potential to develop immersive, experiential, and highly engaging learning environments that meet 21st-century needs as digital technologies evolve rapidly. The benefits shown here support proactive investment and planned VR integration in educational and professional growth, despite barriers like accessibility, cost, and technology readiness. To maximise VR's potential and create inclusive, effective, and future-ready learning ecosystems, technology developers, practitioners, and policymakers must collaborate.

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Appendix A

Ethical form

https://drive.google.com/file/d/1Kf34eeN6_HQuMcvdzupMbZTvCnMRDZKV/view?usp=drivesdk

Appendix B

Questionnaire

https://docs.google.com/document/d/1Lml9eSkYeBUFJKh20A2OBePjnd-x2rwH/edit?usp=drive_link&ouid=112085680278576554199&rtpof=true&sd=true

Appendix C

Google form link

https://forms.gle/Y7kyDuwpRbayjiVM8

Appendix D

Excel Extracted data for Analysis

https://docs.google.com/spreadsheets/d/1qfm9bWIim5EZ8nW3NPWiHB223IyJqIFR/edit?usp=drive_link&ouid=112085680278576554199&rtpof=true&sd=true

Appendix E

SPSS sheet

https://drive.google.com/file/d/1IKTxEi4K2iJUYSJqAEha5kr9buMiDGXO/view?usp=drive_link