Exploring Psychology Lecturers' Attitudes Towards Mobile Virtual Reality: Opportunities, Barriers, and Educational Potential

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Abstract

Virtual Reality has the capacity to facilitate novel and unique learning experiences for higher education students. Despite this, economic and accessibility challenges continue to limit its widespread adoption. This study explores psychology lecturers' attitudes towards cost-effective Mobile-VR. Sixteen psychology lecturers engaged with Mobile-VR headsets and participated in online focus groups. Using Constant Comparison and Micro-Interlocutor Analysis, five themes were generated: (a) Accessibility of Mobile Virtual Reality, (b) Embodied Learning, (c) Engagement, Reflection, and Classroom Collaboration, (d) Curriculum Integration, and (e) Barriers to the Adoption. Lecturers strongly supported Mobile-VR, recognising its ease of use and potential to enhance learning through immersive, embodied experiences, as well as fostering deeper understanding. However, financial constraints and the lack of high-quality 360° content pose significant barriers. The study highlights the need for institutional support, staff training, and bespoke content to better integrate Mobile-VR into the psychology curricula, enhancing the student experience.

Keywords: Virtual Reality; Higher Education; Psychology; Qualitative Methods; Attitudes

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Introduction

Advancements in technology since the early 2010s have significantly improved the feasibility of virtual reality (VR) for pedagogical use in higher education (HE). Lyne (2013) highlights the pivotal role of the Oculus Rift Development Kit, released in 2012, in facilitating the use of VR in education. Early implementations were primarily focused on medical and surgical fields, enabling students to practise procedural skills without risks to themselves or their patients. (Li *et al.,* 2017). Similarly, Hamilton *et al.* (2021b) highlight its use in fields such as engineering, mathematics, and biology to enhance student engagement with complex concepts. However, these applications primarily focus on procedural and technical learning objectives, with limited attention to VR's potential for fostering affective or interdisciplinary learning, particularly in psychology. Radianti *et al.* (2020) and Jensen and Konradsen (2018) emphasise VR's capacity to facilitate cognitive understanding, yet its adoption across disciplines remains uneven, leaving psychology lagging behind in integrating VR's unique potential for immersive and embodied learning.

While early predictions, such as those by Pantelidis (1993), suggested that VR could revolutionise education, its integration into HE has been slower and less comprehensive than anticipated. Despite its potential to transform how complex concepts are taught, significant barriers have limited its adoption across disciplines. Hamilton *et al.* (2021a) highlight financial costs, accessibility, and technological literacy as key obstacles, particularly for high-end VR systems that require substantial investment and technical expertise. These challenges have confined VR use to niche applications, rather than enabling widespread implementation across curricula. Furthermore, the focus on high-end systems overlooks the promise of more accessible alternatives, such as Mobile-VR, which could broaden the scope of VR adoption by addressing these barriers.

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VR in Higher Education

According to McIntyre *et al.* (2023), one of the primary advantages of VR is its capacity to facilitate the visualisation of abstract concepts in ways that traditional educational methods cannot. By doing so, students are afforded new perspectives that deepen their understanding of complex topics. In biology, for example, VR allows students to virtually shrink to the size of a human cell, allowing for the exploration of cellular structures and processes (Johnston *et al.,* 2018). Similarly, in health sciences, VR has been utilised to visualise complex systems like the cardiopulmonary system, the brain, and musculoskeletal biomechanics, offering students insights that are difficult to achieve through didactic methods (Hite *et al.,* 2022; Seo *et al.,* 2018).

VR's pedagogical value extends beyond cognitive and procedural learning by incorporating affective understanding through immersion, presence, and embodiment. Immersion, which enhances emotional engagement by absorbing learners into the virtual environment (Shin, 2018), and presence, the sensation of "being" in the virtual space (Slater *et al.,* 2022), work together to deepen the learning experience. Embodiment further strengthens this by synchronising physical movements with sensory feedback, creating seamless interactions between virtual and real worlds (Bertrand *et al.,* 2018). These qualities make VR uniquely suited for engaging students with emotionally complex topics. For instance, VR simulations that allow students 'step into the shoes' of someone with a mental health condition have been shown to enhance understanding and knowledge of such conditions (Formosa *et al.,* 2018; DePape *et al.,* 2020). In applied practice, such as nursing, VR has been shown to increase levels of sensitivity towards patients, illustrating its practical value in education (Campbell *et al.,* 2021). Indeed, such qualities have led VR to be coined the "ultimate empathy machine" – a term used by the technology's advocates as well as its detractors. Nevertheless, VR has been shown to play a significant role in promoting affective learning by enabling learners to emotionally and experientially connect with the subjects they are embodying.

Barriers to VR Adoption in Higher Education

Despite VR's well-documented educational benefits, its adoption in HE has been hindered by significant barriers. Hamilton *et al.* (2021a) identify prohibitive financial costs such as those for headsets, computers, and software licenses, as major obstacles. Chou and Hoisington (2018) similarly highlight VR's transformative possibilities but acknowledge that its implementation remains confined to isolated applications because of such impediments. However, much of the existing research has focused on high-end VR systems, often neglecting cost-effective alternatives like Mobile-VR, which could address these barriers and make adoption feasible across a wider range of disciplines.

In addition to financial barriers, technical challenges further complicate its adoption. Many educators, while enthusiastic about the potential of VR, struggle with the technical complexities of setting up and maintaining VR equipment (Ma, Wang, and Jiang, 2022). Issues such as connectivity problems, software glitches, and malfunctioning hardware are common, and without adequate technical support, these challenges can become insurmountable. The lack of technical expertise among educators also means that developing or sourcing appropriate VR content can be a daunting task (Al-Ansi *et al.,* 2023). Even when technical and financial barriers can be overcome, educators' concerns about their own self-efficacy and confidence in using VR technology can significantly hinder its implementation (Ma, Wang, and Jiang, 2022). Research indicates that many educators feel ill-equipped to effectively integrate VR into their teaching, often resulting in suboptimal or superficial uses of the technology (Fransson, Holmberg, and Westelius, 2020). This reluctance to embrace VR is compounded by the fact that many educators are already overwhelmed by existing teaching responsibilities, making it difficult to find the time and resources to learn and incorporate a new technology into their practice (Greener, 2018).

Given these barriers, there is a clear need for innovative approaches that can make VR more accessible and feasible for educational institutions. One promising option is

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the use of Mobile VR, which provides a cost-effective and technically simpler alternative to high-end VR systems.

The Mobile-VR Solution?

Mobile-VR presents a cost-effective and accessible alternative to high-end VR systems by utilising a user's own smartphone to deliver immersive content. Typically, Mobile-VR employs omnidirectional cameras to capture and project real-world scenes in a panoramic view (Pirker and Dengel, 2021). Users can view these 360° videos by attaching their smartphone to a simple headset, such as Google Cardboard, which uses the phone's inbuilt gyroscope to control the perspective by moving or tilting the head. Unlike high-end VR, which relies on computer-generated environments, 360° videos in Mobile-VR are often (but not always) grounded in real-world footage, offering a unique blend of reality and virtual experience (Alamäki *et al.,* 2021). This makes Mobile-VR a more practical and budget-friendly option for educational institutions. When comparing Mobile-VR to high-end systems, several key differences are apparent. High-end VR systems provide a higher level of interactivity, allowing users to manipulate and engage dynamically with the virtual environment through sophisticated controllers and tracking (Papachristos, Vrellis, and Mikropoulos, 2017). In contrast, Mobile-VR focuses more on observation and exploration within a predefined and structured environment, akin to being "on rails." The technological requirements for Mobile-VR are also significantly less demanding, making it more accessible to a broader audience (Chen, Chen, and Wang, 2023).

Despite the relative simplicity of Mobile-VR, researchers and practitioners have highlighted its potential benefits, particularly in education. A comprehensive review by Pirker and Dengel (2021) found that 360° videos offer substantial advantages in terms of accessibility, ease of content creation, and the ability to deliver immersive experiences. These benefits positively impact learning processes, enhancing performance, motivation, and pedagogical engagement. Consequently, Mobile-VR shows promise in delivering novel educational experiences in an accessible format.

Psychology Lecturers’ Attitudes Towards VR Adoption

The under-representation of psychology in pedagogical VR research is surprising, particularly given VR’s demonstrated potential for embodied learning in related fields. Research has shown that VR can facilitate immersive, embodied experiences, enabling learners to better understand complex psychological phenomena, such as the cognitive processes associated with mental health conditions like schizophrenia. Despite these promising findings in other disciplines, psychology has yet to fully embrace the integration of VR in its pedagogical practices.

To address this gap, it is essential to understand the attitudes of psychology lecturers towards Mobile-VR. Lecturers are the key drivers of technological integration within HE, and their perceptions play a crucial role in determining whether novel tools like VR are successfully incorporated (Lee and Shea, 2020). The Educational VR System Model proposed by Alfalah and colleagues (2017) highlights the need for mutual motivation and willingness among both lecturers and students for the effective implementation of VR in education. According to this model, lecturers' perceptions of VR, including their enthusiasm and willingness to use the technology, are pivotal to its successful adoption (Alfalah *et al.,* 2017; Alfalah, 2018).

However, many educators remain hesitant to adopt VR, particularly in disciplines like psychology, where technology has not traditionally been a central focus. Concerns about technical expertise and confidence in using the technology often result in reluctance or resistance (Shen *et al.,* 2019). Understanding psychology lecturers' attitudes towards Mobile-VR is therefore crucial to addressing these concerns and ensuring that the discipline can fully benefit from the educational potential of VR, particularly in fostering immersive and embodied learning. By focusing on these attitudes, this study aims to fill a critical gap in the literature and support the broader implementation of accessible VR technologies in psychology education.

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Aims and Objectives

In the context of psychological education, the application of VR has been notably limited, even though it could provide novel opportunities for enhanced visualisation and embodiment in teaching. Given these potential opportunities, this study aims to:

I. Explore psychology lecturers' perceptions of Mobile-VR headsets, particularly in terms of user self-efficacy, accessibility, and efficiency.

II. Assess whether Mobile-VR can mitigate the barriers associated with more costly, high-end VR systems.

III. Identify psychological domains and teaching activities where Mobile-VR could be effectively implemented.

IV. Understand how psychology lecturers perceive the impact of Mobile-VR on student learning and motivation.

Design and Methods

Participants

The present study recruited 16 psychology lecturers (seven male, nine female) from 11 separate HE institutions in the United Kingdom. A targeted convenience sampling strategy was employed using social media platforms, such as LinkedIn and Twitter, to recruit psychology lecturers. Posts included descriptions of the study, eligibility criteria, and a link to the Participant Information Sheet. This approach was selected due to its efficiency in reaching a specific professional demographic, which is essential in studies requiring niche groups (Thornton *et al.,* 2016).

Participants were required to be employed in a teaching capacity at a HE institution and have no previous experience delivering VR in an educational context. Personal experience with VR (e.g., through gaming or entertainment) was permitted. This restriction ensured that all focus group members had a similar level of experience

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with pedagogical VR, preventing those with prior experience from dominating the discussion and stifling the exchange of ideas.

The average age of participants was 34 years (*SD* = 8), with a range of 24 to 58 years. On average, participants had five years (*SD* = 4) of teaching experience in a HE capacity. There were eight focus group members (50%) had previous experience with VR technology, primarily for gaming purposes, with one for entertainment and films, and one for research.

Ethical Considerations

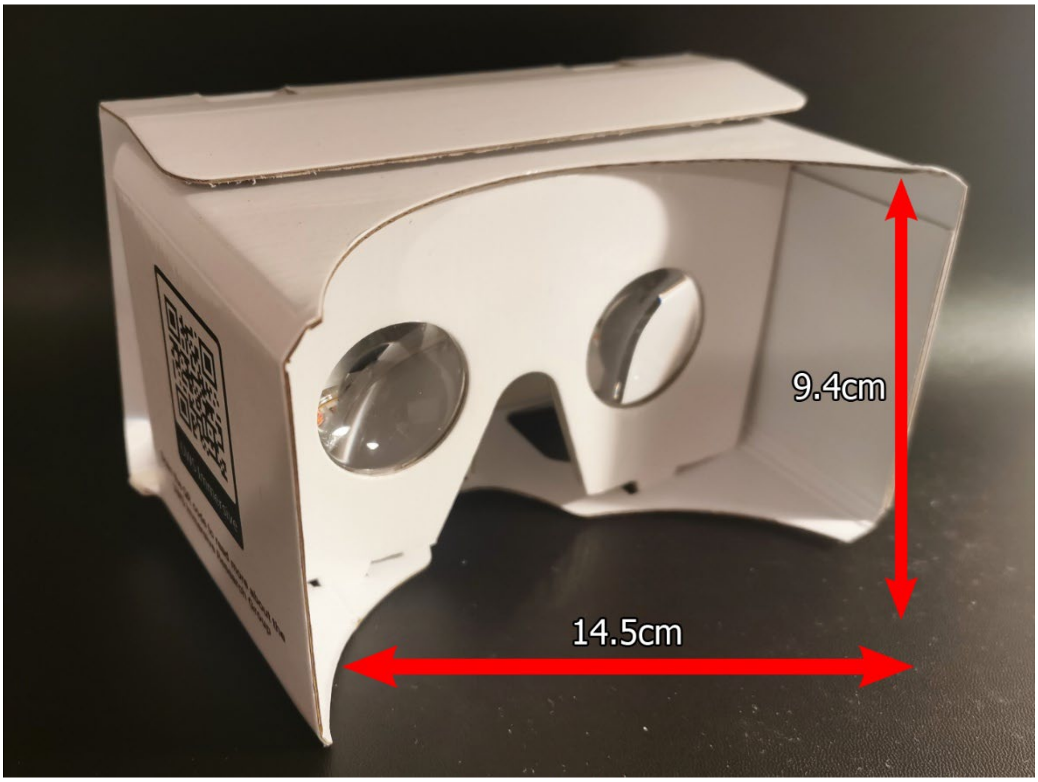
Ethical approval for the study was granted by the Departmental Ethics Committee at the host institution. Social media advertisements contained a link to an online Participant Information Sheet detailing the study's purpose and procedures. It also highlighted important procedural and ethical information that might influence participation. For example, prospective participants were informed that they must have their cameras switched on throughout the focus group session due to the method of analysis being used (Micro-interlocutor Analysis). This information was reiterated when completing the online Consent Form. Participants were permitted to change how their name appeared on the Zoom call (if they did not want to use their real name), and instructions on how to do this were included with the onboarding information.

Procedure

Mobile-VR Headset

Approximately two weeks prior to the online focus group, participants were sent a Mobile-VR headset in the post. The MaxBox 3.1. allows for participants to view 360° material by inserting their own smartphone into the compartment at the front of the headset. A photograph of the headset can be seen in Figure 1. In addition, participants received detailed onboarding instructions with their Mobile-VR headsets, including step-by-step guidance on setup and access to the mandatory VR content. To address potential technical issues, an FAQ document and a support email were provided. This ensured all participants were prepared to engage with the VR experiences effectively

Figure 1. MaxBox v.3.1. Headset



VR Example Experiences

Participants were sent links to four mandatory 360° to view before the focus group. These VR experiences relate to four domains of psychology: clinical, forensic, environmental, and developmental. The suitability of each 360° experience was discussed and approved by the principal researcher and three additional psychology

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lecturers. Discussions centred on three key criteria: (a) whether the experience was of acceptable quality (i.e., resolution and graphics); (b) whether the video presented an accurate experience of what it purported to represent (validity); and (c) whether the experience would be of educational interest and value to psychology lecturers. See Table 1 below for a full list of experiences.

In addition to the mandatory 360° experiences, participants were also encouraged to explore additional content independently, with links to common VR applications such as Within, and Google Expeditions, provided. The timeline can be found in Figure 2 on the following page.

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Table 1: List of VR experiences given to participants

Title	Domain	Length	Description
Autism TMI Simulation	Clinical Psychology	2:06	Simulates sensory overload in a child with autism in a busy shopping mall with distorted visuals and sound.
A Walk Through Dementia – Walking Home	Clinical/Ageing Psychology	3:20	Provides a first-hand experience of dementia, showcasing confusion, disorientation, and visual disturbances.
6x9: An Experience of Solitary Confinement	Environmental and Forensic Psychology	2:50	Computer-generated view of a solitary confinement cell, highlighting the psychological impact and reasons for confinement.
First Impressions: A Virtual Experience of the First Year of Life	Child Development	5:37	Narrated experience from a newborn’s perspective, showing changes in perception and the effects of childhood neglect.

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Data Collection and Transcription

After two-weeks of interaction with the Mobile-VR headset, participants took part in an hour-long online focus group conducted via Zoom. In total, four focus groups were conducted, with each group having between three to five members. This adheres to the recommendations for synchronous online discussions proposed by Abrams and Gaiser (2017). Smaller group sizes were deemed acceptable due to the professional background of participants, who tend to contribute more openly to peer discussions (Finch and Lewis, 2003). A 'sequential round-robin' approach was used to promote inclusivity, with each participant invited to respond to initial questions in turn before moving into open discussion. This ensured that all group members had the opportunity to contribute to every question, preventing the discussion from being dominated by a few individuals.

The interview schedule for the focus groups was designed to explore psychology lecturers' attitudes and perceptions towards Mobile-VR technology, ensuring that the discussion was both structured but flexible. Initially, questions focused on the usability and navigability of the headsets, aiming to assess whether Mobile-VR could be a more accessible alternative to high-end systems. Following this, open-ended questions were then asked to explore both the educational utility of the VR experiences and potential barriers to their adoption. This structure allowed for a comprehensive exploration of both opportunities and challenges (see, Appendix 1 for a full list of questions and prompts).

Each focus group was visually and auditorily recorded to assist with later transcription and analysis. Each participant was given a pseudonym, and the focus group was transcribed verbatim. Upon completion of the transcripts, they were imported to NVivo 12 for analysis.

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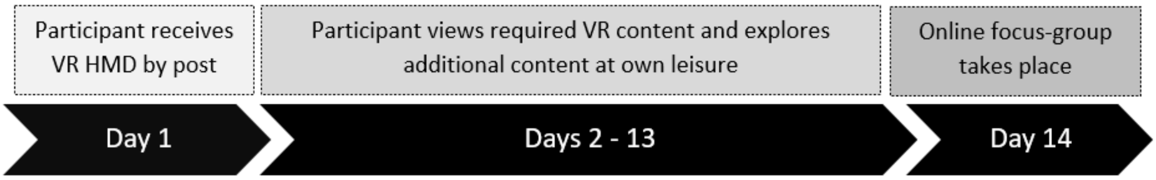
Figure 2. Timeline for study



Methods of Analysis

The present study utilised a combination of Constant Comparison Analysis (CCA) and Micro-Interlocutor Analysis (MIA) to achieve a nuanced understanding of participants' attitudes and perceptions towards the use of virtual reality (VR) in higher education teaching.

Constant Comparison Analysis

Constant Comparison Analysis (CCA) has its roots in grounded theory and is widely used in the analysis of focus group data (Leech and Onwuegbuzie, 2011). The CCA process involves three stages: open coding, axial coding, and selective coding (Doody, Slevin, and Taggart, 2013). An illustrated example of this process can be found in Figure 3.

A hybrid thematic framework was used, integrating deductive themes from prior research with inductive analysis to explore data without preconceived frameworks (see, Nili, Tate, and Johnstone, 2017). This dual approach ensured a thorough and flexible analysis, capturing both expected and novel insights. The lead researcher initially generated the codes and identified early themes. These preliminary codes and themes were then reviewed by three co-authors, who offered feedback and suggestions to ensure alignment with the proposed themes and the broader dataset. In a final meeting, all four researchers collaboratively refined, reorganised, and,

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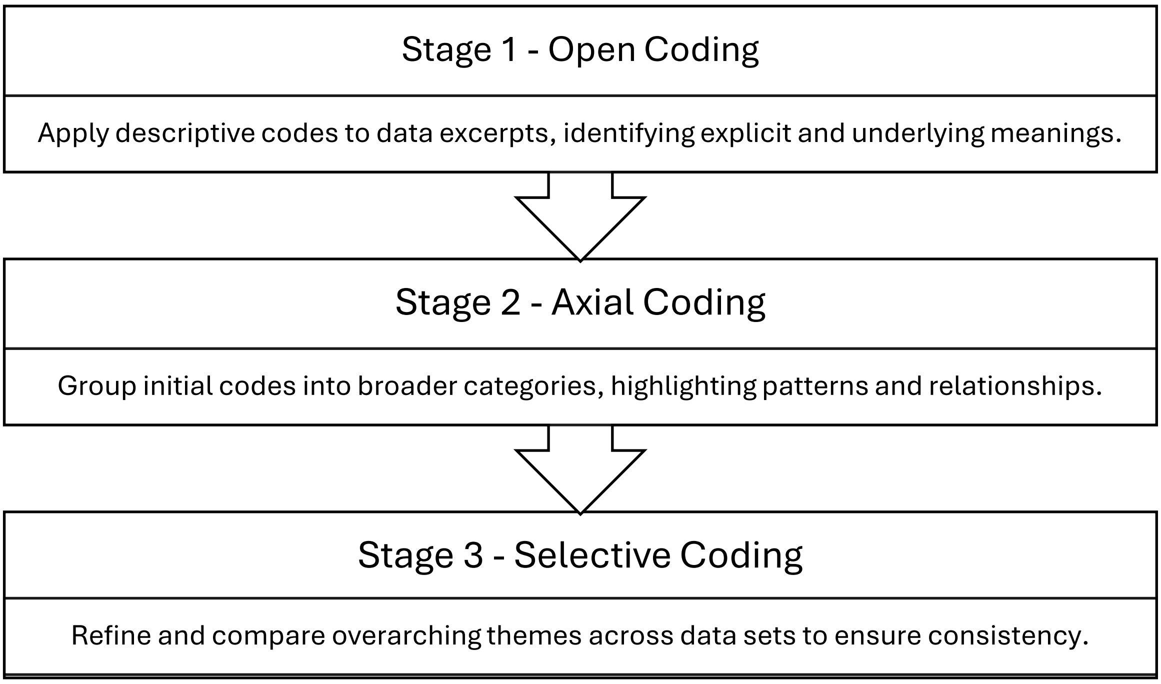
when necessary, discarded themes. This process continued until consensus was reached, resulting in the establishment of five overarching themes and their corresponding quotations. To support full transparency in theme generation, an illustrated coding map can be found in Appendix 2.

Figure 3. Stages for Constant Comparison Analysis (CCA)



Micro-Interlocutor Analysis

Micro-interlocutor Analysis (MIA) is a novel method for focus group analysis developed by Onwuegbuzie *et al.* (2009). MIA is based on the notion that analysing only the focus group as a whole often overlooks important information expressed by individual participants, particularly the extent of agreement or disagreement regarding key points or ideas. Consequently, vague quantitative statements like "the majority agreed that…" or "only a minority disagreed with…" are frequently used to express consensus (Sechrest and Sidani, 1995). MIA evaluates participants' verbal responses (e.g., "Yes," "No," or detailed example statements), lexical utterances (e.g., "Uh-um," "Hmm"), and body language (e.g., nodding or shaking the head) to determine the degree of consensus or dissent (Onwuegbuzie *et al.,* 2009; 2010).

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As online focus groups were both auditorily *and* visually recorded, participants' verbal and non-verbal cues could be evaluated for consensus and dissent (see Table 2 for an overview of the coding structure used). By considering both units of analysis (i.e., the group *and* the individual) CCA and MIA allowed for a comprehensive investigation that balanced the identification of common themes with the recognition of individual contributions. This dual-method approach facilitated a deeper understanding of the collective and individual attitudes towards VR in education.

Table 2. MIA coding and description for participant responses

Response	Code	Description
Agreement/Consensus	A	Participant indicated agreement with the premise based upon a nonverbal (e.g. nodding) or short verbal (e.g. "yes," "I agree") response.
	SA	Significant agreement or consensus. Participant agreed with the premise and provided an anecdote, significant statement, or concrete example to highlight.
Disagreement/Dissent	D	Participant indicated disagreement with the premise or component based upon a nonverbal (e.g. shaking head) or short verbal (e.g. "I disagree") response.
	SD	Significant disagreement or dissent. Participant disagreed with the premise and provided an anecdote, significant statement, or concrete example to highlight.
No-response	NR	Participant did not provide a verbal or non-verbal response, indicating neither agreement nor disagreement.

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Findings and Discussion

By utilising constant comparison analysis, five overarching themes were formulated that were consistent across all four focus groups. These were: (a) accessibility of Mobile-VR, (b) embodied learning, (c) engagement, reflection, and classroom collaboration, (d) curriculum integration, and (e) barriers to adoption.

Theme A: Accessibility of Mobile-VR

High-end VR headsets often require significant technical proficiency, and previous studies have found that educators frequently lack the training or time needed to develop these skills. Therefore, this study used a low-cost, accessible Mobile-VR headset to see if psychology lecturers could integrate the technology into their teaching. This theme explores perceptions towards the Mobile-VR hardware itself.

The most prominent attitude across groups was Mobile-VR's ease of use. This included the straightforward assembly of the headset and the simplicity of navigating to and accessing 360° content. When asked about the ease of assembling the Mobile-VR headset, 81% of lecturers agreed it was simple, requiring minimal effort. Only one participant disagreed, citing poor eyesight (a full overview can be found in Table 3 at the end of this section). Overall, the consensus was overwhelmingly positive regarding ease of assembly:

> "I thought it was really good. And the fact that it comes flat-packed and goes through the letterbox seems really accessible. And when I looked at the instructions it was easy enough to build up and my phone seems to work pretty well with it." *Nicole*

Lecturers found Mobile-VR headsets quick to set up and user-friendly, leveraging existing smartphone technology, which would simplify classroom integration:

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> "In terms of the kit, I like the fact that it was easy to set up. And the fact that it was using tech that most folk already have, so it's using their mobile phones. I can see how that's going to be so helpful with regards to the practicalities of using it." *Eilidh*

Lecturers observed that Mobile-VR was highly user-friendly, with no need for additional application or interface learning. Manis and Choi (2019) have established that perceived ease of use is a key predictor of users' willingness to adopt VR in future practical applications. Feedback from lecturers with experience using high-end systems further highlighted that the Mobile-VR headset was more user-friendly, accessible, and simpler to calibrate:

> "I bought my [partner] a good quality headset a few years ago, and that took ages to set the focus and make sure it was working properly. But this one worked immediately […] I really couldn't have been more impressed with the quality of it. I was surprised." *Kirsty*

Previous studies have identified second-order barriers, such as self-efficacy and technological apprehension as being a significant barrier in pedagogical VR adoption (Cooper *et al.,* 2019; Fransson, Holmberg, and Westelius, 2020). However, despite all lecturers in this study being new to educational Mobile-VR, there was little apprehension regarding the hardware's ease of use. This suggests that Mobile-VR may alleviate many technical barriers associated with high-end systems, making it a suitable entry-level system for classroom integration.

Lecturers not only identified the affordances of an accessible Mobile-VR system in abstract terms but also provided examples of how this accessibility translates to practice. A recurring view across all focus groups was that Mobile-VR could be used as a teaching tool in distance and/or asynchronous learning. Unlike high-end systems, lecturers noted that a Mobile-VR headset could be posted to a student's residence, allowing access to material from home. This is not an option with high-end VR systems. Consequently, Mobile-VR may allow psychology lecturers to equip their students with immersive content regardless of whether a blended, distance, or

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hybrid learning approach is used. This flexibility would be difficult to replicate without the accessible nature of Mobile-VR technology.

Theme B: Embodied Learning

Participants across groups were enthused about using Mobile-VR for embodied learning. Participants noted VR's unique capacity to simulate the experiences of other people, enhancing student learning by embodying different psychological states or temperaments:

> "I think VR would be useful in letting people step into other people's shoes. It gives students a chance to experience different ways of thinking." *Martin*

This aligns with theories of embodiment proposed by Slater *et al.* (2022), which suggest that VR can create a sense of ownership over a virtual avatar distinct from the user's identity. Indeed, this phenomenon has been well substantiated across numerous diverse experiences and domains (e.g., Banakou, Groten, and Slater, 2013; Seinfeld *et al.,* 2018). Psychology educators in the study supported this notion, seeing VR as a tool to convey significant psychological and sensory differences through body ownership. This ability to bridge diverse experiences underscores its potential to foster understanding and empathy, contributing significantly to discussions on embodiment and identity in virtual environments:

> "Experiencing what other people experience and putting yourself into the position of someone as a tool to make students reflect […] this is an area where I would like to see VR used." *Kevin*

Most participants (81%) viewed Mobile-VR positively as a tool for embodied learning, with many expressing a desire to incorporate it into their teaching. They highlighted its potential to offer educational insights through direct embodied representation, particularly in understanding the emotional or mental states of others. Participants were able to provide a range of examples of where VR could be used in mental health education. They believed that embodying someone with a mental health

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condition (e.g., anxiety, dementia) could deepen students' understanding beyond conventional teaching methods:

> "I always try to make sure that whatever condition I'm teaching, the class watch some videos on YouTube, or we read some testimonials from people to see what it's like to live with each of these conditions. And actually, I think something like VR would be one step better than that." *Eilidh*

Psychology lecturers widely regard Mobile-VR as a powerful tool for enhancing students' theoretical understanding of mental health conditions. This perspective is rooted in the belief that VR can bridge theoretical concepts with tangible, embodied experiences, thereby solidifying learning. Empirical studies reinforce this viewpoint, particularly in the realm of mental health education. For example, Adefila *et al.* (2016) demonstrated that a dementia VR experience significantly enhanced participants' knowledge, understanding, and application of behavioural approaches. Furthermore, VR has been used to simulate a wide range of conditions to facilitate a deeper understanding of the lived experiences of those affected. For instance, Lee, Kim, and Eom (2020) introduced a VR simulation using 360-degree video to train nursing students in schizophrenia care. This approach allowed students to engage with the subject matter in ways that traditional clinical placements often cannot. Formosa *et al.* (2018) further supports this with a study on the efficacy of a VR simulation to enhance understanding of schizophrenia and psychosis symptoms. Participants, including psychology students and the public, exhibited significant improvements in their understanding, empathy, and attitudes towards schizophrenia after experiencing a VR simulation of a psychotic episode. Collectively, these studies demonstrate that psychology lecturers' positive attitudes towards VR are backed by a body of empirical findings. VR has been shown to enhance understanding, empathy, and applied knowledge, not only of mental health conditions but also of other significant life-impacting experiences, making it a potentially invaluable pedagogical tool in psychological education.

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Theme C: Engagement, Reflection, and Classroom Collaboration

Lecturers expressed optimism about the potential of Mobile-VR to significantly enhance motivation and classroom engagement. They emphasised that motivation, which drives goal-oriented behaviour, is crucial for learning, as it influences learners' effort, persistence, and emotional connection to the task (Ratner, 2014). According to the lecturers, Mobile-VR, as an enjoyable and stimulating learning medium, could spark students' curiosity and increase their motivation to engage with the subject matter. Erin, highlighted this potential:

> "I do think that there's something to be said for making sessions more engaging and enjoyable. If you can buy them (students) into the session with something like Mobile-VR, then obviously it is going to help them. I think this could be a really cool way of doing that." *Erin*

This sentiment was echoed by 69% of lecturers, who suggested that Mobile-VR could increase motivation in learning psychology. This aligns with prior research that has shown the effectiveness of integrating technology, including VR, in enhancing student motivation and academic attainment (Serin, 2020; Lee and Shea, 2020). Furthermore, Goksu and Islam Bolat (2021) stress the importance of pedagogical relevance and satisfaction in fostering engagement, both of which are achievable through well-designed Mobile-VR experiences.

However, lecturers also emphasised that the engagement and motivation generated by Mobile-VR should not be seen as an end in itself, but as a means to create classroom collaboration and deeper learning opportunities. Beyond the initial engagement, they believed that Mobile-VR could facilitate more nuanced understandings of theories and concepts through peer learning and classroom discussions. Over half of the participants (56%) explicitly mentioned the importance of combining Mobile-VR experiences with subsequent discussions to maximise learning outcomes. Mandy illustrated this approach:

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> "I think VR should be used at the beginning of a seminar or workshop. Then it would be followed by taking the VR headset off, and then having an in-depth discussion about how everyone experienced the situation, and how this relates to the content in the lecture." *Mandy*

This method allows students to engage in reflective and collaborative learning, where they share their insights and perspectives from the Mobile-VR experience with their peers. For example, Olivia noted the potential for peer discussions to deepen understanding:

> "You can get students to watch something like a forensic psychology experience and then discuss it in their groups. They'd say, 'oh, I didn't see that, did you?' Or, 'that was not what I took away from the experience'. I think it would be really effective." *Olivia*

Lecturers believed that Mobile-VR could provide novel insights that would serve as a basis for wider discussion. This embodied learning component, where students actively engage with and reflect on the material, can be enriched through collaborative activities, such as small group discussions or breakout rooms. These interactions, fuelled by the engaging nature of VR, help create a dynamic learning environment where students are motivated to learn from each other. This approach differs from the traditional view of VR as a solitary activity, offering instead a collaborative and socially interactive classroom opportunity. As previous research has shown, collaborative learning can effectively enhance both motivation and conceptual understanding (Laal and Ghodsi, 2012). Lecturers in this study saw Mobile-VR not only as a tool for engagement but also as a catalyst for deeper, collaborative learning experiences. This is a novel insight in psychology education, where the focus often remains on real-time interactions within virtual environments. By encouraging interaction after the VR experience, lecturers can foster a learning environment where engagement and motivation translate into meaningful classroom collaboration.

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Theme D: Curriculum Integration

According to Southgate and Smith (2017), previous VR research has often neglected to consider how the technology can be practically applied within a wider curriculum. Therefore, it was important for this study to consider how psychology lecturers evaluated VR's place within their modules. Participants were almost unanimous that Mobile-VR should be used as a supplementary and complementary part of the learning experience, and not as a replacement for conventional teaching methods:

> "It must be supplementary. As I said before, it would just be used to provide a general experience. And then the teaching will come in about evidence-based practice, and theory, and that sort of thing. So, I can only ever see it being supplementary rather than a replacement." *Mark*

MIA identified that 75% of focus group members explicitly mentioned that they envisage Mobile-VR as a supplementary method of education rather than a replacement for traditional methods. There were no significant dissenting statements. Mobile-VR is seen as one tool among many that can be utilised alongside traditional educational methods. Lecturers expressed that they did not see Mobile-VR as necessarily superior or in competition with traditional forms of teaching, but rather as a tool that can be amalgamated with them.

Psychology lecturers view Mobile-VR as part of a broader multimodal learning strategy, which integrates various didactic, visual, auditory, and technological tools to enhance the learning experience (Yelland, 2018). Reflecting the perspectives found in this study, Yelland (2018) highlighted that digital technologies are often seen as complementary to traditional teaching methods, rather than as replacements or competitors to them.

Although there has been little qualitative research examining the attitudes of HE lecturers towards Mobile-VR module integration (Southgate and Smith, 2017), the current study makes a significant contribution to the existing body of literature examining VR's pedagogical role. Previous research has supported VR's role as a supplementary tool (Fransson, Holmberg, and Westelius, 2020), but primarily within primary education, not universities. Given the distinct practicalities of delivering HE, it is reasonable to assert that the holistic view of VR integration across disciplines and institutions is that it is best used as a complement to conventional teaching, not as a replacement. This study represents the first time this has been substantiated in HE psychology lecturers using Mobile-VR.

Although psychology lecturers view Mobile-VR as a supplementary tool, the question of when it should be used remains. The overarching attitude was that VR must be integrated with purpose, with a specific and predefined learning goal in mind:

> "I don't think it should be that every class is going to use VR, because that's not the point of it. We should only be using it if there's a real need and there's going to be some kind of educational benefit. So, it is something that I'm going to think about using […] but it would need to be in very specific circumstances and for a specific reason." *Erin*

The choice to use Mobile-VR must be driven by the learning outcome or goal being pursued (see, Picciano, 2009). It is important that the desire to use Mobile-VR does not dictate the learning objectives. Appropriate implementation requires psychology lecturers to predefine their pedagogical objectives before adopting VR in the classroom. This pre-emptive planning will allow them to identify topics or concepts that may be better understood or facilitated using Mobile-VR. By doing so, the purposeful integration of Mobile-VR has the potential to engage students by providing unique insights into psychological phenomena.

Theme F: Barriers to Adoption

Barriers to adoption refer to the practical impediments that lecturers envisaged if they were to attempt to integrate Mobile-VR into teaching. A range of barriers were identified that can generally be broken down into two main sub-themes: (1) financial barriers; and (2) content barriers.

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Subtheme 1: Financial Barriers

Financial barriers are those impediments that are primarily the result of a perceived lack of institutional support for Mobile-VR funding. The most common concern centred on the financial investment necessary to buy the requisite number of headsets and associated equipment. This was despite all lecturers being explicitly told of the relatively low cost of the Mobile-VR headset prior to being asked about potential barriers:

> "I guess finance would be my first probably - my first most obvious one, I guess. Trying to evidence that this would be a significant addition to students experience and things like that, I think, would be difficult." *Mandy*

Despite the comparatively low cost of the Mobile-VR headset, MIA revealed that only one lecturer made a significant dissenting statement regarding poor institutional support. Kevin remarked that the "teaching focused" nature of his own institution meant that he felt confident that a future Mobile-VR teaching project would be readily funded by management. However, clearly this is not the prevailing attitude among psychology lecturers in the current study. Most lecturers (69%) explicitly expressed doubt that their institution would readily support the possibility of Mobile-VR learning with an initial financial injection. This was a surprising finding as it was reasoned that the introduction of a low-cost VR solution would alleviate some of the financial pressures associated with the funding of high-end systems. However, cost remained a central concern. Although the individual unit price of Mobile-VR is comparatively small, a minimum bulk order is typically needed to secure enough headsets for an entire class. This large initial cost appears to be the major stumbling block. As one participant noted:

> "I think my biggest practicality would, would still be cost. I think if I said to my director of teaching, I want to spend £700 on this, I think she'd say no." *Erin*

The above excerpts exemplify that some lecturers already have a preconceived attitude that financial support will not be available for any Mobile-VR teaching.

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Therefore, some lecturers may not feel confident or motivated enough to approach their institution in the first place to request or enquire about access to funding. As Tondeur *et al.* (2017) concludes, pedagogical innovation is centred on institutions having policies that incentivise novel technological approaches to teaching. It is therefore paramount that departments and institutions take the initiative to encourage their staff to pursue Mobile-VR teaching in psychology if this is felt to be beneficial to students. And part of this support will undoubtedly need to consist of financial support in the form of applications and grants to acquire headsets. Despite close to a decade of pedagogical VR research and application, associated costs remain one of, if not the most important impediments to widespread adoption.

Subtheme 2: Content Barriers

Psychology lecturers, after a two-week trial with the Mobile-VR headset, identified a significant barrier that could hinder its implementation: the scarcity of high-quality, suitable 360° content. They also expressed doubts about the feasibility of creating bespoke content due to the technical skills required.

Participants were given links to free 360° content relevant to psychology education and encouraged to seek out content independently. Although they saw the potential of Mobile-VR for embodied learning, they found the lack of suitable content problematic for their teaching. Many available 360° videos were deemed of poor quality and unsuitable for classroom use. For instance, lecturers critiqued the Autism TMI Simulation video for its intense and exaggerated portrayal of autism:

> "I think the autism video was a very intense representation of the condition. Autism affects people in different ways. But every single thing someone with autism can experience was put into that one experience." *Olivia*

Lecturers also struggled to find content that met their specific teaching needs, especially for advanced modules. They anticipated difficulties in sourcing appropriate material:

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> "I do a lot of teaching on third- and fourth-year modules. And when you get to that stage, we are looking at very specialised areas. I found it really difficult to find specific things that actually met my requirements." *Mandy*

The lack of appropriate content remains a significant barrier to VR integration. Using low-quality 360° videos because they are somewhat relevant contradicts Picciano's principle of integrating "with purpose" (Picciano, 2009, p. 7). Lecturers in this study emphasised that lessons should not be shaped to fit a specific 360° video. They suggested that creating bespoke psychological content adhering to the curriculum is the best solution, though this requires time to develop the necessary skills. To address this, universities should encourage cross-departmental collaboration to develop high-quality 360° content. For example, psychology departments could partner with computer science, animation, or creative filmmaking faculties. Technically, creating material for Mobile-VR headsets is simpler than for high-end VR systems, as 360° content can be easily uploaded to platforms like YouTube or Vimeo without digital certificates or application signing.

Ultimately, the immediate lack of appropriate content is a major barrier to Mobile-VR integration in HE psychology. However, a holistic approach to integration, including prior planning and cross-departmental cooperation, can help determine whether suitable content exists or needs to be created.

Conclusion

This study assessed the attitudes of psychology lecturers towards integrating Mobile-VR in their classes. Focus group discussions with psychology lecturers generated five overarching themes: (a) accessibility of Mobile-VR, (b) embodied learning, (c) engagement, reflection, and classroom collaboration, (d) curriculum integration, and (e) barriers to adoption.

Lecturers identified Mobile-VR's potential to deliver embodied learning as particularly suited to psychology education. They believed that taking the perspective of another

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person, especially within clinical or mental health psychology, could give students unprecedented insight into the lived experiences of others. They hoped that this would increase student motivation and facilitate in-depth classroom discussions. These discussions would allow students to share insights and perspectives based on shared Mobile-VR experiences, supplementing traditional teaching methods and materials.

Despite enthusiasm for Mobile-VR's ease of use, several barriers were identified. The relatively low unit cost still posed a significant financial barrier due to the initial investment required. Many lecturers were apprehensive about seeking funding from their institutions, assuming that financial support would not be forthcoming. Additionally, the reliance on pre-made 360° content was seen as a major issue. There is a need for bespoke material tailored to individual teaching needs.

A potential limitation is the short duration in which lecturers interacted with the VR headset before the focus groups. Given their inexperience with VR in education, this may not have been enough time to develop fully informed attitudes and perspectives. They might not have explored additional material beyond what was initially prescribed. However, longer exploration periods were not feasible for full-time lecturers with existing responsibilities. Another limitation is the variability in the types of mobile smartphones used by participants. Differences in screen size, resolution, processor, and speakers could have influenced attitudes towards Mobile-VR and its educational utility. However, these differing experiences represent a naturalistic and ecologically valid application of applied Mobile-VR use. Ultimately, in the classroom, staff and students will interact engage with the technology using their own devices which will naturally result in a divergence of experience.

Finally, there was no formal mechanism to ensure that participants engaged with all recommended 360° clips prior to the focus group session (although it was hoped that the two-week period would allow sufficient time to do so). This may have led to varying levels of engagement, potentially limiting the depth and breadth of insights shared during discussions. Future research could address this limitation by incorporating data-triangulation techniques, such as participant diaries or

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engagement logs, to track the specific content viewed. These methods would not only provide clear evidence of engagement but also enable more tailored and focused discussions based on individual interests and independently sourced material.

Overall, this research provides insights into psychology lecturers' attitudes towards Mobile-VR for education. Lecturers were positive about its potential, suggesting that embodied learning could supplement traditional theoretical understanding. Mobile-VR was seen as a user-friendly and accessible way to deliver immersive technology to students. However, financial feasibility and the availability of appropriate 360° content remain significant barriers. Addressing these issues will be crucial for successfully integrating Mobile-VR in higher education psychology classrooms.

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Table 3: MIA participant responses

	Focus Group 1					**Focus Group 2**			**Focus Group 3**					**Focus Group 4**			**Overall Agreement (%)**
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	
Finances barriers still pose a problem	NR	NR	NR	A	NR	A	A	A	A	NR	A	SD	NR	A	A	A	69%
Mobile-VR useful for embodied learning	A	A	NR	NR	A	A	A	A	A	A	A	A	A	A	A	NR	81%
It is easy to assemble Mobile-VR headset	SA	NR	NR	A	A	SA	A	A	A	A	A	A	D	A	A	A	81%
Mobile-VR would motivate and engage students in the classroom	NR	NR	A	NR	A	NR	SA	A	NR	A	SA	SA	SA	A	A	A	69%
Mobile-VR is best used as a supplementary method of education	SA	A	SA	SA	SA	A	SA	A	A	SA	NR	A	NR	NR	A	NR	75%
Mobile-VR can facilitate classroom discussions	A	NR	NR	A	SA	SA	A	A	A	A	NR	NR	NR	NR	NR	A	56%

Note: See Table 2 for a full overview of the codes used for MIA.

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Appendix 1

Introduction

General introduction, including a brief description of the focus group format. Facilitator introduces themselves and allows each participant to introduce themselves.

Discussion Stage

1. Mobile-VR HMDs:
   - What are your thoughts on the mobile-VR HMDs?
2. VR Experiences:
   - What did you think of the specific VR experiences that you were asked to watch?
3. Teaching Practices:
   - Would you consider using any of the VR experiences in your current teaching practices?
4. Integration into Teaching:
   - How would you integrate these experiences into your teaching?
5. Evaluating Learning Outcomes:
   - How could the learning outcomes associated with these experiences be evaluated (e.g., exam scores, group discussions, essays, module evaluations)?
6. Advantages of Mobile-VR:
   - Based on your experience, do you think mobile-VR provides any advantages over other teaching methods for these topics?
7. Additional Content and Implementation:
   - What other VR content did you discover, and how could it be implemented into psychology education? What other uses could VR have?
8. Navigation of HMD:
   - How easy or difficult was it to navigate the HMD?
9. Facilitators and Barriers:
   - What facilitators or barriers do you foresee with mobile-VR implementation?

Closing Remarks

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Appendix 2

Codes	Theme	Relationships/Notes
Positive about Mobile-VR Good build quality One for every student Can be used at home COVID-19 use Accessible to everyone Easy to use Easy to access content Good visual quality	**Accessibility of Mobile-VR**	*Positive about HMD and the ease of content access*
Embodied learning Constructivism Behaviour change VR to teach mental health VR to teach theory Virtual field trips Step into shoes Empathy	**Embodied Learning**	*Experiential learning* *Embodiment* *Presence* *Immersion*
Increased motivation Increased engagement Better attendance Enjoyment in class Novelty effect Facilitates discussion Better recall of information Better learning VR for revision	**Engagement, Reflection, and Classroom Collaboration**	*Theories of motivation and engagement*
Multi-modal learning Blended with purpose Supplementary method Optional extra Introductory tool Small classes Seminars Not lectures Use from home	**Curriculum Integration**	*Pedagogical learning theories*
Cybersickness Poor content Need bespoke content Too time-consuming Need training Financial barriers Needs bespoke content	**Barriers to Adoption**	*First and second-order barriers*

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