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Immersive Mindfulness: Adolescents' Meditation Experiences in Maloka VR

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Abstract. Virtual Reality (VR) meditation offers promising solutions to address declining attention spans and enhance cognitive functioning in adolescents. This study evaluates the effectiveness of immersive VR interventions in improving adolescents' ability to focus their attention. Using the Maloka VR application, participants demonstrated increased focus, engagement, and relaxation after brief meditation sessions. The immersive meditation experience facilitated mindfulness and body awareness, which are essential components for enhancing focus, particularly for individuals with attention-deficit hyperactivity disorder (ADHD). Importantly, findings from this study will inform the development of scalable, school-based VR meditation programs designed to support student well-being, attention training, and self-regulation. By integrating VR meditation into existing wellness initiatives—such as Zen rooms and mental health programming—schools can offer innovative tools to help students manage stress, improve focus, and prepare for cognitively demanding tasks. Future research should explore long-term effects, optimal implementation strategies, and inclusive design principles to ensure equitable access to VR meditation interventions across diverse educational settings.

Keywords: Immersive Learning, Learning Strategies, Inclusive Design, Training Attention, Generative AI, Mindfulness, Virtual Reality Meditation.

1 Introduction and Relevance

The modern classroom faces a critical challenge with students' diminishing attention spans, mainly due to digital distractions and repetitive or passive teaching methods that lead to inattentiveness [1]. When students struggle to focus, their engagement with curriculum content diminishes, leading to reduced comprehension, incomplete learning, and lower academic performance. To address this problem, educators can implement interactive teaching strategies that integrate multisensory engagement, including shorter lesson segments, visual aids, and delivery techniques that capture and maintain students' attention. By aligning instructional approaches to engage students' cognition, teachers can foster deeper information processing and personally responsive learning environments that help adolescents learn despite their attention span challenges [2].

In today's world of digital overstimulation, adolescents' ability to focus faces significant challenges, impacting their learning progress and productivity [3]. Virtual Reality (VR) meditation and immersive learning techniques have emerged as innovative solutions for enhancing cognitive functioning by facilitating mindfulness, reducing stress, and addressing attention deficits in a controlled and engaging setting [4]. VR-based interventions offer multisensory and adaptive experiences that provide immediate feedback, allowing students to develop sustained focus. This study examines adolescents' learning experiences with Maloka VR, an immersive meditation, reflection, healing, and play platform. According to its founders, Sukey and Elizabeth Novogratz, Maloka VR is powered by three core elements—Life, Spirit, and the Universe—with the objective of helping to "spark your path towards a life filled with more joy, more love and more shine" [5]. By integrating VR meditation and immersive learning, this research highlights new opportunities for cognitive development and offers targeted solutions for addressing declining attention spans in adolescents.

2 Training Adolescents' Attention and Focus Through VR Meditation

Adolescence is a critical developmental stage during which young people become increasingly aware of the challenges they face, including broken homes, discrimination, and poverty, which can make life feel overwhelming. Following the COVID-19 pandemic, educators observed a rise in mental health issues, particularly anxiety and depression, which have negatively affected adolescents' success in various aspects of life by impairing their neurocognitive abilities, especially concentration and attention span [6]. Meditation is well known for its ability to promote mindfulness, improve emotional regulation, and enhance focus in children [7]. VR technologies and applications have emerged as powerful educational resources that can engage students in digital media literacy experiences [8, 9]. However, there remains a significant gap in understanding how VR meditation specifically impacts adolescents' attention and focus.

This study aimed to assess the effectiveness of VR meditation in enhancing mental health awareness and cognitive focus among adolescents in today's fast-paced and distraction-heavy classroom environments [10]. Participants (n=11) aged 13 to 17 from Humboldt, Saskatchewan, Canada, participated in five VR meditation sessions using the Maloka VR application on the Meta Quest 2 head-mounted display (HMD). Each session lasted two hours, and the study was conducted over the span of one week. The participants followed a set agenda, beginning with an introduction to meditation without the HMD. By the third day, participants were using the HMD. Throughout the sessions, qualitative and quantitative data was collected through concentration activities, (e.g., word searches and Sudoku), instructor observation, pre- and post-surveys, and in-depth interviews. Maloka VR [5] was chosen for its affordability, youth-centric design, and enchanting environment, allowing participants to escape to a calming virtual island while engaging with immersive mandalas designed to reduce external distractions and enhance focus (Fig. 1).

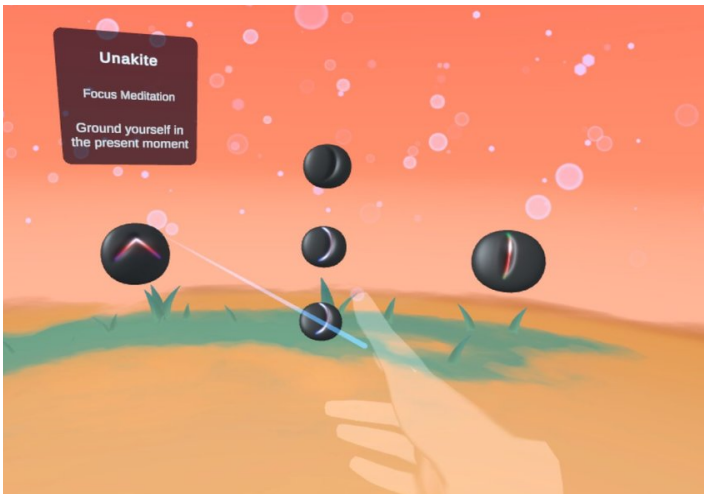

Fig. 1. Portal view of floating rocks with various options for meditation.

2.1 How Adolescents Perceive Their Experiences with VR Meditation

Initial findings suggest that VR meditation provides distinct advantages in enhancing mental health awareness and addressing declining adolescent attention spans. Quantitative results demonstrated improved focus ratings post-VR meditation [10]. On average, the adolescents rated their focus at 63% pre-VR meditation, which increased to 80% post-VR meditation—reflecting a 17% improvement. Adolescents who participated in traditional meditation (without using the HMD) also showed a focus increase, from 54% pre-meditation to 77% post-meditation, a 23% improvement. Participants with higher initial distractibility scores experienced the most significant gains in focus, as seen through observations and survey results. Notably, 90% of the adolescents reported that VR meditation improved their focus during the study, and all participants (100%) found VR meditation more engaging than traditional methods, expressing a preference for continuing VR meditation in the future. Traditional methods include meditation without the help of any devices or by listening to meditation through a speaker. The VR meditation that engaged the adolescents was fully immersive, with the sounds so close to the ears that it blocked out all other distractions. The Maloka VR application also displayed a vortex surrounding the user to block all visual distractions (Fig. 2).

Fig. 2. Pulsing vortex in Maloka VR.

Qualitative analysis identified four key themes: *attention, distractibility, engagement, and relaxation* [10]. The participants consistently reported improved focus and reduced distractibility after VR meditation. The immersive nature of VR minimized external interruptions, enhancing concentration during meditation and subsequent tasks. Maloka VR's gamified elements—such as avatars, achievement rewards, and captivating audio-visual features—further stimulated participant engagement. For instance, one of the adolescents told their avatar, "Don't worry, little buddy, I will see you tomorrow." Developing relationships with avatars and connections with Maloka Island helped the participants develop positive meditation practices. Most adolescents noted increased calmness and relaxation following VR meditations, describing how these effects positively influenced their daily routines at home and school. For instance, one participant noted, "It helped me be absorbed in relaxation and stay focused" while another remarked, "The VR aspect improved my experience because I was less distracted."

2.2 Implementations in Schools

The findings from this study demonstrate clear advantages of using VR meditation as an educational tool. Therefore, it is worthwhile for teachers and administrators to explore practical and feasible strategies for school-based implementation. VR meditation offers a versatile and scalable intervention that can be integrated into various school settings to support student well-being, attention training, and self-regulation. The participants' comments showed that through the sessions, they could see the benefits of VR meditation in their lives such that some even chose to do it independently at home (using their personal HMDs or one that they borrowed from the research lab). For instance, some participants visited Maloka Island for a VR meditation session before a stressful test, competition, or rehearsal, and even to help them fall asleep [10].

VR meditation could be implemented in schools as a pre-class activity, during study breaks, or before exams to help students regulate stress and improve cognitive focus. School counsellors and educational assistants could use VR meditation as a tool for teaching students self-regulation strategies. Additionally, many schools in Saskatchewan have Zen rooms; VR could provide another tool to enhance the Zen room, especially if the school is limited in space, as VR extends the user's environment. VR meditation can benefit students by helping them regulate and refocus their attention, such as before school starts to help energize a student who has had a rough night or before a test for specific individuals who suffer from test anxiety [7]. It is important to note that VR meditation is not limited to one subject or situation, as the meditation sessions are designed to help in multiple situations for each unique individual.

Due to budget constraints and cuts within contemporary education systems, it is uncommon for a school to have a class set of HMDs. To reach more adolescents and offer this VR-facilitated self-regulation skill to their entire population, one classroom set with a trained teacher could travel through the schools of a division, province or territory to enhance and engage students in VR meditation to increase attention rates. This travelling group could also train the school counsellor or learning resource teacher (LRT) if the school wishes to purchase one HMD to use as needed for those individuals who would benefit from ongoing meditation practice. By implementing cost-effective and scalable strategies, schools can leverage the benefits of VR meditation to support student well-being, attention training, cognitive engagement, and emotional regulation.

3 Conclusions and Recommendations for Future Research

This exploratory study provides initial evidence that VR meditation has benefits for training attention and enhancing focus for learning. Given the small sample size (n=11), future research should expand on these findings with larger, more diverse participant groups to strengthen the trustworthiness and reliability of results. Moreover, longitudinal studies are needed to investigate the long-term effects of VR meditation on cognitive, emotional, and mental health, particularly for individuals with attention-related learning disabilities. Within this study, five participants disclosed that they had learning disabilities, including ADHD, anxiety, and autism. Although this exploratory research did not specifically examine the differential effects of VR meditation across these conditions, the findings indicate strong potential for targeted investigations. Future studies should identify the most effective intervention durations and strategies to ensure sustainable benefits for neurodiverse students. Researchers, educators, and developers should emphasize inclusive design principles that make learning accessible for learners from diverse backgrounds and abilities.

Integrating VR meditation with generative AI presents new opportunities for future research on personalizing immersive learning experiences based on user preferences and biometric feedback. While AI-driven adaptive learning can further enhance the effectiveness and accessibility of VR interventions, these advancements must be approached with critical attention to ethical considerations, including data privacy, consent, algorithmic bias, and the potential for over-reliance on AI [12]. Additionally, understanding how to mitigate the potential cognitive challenges posed by AI-generated content—such as reduced attention and creativity—will be essential for achieving a balanced and harmonious integration of these tools.

We may need VR meditation training more than ever, with AI-generated content threatening to erode attention further and reduce the need for critical thinking and ingenuity. As adolescents navigate a digital landscape filled with constant distractions, VR meditation may play a vital role in helping them reclaim focus and build cognitive resilience. Future research should explore how emerging and converging technologies—such as VR, AI, and digital games—can be leveraged ethically and effectively to foster sustained attention, enhance learning outcomes, and promote holistic well-being.

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