

CULTURAL INTEGRATION IN MEDITATION TECHNOLOGY

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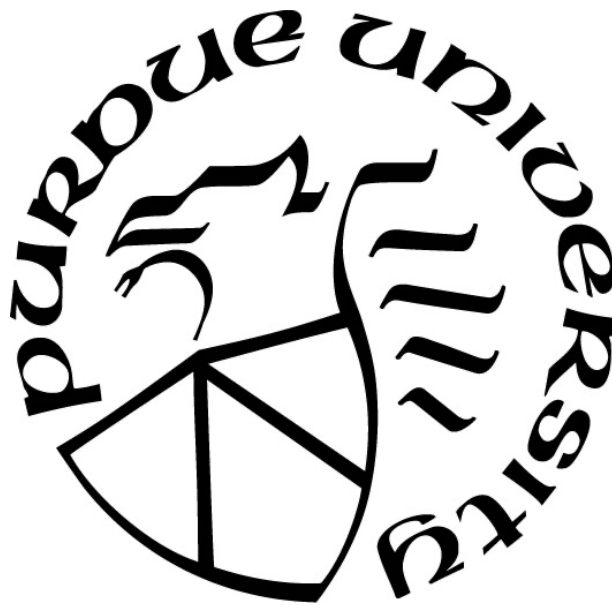
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ABSTRACT

1. INTRODUCTION

Meditation practices have gained unprecedented popularity in recent years, particularly through digital platforms and applications. Statistics indicate millions of users worldwide now engage with meditation apps for stress reduction and mental well-being enhancement (Gál et al., 2021). These digital platforms have made mindfulness practices more accessible, offering guided meditations designed to promote mental well-being and emotional balance (Huberty et al., 2019).

However, despite this growing popularity and accessibility, users continue to face significant challenges in maintaining consistent meditation practice. Studies indicate high dropout rates among meditation app users, with many practitioners struggling to maintain long-term engagement (Schlosser et al., 2019). Common difficulties include maintaining focus during sessions, connecting with abstract meditation concepts, and finding personal relevance in standardized practices (Kang et al., 2019). These challenges often lead to discontinued use of meditation apps and abandonment of practice altogether (Treleaven, 2020).

Current research predominantly focuses on technological innovations: virtual and augmented reality platforms are being developed to create immersive meditation experiences (Kim et al., 2022; Chen et al., 2023), biofeedback systems are being integrated to monitor and guide meditation progress (Kosunen et al., 2016; Zhang et al., 2023), and AI-driven personalization is being implemented to adapt meditation content (Gál et al., 2021). Interactive meditation environments like ZenVR are exploring new ways to teach meditation techniques (Kim et al., 2022), while projects like MindfulBloom investigate the potential of AR-based mindfulness interventions (Chen et al., 2023). The RelaWorld system combines VR with neurofeedback for enhanced meditation experiences (Kosunen et al., 2016), and SeekingHeart utilizes biofeedback in VR for mindfulness practice (Zhang et al., 2023). While these technological advances show promise, they primarily address the mechanical aspects of meditation practice rather than its deeper cultural and spiritual dimensions.

A notable gap exists in research examining how cultural integration might enhance meditation engagement and effectiveness. While some studies have explored incorporating cultural elements into meditation technology, such as the Ming Shan Digital Experience with Taoist practices (Frey et al., 2019) and interactive Zen gardens (Segura et al., 2020), comprehensive research on systematic cultural integration remains limited. This gap is particularly

significant given that traditional meditation practices have historically been deeply embedded within cultural contexts that provide meaning, structure, and support for practitioners.

Recent research suggests that cultural elements might play a crucial role in enhancing meditation engagement and effectiveness. Studies in embodied cognition indicate that physical and cultural practices can significantly impact meditation outcomes (Macrine & Fugate, 2020). Traditional cultural practices often provide concrete, tangible elements that can make abstract meditation concepts more accessible and engaging. For instance, the Ethereal Phenomena project, which combines Tibetan art with breathing exercises (Bernal & Portugues, 2020), demonstrates how cultural elements can enhance user engagement with meditation practices.

The integration of cultural practices into digital meditation platforms represents a potentially valuable, yet underexplored, approach to addressing user engagement challenges. While technological innovations continue to advance, the role of cultural integration in enhancing meditation practice and user retention remains poorly understood. This gap in research becomes particularly relevant as meditation apps increasingly influence how millions of people approach contemplative practice worldwide.

This study addresses this research gap by investigating how the integration of specific cultural elements into digital meditation platforms might enhance user engagement and practice effectiveness. By examining the potential of combining traditional cultural practices with modern meditation technology, this research aims to contribute to our understanding of creating more engaging and sustainable meditation experiences. The findings could have significant implications for how we approach the design and implementation of meditation technology, potentially leading to improved user retention and more meaningful practice experiences.

1.1 Statement of the Problem

While research in digital meditation continues to expand, there remains a significant gap in our understanding of how cultural integration might enhance meditation practices in digital contexts. Current research predominantly focuses on technological innovations such as virtual reality (Kim et al., 2022), augmented reality (Chen et al., 2023), and biofeedback systems (Kosunen et al., 2016). However, systematic investigation into the potential benefits of incorporating traditional cultural elements into digital meditation platforms remains notably limited.

The incorporation of cultural elements into meditation technology has shown promising initial results in isolated studies. For instance, projects like the Ming Shan Digital Experience with Taoist practices (Frey et al., 2019) and the integration of Tibetan art elements (Bernal & Portugues, 2020) suggest potential benefits of cultural integration. However, comprehensive research examining the effectiveness of such cultural integration, particularly in terms of user engagement and practice enhancement, is scarce. This lack of systematic research limits our understanding of whether and how cultural elements might contribute to more effective digital meditation experiences.

This research gap becomes particularly significant as we seek diverse approaches to enhance digital meditation practices. While technological solutions continue to advance, the potential value of cultural integration remains largely unexplored and empirically unverified. Without sufficient research in this area, we lack the evidence-based insights needed to determine how cultural elements might be effectively incorporated into digital meditation platforms and what benefits such integration might offer to practitioners.

1.2 Propose

This study aims to investigate how the integration of cultural elements, specifically combining loving-kindness meditation with mandala practices, can enhance user engagement and effectiveness in digital meditation experiences. Through this research, we seek to develop and evaluate an innovative approach that bridges traditional cultural practices with modern meditation technology.

1.3 Research Questions

This research aims to address several core questions:

1. How does the integration of mandala creation, as a cultural practice, influence user engagement and the cultivation of compassion in digital Loving-Kindness Meditation (LKM)?
2. Which specific elements of mandala creation (e.g., symmetry, color choice, complexity of patterns) do experts identify as most effective in enhancing the LKM experience?

3. How does the combined mandala-LKM practice compare to traditional LKM in terms of user engagement and perceived effectiveness, based on participants' experiences in the two rounds of testing?

By investigating these questions, we hope to gain insights that could lead to more effective and accessible meditation practices, particularly for those who find traditional LKM challenging.

1.4 Significance

The significance of this research lies in its potential to advance our understanding of how cultural integration can enhance digital meditation practices. By investigating the combination of traditional practices with modern technology, this study contributes to the evolving landscape of meditation applications and their effectiveness. The findings may lead to more culturally inclusive and engaging meditation experiences, potentially benefiting practitioners from diverse backgrounds.

The research also contributes to the preservation and adaptation of traditional practices in the digital age, offering insights into how ancient wisdom can be meaningfully integrated with modern technology. These findings may inform the development of more effective and culturally sensitive meditation applications, ultimately supporting individual and collective well-being in our increasingly digital world.

1.5 Assumptions

The following assumptions will be made in this research study:

1. Expert participants have sufficient knowledge and experience with both LKM and mandala practices to provide valid insights about their integration.
2. Study participants will have the basic technological capability to engage with digital meditation platforms.
3. Study participants will provide honest and accurate responses in interviews, surveys, and feedback sessions, rather than what they think the researcher wants to hear.
4. The digital platform can adequately represent and deliver both LKM and mandala practices in a meaningful way.

5. Participants will engage with the practices as instructed, following the guidelines provided rather than rushing through the experience.
6. Cultural practices like mandala creation can be meaningfully translated into a digital format while maintaining their essential benefits.
7. The measurement tools (surveys, interviews, user testing) can effectively capture participants' experiences with both traditional and integrated practices.

1.6 Limitations

The limitations of the research study are as follows:

1. The study sample consists only of students at Purdue University, limiting the generalizability of results.
2. The digital platform may not fully replicate the authentic experience of traditional mandala creation and LKM practices.
3. The study's short duration prevents measurement of long-term effects of the integrated practices.
4. Self-reported data may contain participant bias and only captures short-term effects.
5. Translation of traditional concepts to English may lose cultural nuances.
6. Current technology limitations may affect the quality of the digital meditation experience.
7. Budget and time constraints restrict platform development and refinement possibilities.
8. Variations in participants' cultural backgrounds and prior meditation experience may influence results.

1.7 Delimitations

The following boundaries have been deliberately set for this research:

1. This study focuses specifically on the integration of mandala practices with loving-kindness meditation, rather than exploring other forms of cultural integration in meditation.
2. The research includes only students from Purdue University as participants.
3. The study examines only English-language implementations of the integrated practices.
4. The investigation focuses on specific aspects of mandala creation rather than all possible cultural elements.

5. User testing sessions are limited to a predetermined duration to ensure consistent evaluation.
6. The study measures only immediate and short-term effects rather than long-term impact.
7. The research examines a specific subset of mandala practices selected for their potential compatibility with digital implementation.

1.8 Definition of Terms

Loving-Kindness Meditation (LKM) - A contemplative practice designed to foster unconditional kindness toward self and others through systematic mental training (Graser & Stangier, 2019; Hoge et al., 2021).

Mandala - A sacred geometric configuration of symbols, typically arranged in a circular pattern, used in Buddhist traditions as a tool for meditation, spiritual practice, and teaching (Potash et al., 2020).

Cultural Integration - The thoughtful incorporation of traditional cultural elements and practices into contemporary digital platforms while maintaining their authentic meaning and purpose (Selmanovic et al., 2020).

Digital Meditation - Meditation practices that are facilitated through technological platforms, including mobile applications, virtual reality, and other digital interfaces (Gál et al., 2021; Huberty et al., 2019).

User Engagement - The extent and quality of user interaction with digital platforms, measured through behavioral, cognitive, and emotional involvement (Kang et al., 2019).

Compassion Cultivation - A systematic approach to developing empathy, kindness, and caring attitudes toward oneself and others through structured meditation practices (Mascaro et al., 2020).

1.9 Summary

This chapter established the foundation for investigating cultural integration in digital meditation practices. The research examines how mandala creation influences user engagement and compassion cultivation in digital LKM, which elements of mandala creation are most effective

in enhancing LKM, and how the combined mandala-LKM practice compares to traditional LKM in terms of user engagement and effectiveness.

The significance of this research lies in its potential to enhance digital meditation experiences through cultural integration. This work contributes to the preservation of traditional practices while advancing the development of more effective meditation applications that honor both ancient wisdom and modern technology.

Chapter 2 presents a review of relevant literature on loving-kindness meditation, mandala practices, and digital meditation technologies, establishing the theoretical foundation for this study.

2. LITERATURE REVIEW

While digital meditation platforms continue to evolve through technological innovations, the potential of cultural integration to enhance meditation experiences remains unexplored. This chapter examines existing literature to understand how combining mandala practices with loving-kindness meditation (LKM) might improve digital meditation engagement and effectiveness.

The review is organized into four sections: Loving-Kindness Meditation, Mandala Practices, Digital Meditation Technology, and Cultural Integration in Digital Platforms. A systematic search was conducted using ACM Digital Library, Google Scholar, and PsycINFO databases, focusing on publications from 2019-2024, with selected historical sources providing traditional context.

This structured analysis builds a foundation for understanding how cultural elements might enhance meditation technology, progressing from traditional practices to their potential integration in modern digital platforms.

2.1 Methodology for the Review of the Literature

This literature review utilized three major databases: ACM Digital Library, Google Scholar, and PsycINFO. The search focused primarily on publications from 2019-2024, with selected inclusion of older sources for historical context. Key search terms included "digital meditation," "loving-kindness meditation," "mandala practices," "cultural integration," "compassion cultivation," and "meditation technology."

The review process concentrated on identifying intersections between mandala practices and loving-kindness meditation, particularly their shared goal of cultivating compassion. Both practices have demonstrated effectiveness in enhancing compassion and emotional well-being through different approaches – LKM through directed contemplative practice (Graser & Stangier, 2019), and mandala creation through symbolic and artistic engagement (Potash et al., 2020). This intersection provides a theoretical foundation for their integration in digital platforms.

The literature search expanded into four interconnected areas: compassion enhancement research (Mascaro et al., 2020), traditional meditation practices including both LKM and mandalas (Hoge et al., 2021), digital meditation technologies (Huberty et al., 2019), and cultural integration

in digital platforms (Selmanovic et al., 2020). This structure allows for examining how these practices might work together to enhance compassion cultivation in digital contexts.

Selection criteria prioritized studies that addressed either meditation practices, compassion cultivation, cultural integration, or digital implementations. Studies were excluded if they focused solely on technical aspects without considering user engagement or lacked empirical support. The review specifically sought research that could inform how the integration of these traditional practices might enhance compassion cultivation in modern digital platforms.

The literature is organized thematically, examining first how both LKM and mandala practices independently contribute to compassion development, then exploring their potential synergy in digital applications. This organization reflects the study's aim to understand how combining these cultural elements might enhance digital meditation while identifying current research gaps in this area.

2.2 Loving-Kindness Meditation (LKM)

Loving-kindness meditation (LKM), known as "metta bhavana" in Buddhist traditions, is a practice aimed at cultivating feelings of warmth and care towards oneself and others. Originating from Theravada Buddhism, LKM has garnered significant attention in Western psychological research over the past few years (Graser & Stangier, 2019; Hoge et al., 2021).

Recent research has revealed several key benefits of LKM practice. Studies have shown that regular practice of LKM can increase positive emotions and decrease negative emotions (Hoge et al., 2021; Seppälä et al., 2020). In terms of interpersonal relationships, LKM has been associated with enhanced social connectedness and improved relationship satisfaction (Karremans & Kappen, 2019; Pepping et al., 2021).

A systematic review by Graser and Stangier (2019) found that LKM interventions were associated with improvements in self-compassion and mindfulness, contributing to overall psychological well-being. Furthermore, neuroimaging studies have demonstrated that LKM can lead to changes in brain regions associated with emotional regulation and empathy (Mascaro et al., 2020; Kim et al., 2020), suggesting neuroplastic effects of the practice.

Current LKM practices typically employ two primary training methods, based on an exploration of existing meditation materials:

1. **Phrase repetition:** This method involves repeating phrases of goodwill directed towards various targets, including oneself, loved ones, neutral individuals, difficult people, and all beings.
2. **Scenario visualization:** This technique involves imagining scenarios that evoke compassion and interconnectedness.

However, user feedback and research reveal several challenges that practitioners face. Many practitioners face difficulties in maintaining concentration, while others struggle with emotional barriers, particularly when attempting to generate feelings of love and kindness towards difficult individuals or themselves. Additionally, the abstract nature of LKM can be challenging for some practitioners, especially those who prefer more concrete or structured practices.

These challenges highlight the need for innovative approaches that can address the limitations of traditional LKM practices and make them more accessible and effective for a wider range of practitioners.

2.3 Mandala Practices

Mandalas originate from Tibetan Buddhism, a tradition that emphasizes ritual and symbolism. To fully understand the context of mandala practices, it's important to distinguish between two major Buddhist schools of thought: Zen Buddhism and Tibetan Buddhism. Zen Buddhism emphasizes awakening one's inner nature, compassion, and wisdom through meditation. It is minimalist in approach, focusing primarily on breath-following and mind-emptying techniques. In contrast, Tibetan Buddhism stresses rituals, mantras, and yogic practices. It is more complex, involving the contemplation and invocation of numerous deities and bodhisattvas, as well as intricate ceremonies and prayers.

Mandalas are generally categorized into three types: ritual mandalas used in specific ceremonies and practices, ancient classical mandala paintings which are traditional artworks with deep symbolic meaning, and modern mandalas adapted for various therapeutic and meditative practices in contemporary settings. The use of mandalas in Western psychology was popularized by Carl Jung, who viewed them as symbols of psychic wholeness (Jung, 1973).

The creation of mandalas typically involves a two-step process. The first step is drawing the mandala, which begins from the center with a central pattern and builds outward in regular circular patterns until reaching the desired size. Colors are used according to traditional symbolism,

with each color carrying specific meanings: white represents openness and faith, yellow symbolizes humility and effort, red signifies strength, vitality, and memory, blue represents wisdom, infinity, purity, and life, green symbolizes nature and the balance between humans and earth, gold represents the sun and fire, and black symbolizes darkness or the void.

The second step in traditional practices involves blessing and dissolution. After completion, practitioners meditate on the mandala. In some traditions, the mandala is then brushed away, and the sand is collected and released into a river, symbolizing the impermanence of all things and the spreading of blessings to the world.

Research on mandala creation has revealed several benefits. Henderson et al. (2007) observed that creating mandalas helped individuals process traumatic experiences, indicating their potential for emotional regulation. In terms of anxiety reduction, Curry and Kasser (2005) found that coloring mandalas was more effective in reducing anxiety in adults compared to free-form coloring. The structured nature of mandala creation has also been shown to have calming and focusing effects on practitioners.

Both mandala rituals and meditation align with the four Buddhist sublime states (brahmavihāras): loving-kindness (metta), compassion (karuna), sympathetic joy (mudita), and equanimity (upekkha). The Buddha encouraged cultivating these sublime states as habitual mental attitudes to foster the best possible relationship with the world and everyone in it, as noted by Hofmann et al. (2011).

The structured and creative aspects of mandala practice offer a unique combination of focus and expression, potentially making it a valuable complement to more abstract meditation practices like LKM. This potential synergy forms the basis of our proposed research, aiming to integrate these two practices for enhanced compassion cultivation.

2.4 Compassion Enhancement

Compassion, defined as an emotional response to witnessing suffering coupled with a desire to help (Goetz et al., 2010), serves as a common goal in both loving-kindness meditation and mandala practices. While these practices approach compassion cultivation through different methods, they share the fundamental aim of developing greater empathy and care for self and others.

Loving-kindness meditation directly cultivates compassion through systematic mental training. Research by Klimecki et al. (2013) demonstrates that LKM can increase prosocial behavior and positive affect when facing others' suffering through neuroplastic changes. The practice works by gradually expanding the circle of compassion from self to others, with studies showing increased activity in brain regions associated with empathy and emotional regulation (Mascaro et al., 2020). LKM practitioners show enhanced ability to respond to others' suffering with care and understanding, leading to improved interpersonal relationships and social connections (Weng et al., 2013).

Mandala practices, while less direct in their approach, foster compassion through symbolic representation and mindful creation. The circular nature of mandalas represents wholeness and interconnection, fundamental concepts in compassion cultivation (Potash et al., 2020). Through the creation process, practitioners develop patience, focus, and a sense of universal connection - qualities that support compassionate awareness. Research indicates that mandala creation can reduce anxiety and enhance emotional regulation (Beerse et al., 2020), creating a foundation for compassionate responses to self and others.

Both practices address different aspects of the compassion cultivation challenge. LKM provides explicit training in generating feelings of care and kindness, while mandala practices offer a concrete, embodied approach to developing the stability and awareness necessary for sustained compassion. When combined, these approaches might complement each other: the structured, visual nature of mandala practice could help ground and stabilize the emotional qualities developed through LKM (Friedman et al., 2022).

The integration of these practices shows particular promise in addressing common barriers to compassion cultivation. While LKM directly targets the development of compassionate feelings, some practitioners find its abstract nature challenging. Mandala creation can provide a tangible foundation through its concrete, visual nature. This combination might help practitioners maintain emotional engagement while developing the stability needed for sustained compassion practice (Weng et al., 2020).

Recent research highlighting the connection between artistic expression and emotional development supports this integrated approach. Studies show that engaging in structured artistic practices like mandala creation can enhance emotional awareness and regulation (Henderson et al., 2020), key components in developing stable compassion. Combined with the explicit compassion

training of LKM, this integrated approach might offer a more complete path to developing and maintaining compassionate awareness.

The potential synergy between these practices addresses what Condon and Makransky (2020) identify as key challenges in compassion cultivation: maintaining stability in challenging situations and making practices accessible to diverse practitioners. By combining the direct emotional training of LKM with the grounding, symbolic work of mandala creation, this integration might offer a more robust and accessible approach to developing lasting compassion.

2.5 Integrating mandala practices into LKM

The integration of mandala practices with loving-kindness meditation presents unique opportunities for enhancing meditation experience and effectiveness. Mandala creation, with its roots in Buddhist traditions, offers complementary elements that could address common challenges in LKM practice while potentially deepening its impact. The structured, symbolic, and visually engaging nature of mandalas may provide practitioners with a more concrete foundation for their meditation practice.

Several key elements of mandala creation show particular promise for enhancing LKM. First, the detailed nature of mandala creation demands sustained focus, potentially helping practitioners develop concentration skills applicable to meditation (Beerse et al., 2020). This focused attention aspect could help address common challenges in meditation, such as mind-wandering or difficulty in maintaining concentration (Kang et al., 2019). Second, mandalas serve as visual metaphors for abstract concepts, potentially making LKM's abstract ideas more accessible to practitioners (Potash et al., 2020). This symbolic representation could be particularly beneficial for individuals who struggle with the visualization aspects of traditional LKM practices.

The creative and physical aspects of mandala creation offer additional benefits. The artistic expression involved in creating mandalas might facilitate emotional engagement and expression (Friedman et al., 2022), while the physical act of drawing or coloring engages the body, potentially making it easier for practitioners to connect with and sustain feelings of love and kindness (Weng et al., 2020). This aligns with recent theoretical frameworks in embodied cognition, which suggest that bodily actions can enhance cognitive and emotional processes involved in meditation (Macrine & Fugate, 2020).

The integration of these practices in a digital context offers further possibilities. Digital platforms could enhance the traditional benefits of both practices while adding new dimensions through technology. For example, biofeedback and physiological monitoring could be integrated with mandala creation to provide real-time feedback on the practitioner's emotional state during LKM (Pohl et al., 2023). The digital format also allows for innovative approaches to guidance and practice support, such as adaptive difficulty levels or progressive complexity in mandala patterns based on practitioner experience.

The symbolic nature of mandalas could serve as a tangible focal point for directing feelings of love and compassion, similar to how some digital meditation platforms use visual metaphors to represent inner states (Roo et al., 2017). This concrete representation might help practitioners maintain focus while developing the emotional qualities central to LKM practice. The structured nature of mandala creation could also serve as a preparatory practice, helping practitioners transition into the more abstract aspects of LKM with greater ease and stability.

The combination of these practices aims to create a synergy that addresses the challenges of traditional LKM while maintaining its core benefits. This integration could make meditation more accessible and effective for a wider range of individuals, potentially leading to more effective interventions for enhancing individual and societal well-being (Wielgosz et al., 2019; Prazak et al., 2021). The approach shows particular promise for practitioners who may find traditional LKM challenging or those who benefit from more structured, visually-oriented practices.

2.6 Summary

This literature review has examined the intersection of loving-kindness meditation, mandala practices, and digital technology. The research reveals that while both LKM and mandala practices effectively cultivate compassion through different approaches (Klimecki et al., 2013; Potash et al., 2020), their integration in digital platforms remains unexplored. Current meditation applications focus primarily on technological features, leaving significant potential for cultural integration untapped.

This gap in research supports our investigation into how mandala creation might enhance digital LKM experiences, which elements are most effective, and how the combined approach compares to traditional practices. Based on these findings, Chapter 3 presents the methodology for examining this integration through expert interviews and user testing.

3. RESEARCH METHODOLOGY

3.1 Introduction

This study employs a mixed-methods approach to evaluate the effectiveness of integrating Mandala practices with Loving-Kindness Meditation (LKM) in enhancing user engagement and compassion cultivation. The research is designed to address the following questions:

1. How does the integration of mandala creation, as a cultural practice, influence user engagement and the cultivation of compassion in digital Loving-Kindness Meditation (LKM)?
2. Which specific elements of mandala creation (e.g., symmetry, color choice, complexity of patterns) do experts identify as most effective in enhancing the LKM experience?
3. How does the combined mandala-LKM practice compare to traditional LKM in terms of user engagement and perceived effectiveness, based on participants' experiences in the two rounds of testing?

3.2 Research Design

The study is structured in three main phases:

1. Expert Interviews
2. Application Design and Development
3. User Testing (Two Rounds)

3.3 Phase 1: Expert Interviews

Semi-structured interviews will be conducted with 3-5 experts in Mandala creation and meditation practices. These experts will include monks who regularly organize Mandala creation activities and incorporate meditation into their daily lives.

Sample interview questions include:

- What are the key principles of Loving-Kindness Meditation?
- How might Mandala practices enhance meditation experiences?
- What challenges do beginners face in meditation practices?
- What features would be essential in an app combining LKM and Mandala practices?

Thematic analysis will be used to identify key themes and insights from the expert interviews, which will inform the design and development of the application.

3.4 Phase 2: Application Design and Development

Based on insights from the expert interviews, an application integrating Mandala practices with Loving-Kindness Meditation will be developed. The development process will include:

- Conceptualization and design of user interface and experience
- Integration of Mandala creation tools with guided LKM practices
- Prototyping and internal testing
- Iterative development based on initial feedback

3.5 Phase 3: User Testing

A sample of 20-30 participants, representing a diverse range of meditation experience levels, will be recruited for user testing. The testing will be conducted in two rounds:

Round 1:

- Participants complete pre-test questionnaires (demographics, FFMQ, SCS-SF)
- Participants engage in guided Loving-Kindness Meditation (without Mandala practices)
- Post-session questionnaires (FFMQ, SCS-SF)

Round 2:

- Participants use the developed application integrating Mandala practices with LKM
- Post-session questionnaires (FFMQ, SCS-SF)
- Brief qualitative feedback on the experience

Measures:

1. Five Facet Mindfulness Questionnaire (FFMQ): A 39-item scale assessing five facets of mindfulness.
2. Self-Compassion Scale - Short Form (SCS-SF): A 12-item scale measuring six components of self-compassion.
3. Qualitative feedback: Open-ended questions about the user experience with the application.

Quantitative analysis will include paired t-tests to compare pre- and post-scores for each round, and repeated measures ANOVA to compare changes across both rounds. Effect sizes will be calculated to determine the magnitude of any changes.

Qualitative analysis will involve thematic analysis of user feedback to identify key themes regarding user experience and perceived benefits of the integrated approach.

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