# Enhancing Pilgrims' Understanding of Thawaf through the Android Satu Haji Application in a Digital-Based Manasik Program

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***Abstrak*** *– Program manasik haji berbasis digital dirancang untuk meningkatkan pemahaman dan keterampilan jamaah dalam melaksanakan ibadah thawaf, salah satu rukun penting Haji. Penelitian ini menggunakan aplikasi Android Satu Haji, yang dikembangkan oleh Kementerian Agama, sebagai media pembelajaran interaktif yang menyediakan panduan visual, doa, peta ritual, dan simulasi langkah-langkah thawaf. Metode yang diterapkan adalah pendekatan partisipatif dan deskriptif, menggabungkan pembekalan teori, simulasi praktis di miniatur Ka'bah, serta observasi dan wawancara dengan pembimbing kegiatan. Penilaian kuantitatif dilakukan oleh narasumber terhadap pemahaman prosedural, keterampilan praktik, konsentrasi, antusiasme, dan kepercayaan diri peserta, sementara data kualitatif diperoleh dari catatan lapangan dan wawancara. Hasil menunjukkan bahwa sebagian besar peserta memperoleh pemahaman prosedural yang baik (80–95%), sikap khusyuk dan kesungguhan tinggi (95%), serta antusiasme terhadap metode digital yang kuat (95%). Temuan ini menegaskan bahwa integrasi aplikasi digital dengan bimbingan langsung tidak hanya meningkatkan pemahaman dan keterampilan ritual, tetapi juga memperkuat kesiapan spiritual jamaah. Studi ini memberikan kontribusi signifikan dalam pengembangan manasik haji modern yang memadukan teknologi, pendidikan agama, dan praktik berbasis pengalaman.*

***Kata Kunci*** *— manasik berbasis digital, aplikasi Android Satu Haji, KBIHU Armina Sukoharjo, pemahaman ibadah haji, literasi digital*

***Abstract*** *– The digital-based manasik hajj program is designed to enhance pilgrims' understanding and practical skills in performing thawaf, a central pillar of Hajj. This study employs the Android Satu Haji application, developed by the Ministry of Religious Affairs, as an interactive learning platform providing visual guidance, prayers, ritual maps, and step-by-step thawaf simulations. The methodology combines participatory and descriptive approaches, integrating theoretical briefings, practical simulations at a Ka'bah miniature, and observational interviews with program facilitators. Quantitative assessments were conducted by facilitators on participants' procedural understanding, practical skills, focus, enthusiasm, and confidence, while qualitative insights were drawn from field notes and interviews. Results indicate that most participants achieved high procedural comprehension (80–95%), strong devotion and focus (95%), and positive engagement with the digital learning method (95%). These findings demonstrate that integrating digital applications with direct mentorship effectively enhances both ritual competency and spiritual readiness. This study contributes to the development of modern manasik hajj programs by harmonizing technology, religious education, and experiential practice.*

***Keywords*** *— digital-based manasik, Android Satu Haji application, KBIHU Armina Sukoharjo, Hajj ritual understanding, digital literacy*

## 1. INTRODUCTION

The Hajj pilgrimage constitutes one of the central pillars of Islam and represents a profound act of spiritual submission, unity, and discipline. As one of the largest annual religious gatherings in the world, the pilgrimage requires not only deep devotion but also accurate comprehension of the prescribed rituals, including *thawaf*, *sa'i*, *wuquf*, and other essential acts [1]. To ensure that pilgrims fulfill these obligations correctly, structured preparatory programs known as *manasik hajj* have been institutionalized across Muslim societies. These programs combine theoretical instruction with ritual simulation, providing participants with an opportunity to acquire both procedural

and spiritual readiness. However, despite their crucial role, the effectiveness of conventional *manasik hajj* remains limited by pedagogical and logistical constraints.

Traditional instructional models predominantly rely on direct lectures, printed manuals, and one-time practical demonstrations [2]. Such methods, while effective for conveying core information, often fall short in promoting long-term retention and personalized learning. Participants, particularly the elderly, frequently struggle with memorizing sequential steps, recognizing ritual landmarks, and maintaining correct physical orientation during simulations. Furthermore, the absence of interactive and repeatable learning experiences limits the participants' ability to review or reinforce their understanding independently. Consequently, there is a growing need to reform the conventional model of *manasik hajj* through the incorporation of more adaptive and technology-enhanced learning strategies.

The rapid advancement of digital technologies has transformed pedagogical practices across various educational domains, including religious education [3]. The integration of mobile applications, multimedia simulations, and virtual learning environments has redefined the accessibility and flexibility of religious instruction [4]. In this context, digital transformation is not merely a matter of technological adoption but represents a paradigm shift in how sacred knowledge is delivered, practiced, and internalized. The use of digital platforms allows learners to transcend spatial and temporal limitations while engaging in more personalized and continuous forms of learning. Such innovations are particularly relevant in preparing pilgrims who must combine cognitive understanding, procedural fluency, and emotional readiness.

Among the most notable technological developments supporting Hajj education in Indonesia is the Satu Haji application—an Android-based platform officially introduced by the Ministry of Religious Affairs [5]. This application consolidates textual, visual, and auditory materials related to Hajj guidance, including maps of ritual sites, interactive prayer modules, and step-by-step simulations of *thawaf* and *sa'i*. The platform provides a structured, user-friendly interface that facilitates self-paced learning while maintaining the integrity of religious content. Its inclusion in *manasik hajj* programs thus represents a significant milestone in integrating digital innovation with religious pedagogy [6].

Despite the growing prevalence of such digital applications, empirical studies evaluating their pedagogical impact remain scarce. Most existing research has focused on usability, system design, or user satisfaction, with limited attention given to learning outcomes and behavioral transformation [7]. There is still insufficient evidence on how digital media affect pilgrims' comprehension, engagement, and confidence in performing sacred rituals. Furthermore, the socio-religious dimension of such integration—particularly how digital learning can coexist with the spiritual and communal essence of Hajj preparation—remains an underexplored area [8]. This research seeks to address these gaps through a focused examination of the digital-based *manasik hajj* program emphasizing the ritual of *thawaf*.

The study employs a participatory–descriptive approach that combines community engagement, field observation, and digital intervention. The primary objective is to assess how the integration of the Satu Haji application influences participants' understanding and performance of *thawaf*. The program's design incorporates both theoretical and practical components: classroom-based briefings to strengthen conceptual knowledge and simulation sessions using the mobile application to enhance procedural accuracy. By merging traditional mentorship with technological assistance, the program aims to bridge the gap between ritual theory and embodied practice [9].

During the implementation, participants were introduced to the digital tools and guided through sequential stages of simulation, reflection, and evaluation. The Satu Haji application was used as an instructional companion, providing visual cues, textual references, and interactive prompts that supported pilgrims in performing each element of *thawaf* correctly. This integration allowed participants to reinforce their understanding through repetition and independent review, even outside formal training hours [10]. Observational data indicated a notable improvement in participants' confidence, precision, and spiritual engagement during the simulation sessions.

This study contributes to the growing discourse on the digital transformation of Islamic education by offering an empirical account of how mobile technology can enhance religious ritual comprehension and participation. The novelty of this research lies in its integration of a government-endorsed mobile application into a community-based *manasik hajj* framework, supported by both quantitative and qualitative evaluations. Beyond its immediate pedagogical significance, the initiative reflects broader ethical and social commitments—namely, promoting inclusivity, accessibility, and lifelong spiritual learning through technology. The digital-based *manasik hajj*

program thereby exemplifies how technological innovation can coexist with religious devotion, reinforcing the harmony between faith, knowledge, and modernity.

## 2. METHODOLOGY

The method of implementation in this community-based digital program was designed to integrate religious education, experiential learning, and technological innovation. The activity aimed to enhance the understanding of thawaf rituals among prospective pilgrims through the combined use of traditional simulation and the Android Satu Haji application, an official digital platform developed by the Indonesian Ministry of Religious Affairs. The methodological framework adopted a participatory-descriptive approach, emphasizing interaction between instructors, participants, and digital media within a structured manasik session [11], [12]. The program was implemented through a series of carefully planned stages, from conceptual preparation and digital setup to guided practice and instructor-led evaluation.

### 2.1 Research and Design Framework

The research and design framework of this program was established through a participatory–descriptive approach, combining traditional religious instruction with digital learning innovation. This approach was chosen to bridge the gap between theoretical understanding and practical readiness among calon jamaah haji (prospective pilgrims), particularly in mastering the thawaf ritual. The participatory aspect emphasized active engagement and interaction between pilgrims and instructors, while the descriptive component focused on observing and documenting behavioral, cognitive, and spiritual changes during the activity [13]. The design also reflected the integration of fiqh-based teachings with applied digital tools, aligning pedagogical goals with the technological capacity provided by the Android Satu Haji application.

The primary methodological objective was to strengthen the pilgrims' comprehension of the thawaf ritual through the use of digital media as an interactive learning platform [14]. The Android Satu Haji application, developed by the Indonesian Ministry of Religious Affairs, provided structured modules that simulate the sequence of thawaf, including the direction of movement, recitation of doa, and related etiquettes. By combining simulation and digital engagement, the program aimed to help participants internalize both the procedural and spiritual dimensions of the thawaf. This design not only supported visual and experiential learning but also allowed participants to gain confidence and reduce anxiety about performing rituals in the real setting of Masjid al-Haram.

The participants of this program consisted of 76 prospective pilgrims, including 30 male and 46 female participants, with 50 categorized as elderly (aged 60 and above). This demographic profile represented a common composition among Indonesian pilgrims, where elderly participants often require practical demonstrations and simplified digital guidance. The instructional design therefore considered inclusivity and accessibility, ensuring that each participant could follow the learning process regardless of age or familiarity with technology. Instructors played an essential role in guiding the elderly in navigating the application while reinforcing religious understanding through face-to-face mentoring and real-time demonstrations.

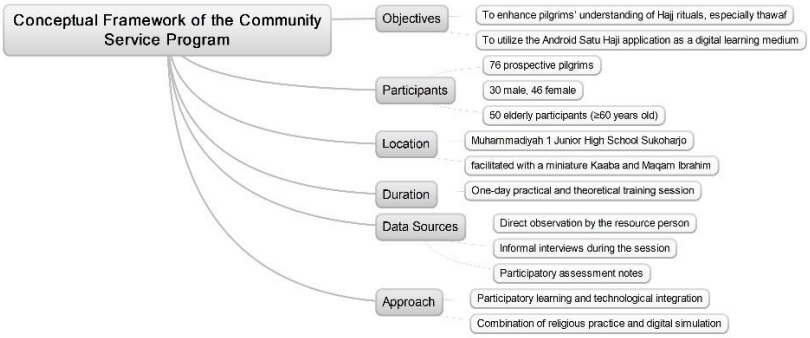



Figure 1. Conceptual Framework of the Digital-Based Manasik Hajj Program Integrating the Android Satu Haji Application

The conceptual structure of the digital-based manasik program is illustrated in Figure 1, which presents the relationship between the main components of the learning process. The diagram consists of three interconnected layers: input, process, and output. The input includes participants, instructors, digital tools, and learning facilities;

the process encompasses theoretical instruction, app-based simulation, and guided thawaf practice; and the output reflects the resulting cognitive understanding, procedural accuracy, and spiritual awareness achieved by the participants. This conceptual model illustrates how technology, when integrated with religious guidance, can enhance the holistic learning experience of manasik haji in community-based education.

## 2.2 Implementation Process

The implementation process of the digital-based *manasik haji* program was structured in a systematic sequence to ensure a comprehensive and meaningful learning experience for all participants. The preparation phase focused on establishing both the technical and instructional foundations required for the program. This began with the installation of the Satu Haji Android application on participants' devices, ensuring that each jamaah could access and operate the application independently [15], [16]. The features were tested collectively, emphasizing the Thawaf Simulation module, which provides visual, textual, and audio guidance for each ritual step. Participants were then divided into smaller guidance groups, each led by a trained instructor responsible for managing learning flow, clarifying procedural details, and assisting with technical issues during the sessions.

The main implementation phase combined theoretical instruction with practical simulation to strengthen the connection between understanding and performance. Each session started with a briefing on the *syar'i* aspects of thawaf, including the niyyah (intention), starting position at Hajar Aswad, counterclockwise movement, and recitation of supplications. Participants then proceeded to perform the ritual using a miniature Ka'bah model, accompanied by real-time prompts from the Satu Haji application. The app functioned as both a learning aid and a monitoring guide, displaying each of the seven rounds, relevant prayers, and visual cues for maintaining orientation. Instructors observed participants closely to evaluate both procedural accuracy and spiritual engagement throughout the activity.

The evaluation stage involved a comprehensive feedback process based on both qualitative and quantitative methods. Instructors and narasumber used structured observations and interviews to assess participants' performance. Each participant's engagement was scored on a 100-point scale, covering aspects such as attentiveness (*khusyuk*), accuracy of motion, understanding of sequence, and interaction level during the simulation. In addition, qualitative reflections were gathered to understand how the digital tools influenced participants' emotional connection to the ritual and their readiness for the actual pilgrimage. This systematic evaluation was vital to determine the impact of the digital intervention and to identify areas for pedagogical improvement.

Figure 2 illustrates the Flow of the Implementation Stages, representing the chronological and logical order of the activities carried out during the program. The flow begins with Preparation, which includes installation, briefing, and grouping, ensuring readiness in both technology and understanding. The process then moves into Simulation, where participants engage directly in thawaf practice guided by both instructors and the Satu Haji application.

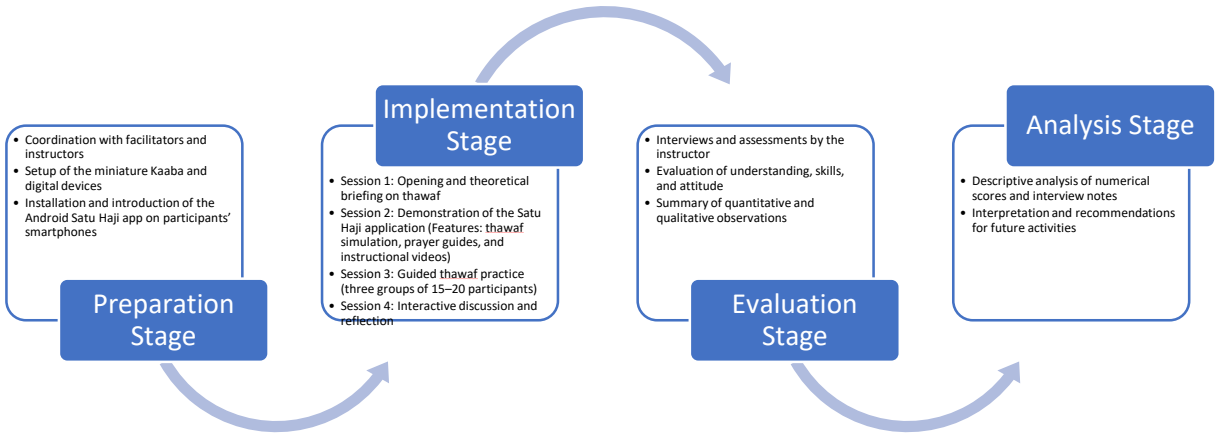



Figure 2. Flow of Implementation Stages in the Digital-Based Manasik Program

The next stage in Figure 2, Interaction, represents the dynamic engagement between instructors and participants during the ritual simulation. Questions, clarifications, and feedback occur in real time, enabling iterative learning where misunderstandings are immediately addressed. This interactive element is essential to the participatory-descriptive approach, fostering an environment of collaborative reflection and active involvement.

Following interaction, the process advances to the Assessment stage, where structured observation and interviews are conducted to evaluate performance outcomes. This phase captures both the cognitive understanding of thawaf rules and the affective elements such as sincerity, emotional calmness, and confidence. Finally, the flow concludes with Reflection, encouraging both participants and facilitators to evaluate the learning process and spiritual outcomes. Reflection sessions were conducted through short group discussions, allowing participants to express personal insights about their experience and the usefulness of digital tools in enhancing spiritual comprehension.

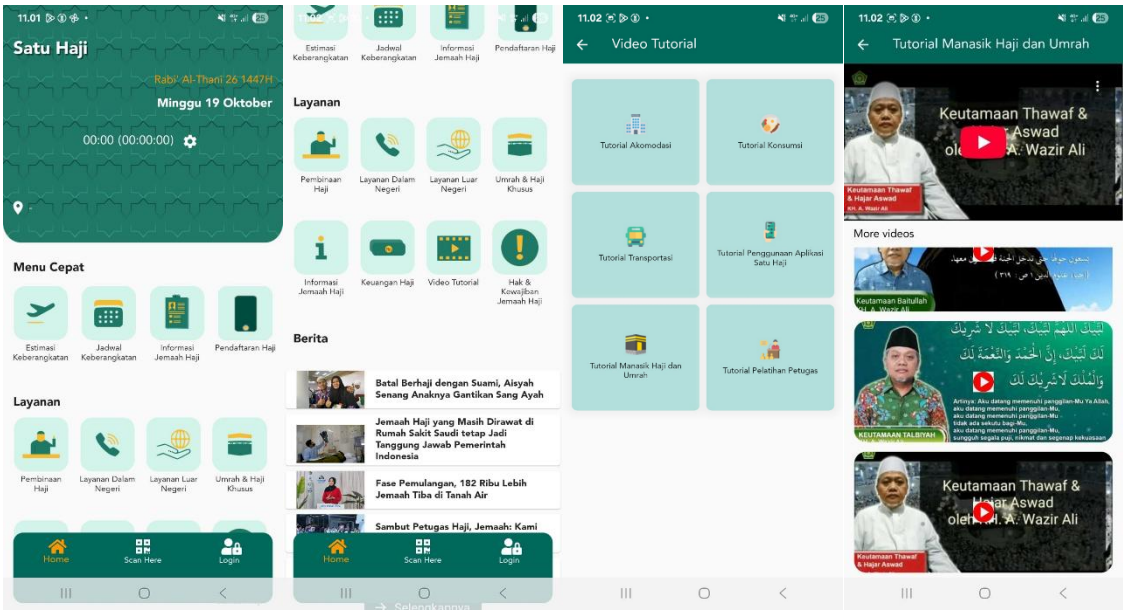



Figure 3. Main Interface of the Android Satu Haji Application

Figure 3 presents the Interface of the Satu Haji Android Application, highlighting several key features that support the thawaf learning process. The interface includes an *interactive thawaf guide* displaying real-time position tracking, *doa recitation panels* that synchronize with each round, and a *map of miqat locations* for contextual understanding. The design emphasizes simplicity and accessibility, accommodating participants of varying ages and technological familiarity—especially the elderly pilgrims. This visual and interactive interface allowed participants to connect digital experience with religious meaning, reinforcing both technical proficiency and spiritual reflection within the manasik program.

## 2.3 Data Analysis and Ethical Considerations

The data used in this community-based study were obtained through direct field observation, informal interviews, and structured assessment records. Observations were conducted throughout the manasik sessions to capture participant behavior, attentiveness, and interaction patterns during the thawaf simulation [17], [18]. Additional data were gathered from brief interviews with both the pilgrims (*jamaah*) and the instructors (*pembimbing*), focusing on their perceptions of the Satu Haji application and its usability in supporting ritual understanding. Quantitative scores were compiled from the assessment sheets filled out by the instructors, including measures of thawaf comprehension, participation rate, spiritual engagement, and enthusiasm toward the digital learning approach.

The analysis process employed a descriptive–interpretive method, integrating both numerical summaries and qualitative insights [19], [20]. Quantitative results were tabulated using frequency and percentage calculations to illustrate the general level of understanding and engagement among the participants. For instance, data showing 85% correct understanding of thawaf procedures and 95% active participation were interpreted in relation to observable behavioral indicators during the practice. Meanwhile, qualitative comments from the instructors and participants were analyzed thematically to identify recurring ideas, such as the usefulness of visual guidance, the ease of digital access, and the emotional impact of practicing thawaf through simulation. This mixed descriptive approach allowed for a comprehensive portrayal of how digital tools supported both cognitive and affective learning dimensions.

From an ethical standpoint, the study adhered to principles of respect, confidentiality, and spiritual integrity. The activity was conducted under the official approval of the KBIHU management, ensuring compliance with institutional and religious guidelines. Special attention was given to elderly participants, providing technical and physical assistance throughout the sessions to maintain safety and comfort. Data collection was carried out

respectfully, avoiding any intrusion into participants' personal religious expressions. All identities and individual responses were kept confidential, and no identifiable information was disclosed in the reporting process. Furthermore, the facilitators maintained the sacred atmosphere of the worship simulation, ensuring that technology served as an aid to devotion rather than a distraction from it.

## 3. RESULTS AND DISCUSSION

The digital-based *manasik hajj* program that used the Android Satu Haji application showed positive outcomes in helping participants understand and practice the *thawaf* ritual more effectively. Through a combination of direct instruction, guided simulation, and digital support from the application, participants were able to visualize each step of the ritual clearly and practice it with better confidence. The use of the app also made it easier for participants, especially the elderly, to review the *du'a* and directions repeatedly at their own pace. Overall, the results reflect that integrating technology into *manasik* activities can make the learning process more engaging, structured, and accessible for all participants.

### 3.1 Quantitative Results

This subsection presents the numerical outcomes of the digital-based *manasik haji* program, focusing on participants' understanding, practical performance, and engagement with the Satu Haji Android application. The evaluation used a 100-point scale to measure participants' achievements in cognitive, affective, and psychomotor domains. Quantitative data were collected through structured observation, facilitator scoring sheets, and interview responses that were subsequently converted into percentage form. The analysis focused on assessing how effectively the program improved both theoretical understanding and practical skills related to *thawaf*.

The overall results indicate that participants achieved strong levels of comprehension and engagement. Most indicators reached scores above 80%, demonstrating that the combination of traditional guidance and digital visualization enhanced the participants' readiness for real *hajj* experiences. The *Satu Haji* application functioned not merely as a learning aid but as an integrative tool—bridging the cognitive understanding of *manasik* rituals with experiential simulation. Through this process, participants could review prayers, recognize the correct direction of rotation, and maintain focus on spiritual intentions during *thawaf* practice.

Table 1. Quantitative and Qualitative Assessment of Participants' Understanding and Engagement

| No. | Indicator | Description | Percentage (%) | Qualitative Level |
|---|---|---|---|---|
| **1** | Understanding of Hajj Rites | Correct knowledge of *rukun* and *wajib* hajj | 80 | Good |
| **2** | Understanding of Thawaf Procedure | Direction, *niyyah*, start point, *du'a*, and manners | 85 | Very Good |
| **3** | Spiritual Meaning of Thawaf | Awareness of obedience and devotion to Allah | 70 | Fair |
| **4** | Practical Thawaf Skills | Ability to perform simulation correctly and independently | 80 | Good |
| **5** | Positional Adjustment Accuracy | Correct rotation and movement from Hajar Aswad | 95 | Excellent |
| **6** | Interaction and Questioning | Activeness in asking questions and responding | 40 | Low |
| **7** | Concentration and Devotion | Focus and sincerity during *manasik* sessions | 95 | Excellent |
| **8** | Confidence in Hajj Preparation | Readiness and calmness for real hajj experience | 80 | Good |
| **9** | Enthusiasm for Digital Learning | Positive response to the Android *Satu Haji* application | 95 | Excellent |

The results summarized in Table 1 demonstrate that participants performed remarkably well in domains related to *thawaf* accuracy, devotion, and digital engagement. Indicators such as Positional Adjustment Accuracy and Concentration and Devotion both achieved an *Excellent* level (95%), reflecting the effectiveness of the visual and interactive guidance offered by the *Satu Haji* application. These features enabled users to follow the correct direction, maintain rhythm in movement, and stay focused during simulation, contributing to a more immersive and reflective learning experience. The high enthusiasm for digital learning (95%) also signifies strong acceptance of mobile-based religious education among the participants.

Meanwhile, the Understanding of Thawaf Procedure (85%) and Practical Thawaf Skills (80%) indicate that most participants could correctly perform the ritual steps and demonstrate readiness for real practice. The Understanding of Hajj Rites also achieved a *Good* level (80%), confirming that digital support complemented the facilitators' verbal explanation effectively. However, the Spiritual Meaning of Thawaf scored relatively lower (70%), suggesting that while procedural mastery was achieved, deeper emotional and theological reflection requires more attention. This highlights an opportunity to integrate spiritual mentoring elements—such as guided reflection or discussion on the symbolism of *thawaf*—in future digital modules.

Another notable observation concerns the Interaction and Questioning indicator, which received the lowest score (40%), categorized as *Low*. This implies that despite their enthusiasm, many participants were still hesitant to engage in active discussion or ask questions during the sessions. Several factors may contribute to this, such as generational gaps in digital literacy, modesty norms in group learning, or time constraints during practice. Encouraging open dialogue and providing additional question-and-answer sessions may therefore enhance participant interaction and critical engagement in subsequent programs.

The quantitative data affirm that the digital-based *manasik haji* program successfully improved the participants' understanding and confidence in performing *thawaf*. The balanced combination of theoretical teaching, digital visualization, and direct simulation yielded measurable improvements across multiple domains. These findings support the growing relevance of hybrid religious education models, where faith-based instruction is strengthened through the accessibility and interactivity of mobile technology.

## 3.2 Qualitative Insights and Field Observations

The qualitative analysis highlights how the *digital-based manasik haji* program successfully merged traditional religious learning with the interactive support of the Android Satu Haji application. The classroom sessions provided an essential foundation for understanding the *rukun* and *wajib* of *hajj*, especially the *thawaf* ritual. As shown in Figure 5, participants attentively listened to the facilitators' presentation while following along with slides and the application interface projected on the screen. The image illustrates a lively learning atmosphere—participants taking notes, asking questions, and exchanging reflections about their past *hajj* experiences. This environment fostered an open dialogue between facilitators and participants, allowing even elderly pilgrims to express curiosity and clarify practical details such as the correct starting point, the *niyyah* (intention), and the appropriate prayers for each circumambulation.




Figure 5. Classroom Session and Theoretical Briefing during the Digital-Based Manasik Program

The use of digital visualization during this theoretical stage helped bridge the cognitive gap often faced by first-time pilgrims. By displaying animated representations of *thawaf* sequences and prayer recitations, the Satu Haji application supported comprehension beyond verbal explanations. Many participants, particularly senior ones, mentioned that seeing the movement patterns and directions on-screen made the procedures more tangible and easier to remember. The facilitators observed that this visual engagement increased participants' attentiveness and reduced confusion over ritual orientation, such as distinguishing the position of *Hajar Aswad* or understanding

when to recite specific *du'a*. The digital layer thus became not merely an aid, but an interactive learning medium that deepened the participants' conceptual understanding.

In the next stage, participants transitioned from theory to practice, as shown in Figure 6, which captures the *thawaf* simulation activity conducted around a miniature Ka'bah within the training area. The photo shows small groups of participants walking in sequence while holding printed *du'a* guides and referring to the Satu Haji app displayed on their mobile devices. Each group was guided by facilitators who provided direct feedback on posture, rotation accuracy, and prayer timing. This stage represented the culmination of digital-assisted learning—participants applied what they had learned in real motion, aligning physical performance with digital prompts and spiritual focus. Observers noted that participants who initially struggled with memorization or spatial coordination showed marked improvement once the app's visual cues were integrated into their movement.



Figure 6. Practical Simulation of Thawaf with Guided Recitation and Use of the Android Satu Haji Application

Beyond the technical aspects, the simulation produced strong emotional and spiritual responses. Many participants, especially the elderly, expressed feelings of reverence and connection as they performed *thawaf* while hearing the *du'a* through the app's audio feature. The facilitators described the atmosphere as solemn yet energized, reflecting both concentration and joy. This suggests that combining digital technology with collective practice does not diminish the sanctity of the ritual; instead, it enhances understanding while maintaining spiritual depth. Participants also appreciated how the application provided immediate references, reducing anxiety about forgetting prayers or losing sequence during the actual pilgrimage.

Field observations and facilitator interviews further confirmed the participants' readiness and confidence for the upcoming *hajj* journey. The digital tools proved particularly useful in reinforcing procedural memory, while the in-person mentorship ensured theological correctness and spiritual meaning. This synergy between human guidance and digital assistance illustrates a pedagogical balance—technology structured the learning experience, while facilitators nurtured personal reflection and discipline. The overall result was a more immersive, participatory, and spiritually mindful preparation for *thawaf*, setting a model for future *manasik* programs that integrate faith and technology seamlessly.

## 4. CONCLUSION

The implementation of the *Digital-Based Manasik Haji Program*, integrating the Android Satu Haji application, proved to be an effective approach to enhance participants' understanding and practical skills in performing *thawaf*. The combination of theoretical briefing, interactive discussion, and guided simulation created a comprehensive learning experience that merged spiritual reflection with technological engagement. Quantitative data showed strong outcomes in procedural comprehension and enthusiasm for digital learning, while qualitative observations revealed increased confidence, devotion, and readiness among the pilgrims.

This study also demonstrated that digital tools, when aligned with proper religious guidance, can serve as valuable instruments for strengthening religious literacy without reducing spiritual depth. The Satu Haji application not only facilitated cognitive understanding but also supported emotional connection during ritual

practice. The synergy between instructors' mentorship and digital assistance established a new pedagogical model for *manasik haji* that is both adaptive to modern learning needs and faithful to Islamic principles.

## 5. RECOMMENDATIONS

Based on the findings, future *manasik* programs are encouraged to adopt a hybrid learning model that combines digital platforms like Satu Haji with direct mentorship to ensure both accuracy and spiritual integrity. The integration of digital applications should be accompanied by structured facilitation and contextual explanations, especially for elderly participants who may face limitations in using technology. Moreover, extending the scope of digital-assisted training to include other *hajj* rituals—such as *sa'i*, *wukuf*, and *tahallul*—would enrich the participants' overall readiness for pilgrimage.

For sustainability, collaboration between KBIHU institutions, the Ministry of Religious Affairs, and technology developers is highly recommended. Regular updates to the Satu Haji application, including improved accessibility features, voice guidance, and offline functionality, will make it more inclusive and effective. Future studies may also focus on longitudinal assessments to measure how digital learning impacts the actual *hajj* performance and post-pilgrimage spiritual outcomes, ensuring continuous innovation in faith-based education.

## ACKNOWLEDGMENT

The authors would like to express sincere gratitude to the administrators and mentors of KBIHU Armina, the Muhammadiyah Regional Board (PDM) of Sukoharjo, and the Muhammadiyah Hajj and Umrah Education Institute (LPHU) Sukoharjo for their valuable support, coordination, and facilitation throughout the implementation of the *manasik hajj* guidance program. Special thanks are also extended to all participating pilgrims for their active involvement and enthusiasm during the theoretical and practical *thawaf* sessions. The collective contributions, collaboration, and commitment of all parties greatly enhanced the smooth execution of this community engagement activity and the successful integration of religious learning with digital technology.

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