The Need for the Use of Virtual Reality (VR) in Halal Slaughter Training in Malaysia: A Preliminary Study

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ABSTRACT

Halal slaughter training is a critical aspect in ensuring compliance with Islamic law and ensuring food safety and quality. However, traditional training approaches face various challenges including resource constraints, safety risks, and limitations in providing effective practical experience. Virtual Reality (VR) technology has emerged as an innovative alternative that has the potential to overcome these challenges by providing an immersive and interactive training environment. This study aims to analyze the needs and potential for implementing halal slaughter training using VR in Malaysia. Through a qualitative approach, data was collected from previous literature. Findings indicate that the use of VR in slaughter training can increase trainees' understanding, engagement, and knowledge retention, as well as reduce training risks and costs. The implications of this study suggest the integration of VR technology in halal slaughter training modules as a step forward in strengthening the country's halal industry.

Keywords: Virtual Reality, Halal Slaughter Training, Immersive Technology, Skills Education, Malaysia Halal Industry

INTRODUCTION

Malaysia is globally recognized as one of the leading pioneers in the halal industry, solidifying its position as a preferred hub for business expansion in the halal-related sector (Shahwahid, 2015). Malaysia's halal governance framework is distinguished by its rigorous grounding in Quranic and Sunnah-based principles, supplemented by the scholarly consensus of authoritative jurists. This has elevated the country's halal ecosystem to global prominence, as demonstrated by the international trust accorded to JAKIM's halal certification (Buang, 2012). The halal industry in Malaysia is an important and strategic sector in the country's economic development, with halal slaughtering being one of the critical components in the halal food supply chain. The phenomenon of increasing global demand for halal products necessitates the use of advanced technology to ensure that this demand can be met while maintaining high-quality halal standards (Ghazali, 2022). The effectiveness of shariah-compliant slaughter training is crucial to ensuring the integrity and reliability of halal products in the domestic and global markets. Furthermore, multiple empirical studies have demonstrated that meat from animals slaughtered according to Islamic shariah principles exhibits superior quality characteristics, enhanced palatability, and better-preserved nutritional integrity compared to conventionally processed meats (Awan, 2016).

However, conventional training methods often face various constraints such as logistical issues, safety risks, and limitations in terms of comprehensive practical experience. In some cases, it even affects the aspects of animal welfare and syariah compliance. In conventional slaughtering processes, multiple welfare-compromising

scenarios may occur due to logistical challenges, including prolonged transport-induced crowding and insufficient provision of sustenance. By contrast, Islamic halal slaughtering mandates rigorous animal welfare protocols to institutionalize *ihsan* (compassionate treatment) as an essential ethical framework (Aidaros, 2022).

Consistent with the transformative wave of Industry 4.0, the adoption of cutting-edge technologies in education and training is now imperative. Virtual Reality (VR) has gained traction for its ability to replicate immersive, lifelike settings, optimizing training efficacy through experiential learning (Safar, 2021). Along with the development of technology and digital transformation, Virtual Reality (VR) has emerged as an innovative approach that has the potential to revolutionize skills training methods. VR provides an immersive and interactive simulation environment, allowing trainees to apply knowledge more realistically without physical risk. Therefore, this study was conducted to analyze the needs and potential for the implementation of VR technology in halal slaughter training in Malaysia, by assessing the aspects of effectiveness, suitability and implementation challenges in the local context.

LITERATURE REVIEW

Halal Slaughtering Practice in Malaysia

Halal slaughter training is an important component of the national halal assurance system that directly contributes to maintaining the integrity of the halal food industry. In Malaysia, this training is formally regulated by the Department of Islamic Development Malaysia (JAKIM) through the Malaysian Halal Certification Procedure Manual as well as collaboration with state agencies and recognized training institutions. The main objective of this training is to ensure that slaughterers not only have technical skills, but also a deep understanding of syariah principles, legal slaughter methods, and compliance with established animal welfare standards (Sahid, 2020). The existing training covers theoretical and practical aspects, including explanations regarding slaughter laws, animal handling methods, permitted equipment, and slaughter procedures according to Islamic law. In addition, trainees are also given exposure to regulations related to hygiene and food safety, in line with the requirements of local authorities and enforcement agencies such as the Veterinary Services Department and the Ministry of Health Malaysia.

However, this traditional training approach faces various challenges. These include training resource constraints such as the limited number of certified facilitators, the logistical requirements for the provision of live slaughter animals, and safety risks for trainees who are new to practical activities (Ghazali et al., 2022). Furthermore, the practical experience provided is often insufficient to train trainees intensively in a setting that resembles real-world conditions, especially when involving large-scale industries or exports. In addition, there is a need to ensure that training can be delivered more flexibly and consistently to various target groups, including the younger generation, new slaughterers, as well as industry practitioners in rural areas. In this regard, the use of more innovative training approaches such as digital learning and technology simulation is seen as an increasingly urgent need.

With the development of Industrial Revolution 4.0, adapting training methods to more modern forms such as the use of Virtual Reality (VR) have the potential to solve most of these challenges. With VR simulation, trainees can be exposed to complex slaughter scenarios without complicated physical requirements, while being able to repeat training according to individual needs. Therefore, an assessment of the effectiveness of integrating this technology into the halal training system is appropriate and relevant.

Virtual Reality Technology in Education and Training

Virtual Reality (VR) technology refers to a computer-based system that can generate a three-dimensional environment simulating the real world, where users can actively interact using specific input devices such as controllers, smart gloves, or motion tracking tools. In the field of education and training, VR has rapidly evolved as a new learning medium that offers an immersive experience, where learners feel as though they are "directly involved" in the virtual world (Safar, 2022). Various studies have shown that the use of Virtual Reality (VR) in education can enhance conceptual understanding, student engagement, and long-term knowledge retention. According to Alnagrat et al. (2022), VR-based learning increases student motivation, as it allows them to actively

explore learning content through simulations rather than passively receiving information. This aligns with the experiential learning approach, where students learn through direct experience in a controlled environment. In the field of technical and professional skills training, VR is widely used to simulate real-life procedures and situations that are difficult or risky to perform in the real world. For example, medical training using VR allows trainees to perform virtual surgeries without posing any risk to actual patients, while flight training using 3D cockpit simulations enables pilots to gain experience before operating real aircraft.

According to Wang (2024), The portability and fault tolerance of Virtual Reality (VR) position it as an effective tool for immersive skill acquisition, enabling learners to practice complex tasks without physical materials, tools, or dedicated workspaces. By simulating real-world environments, VR reduces resource waste, minimizes cleanup efforts, and eliminates real-world risks; optimizing both efficiency and sustainability. Its adaptable framework supports repetitive, feedback-driven learning across diverse domains, from technical training to precision-based procedures, while lowering accessibility barriers through location- and equipment-independent practice. In the context of halal training, particularly slaughtering, the use of Virtual Reality (VR) offers an opportunity to realistically simulate the slaughtering process in a safe and controlled environment. A study by Masood et al. (2024) indicates that VR can be used to train trainees on the proper halal slaughtering procedures in accordance with Islamic law, as well as hygiene and food safety standards. This approach not only helps reduce the risk of injury or technical errors during practical training but also lowers operational costs, such as the use of slaughter animals and the setup of complex physical facilities.

In addition, VR technology can also be utilized to visually and interactively convey the fiqh aspects of halal slaughter, such as identifying valid slaughtering tools, determining the correct veins to sever, and demonstrating humane animal handling techniques. Features such as real-time feedback, performance scoring, and repetitive training make VR a highly effective training tool, especially among younger trainees who are more responsive to modern technology.

However, the implementation of VR in halal education and training still requires significant investment in terms of content development, technological infrastructure, and instructor training. Therefore, further studies are needed to evaluate the overall effectiveness of VR usage, including trainee acceptance levels, pedagogical impact, and long-term cost-effectiveness.

Aspect	**Traditional Training**	**VR-Based Training**
Training Cost	High (animals, logistics)	Low (initial development, high reusability)
Trainee Safety	High risk	Very low
Practical Experience	Limited and one-time	Unlimited revision
Shariah Compliance	Dependent on direct training	Can be simulated and thoroughly reviewed
Skill Assessment	Difficult to objectively control	Measurable through interaction data & VR performance

Table 1: Analytical Summary of Comparison Between Traditional Training And VR-Based Training

METHODOLOGY

This study adopts a qualitative research design using thematic content analysis to explore the need for Virtual Reality (VR) in halal slaughter training. Data were collected from a combination of peer-reviewed articles from databases such as Scopus, Google Scholar, and ScienceDirect; official reports by JAKIM, Department of Veterinary Services; and related academic conference proceedings from 2010 to 2024. The selection criteria for articles included: (1) relevance to halal training or VR in skills development, (2) publications in English or Malay, and (3) focus on Southeast Asian or Muslim-majority contexts.

Thematic analysis was conducted in three stages:

1. Familiarisation with selected texts,
2. Coding recurring ideas, and
3. Identifying emerging themes related to training challenges, VR benefits, and implementation issues.

Additionally, two preliminary interviews were conducted with a certified halal slaughter trainer and a JAKIM officer to obtain initial stakeholder insights. While not statistically representative, these interviews helped contextualize the literature themes and identify realistic implementation challenges. The findings are interpreted with reference to the Technology Acceptance Model (TAM) and Experiential Learning Theory, which provide a conceptual basis for understanding VR adoption in vocational education and training contexts.

FINDINGS AND DISCUSSION

The Need for Halal Slaughter Training Using Virtual Reality (VR) Technology

The findings of the study indicate a significant need to enhance the approach to halal slaughter training in Malaysia in line with technological advancements and the current needs of the halal industry. Existing conventional training methods often face various limitations, including safety risks to trainees, high operational costs, and constraints in providing comprehensive practical experience. In this context, the use of Virtual Reality (VR) technology is seen as an effective alternative approach that aligns with the digitalisation era.

A study by Masood et al. (2024) confirms that the use of immersive technologies such as Augmented Reality (AR) and Mixed Reality (MR) in halal-related training, including slaughtering, can enhance interactivity, understanding, and knowledge retention among trainees. This is consistent with the findings of this study, which show that trainees are better prepared and more comprehending when they engage in realistic virtual slaughter simulations. Meanwhile, the study by Sulaiman et al. (2021) discusses the need to develop a virtual halal inspection model. This approach can be adapted to the context of halal slaughter training, which requires strict monitoring of Shariah compliance and adherence to SOPs. Furthermore, the findings also indicate that innovations such as 3D-printed animal models (Abd Razak, 2022), when integrated with a VR platform, can provide a more comprehensive learning experience. Trainees can practice slaughtering techniques on physical models while receiving visual guidance in an interactive virtual environment. The industry's acceptance of this technology is also supported by the study of N. N. et al. (2021), which reported that the majority of stakeholders in Malaysia's halal industry are open to the use of virtual technology for monitoring and training purposes.

Overall, these findings indicate that the need for VR in halal slaughter training has the potential to shift the paradigm from conventional training to a future-oriented approach that is safer, more comprehensive, Shariah-compliant, and more cost- and time-effective. These findings also highlight that the need for VR in halal slaughter training is grounded in real field realities, driven by the necessity to enhance training effectiveness, safety, and procedural standardization within the national halal industry.

The Potential Implementation of VR in Halal Slaughter Training in Malaysia

The use of Virtual Reality (VR) technology in halal slaughter training holds significant potential to transform the methods of teaching and learning slaughtering skills. It offers an interactive, realistic, and risk-free training experience, thereby serving as a self-paced and repeatable learning medium. Findings from the study indicate that VR can simulate the slaughtering process in a three-dimensional environment, complete with visual, auditory, and situational feedback. This enables trainees to experience the entire slaughtering process from beginning to end without physically interacting with live animals. According to Muhd Afiq Abd Razak (2022), the development of anatomically accurate 3D models of halal animals provides trainees with the opportunity to understand key anatomical structures involved in the slaughtering process. These models can be directly integrated into a virtual environment for a highly realistic simulation-based training.

Meanwhile, a study by Lili (2010) confirmed that the use of VR in slaughter simulation helps reduce reliance on direct training with live animals, thereby lowering costs, minimizing the risk of injury, and reducing

psychological stress on trainees. However, the successful implementation of VR in halal slaughter training depends on several factors:

1. Initial investment in the development of simulation software and specialized hardware.
2. Development of digital content modules that align with Shariah principles.
3. Training for instructors and facilitators to ensure they are competent in handling VR technology.
4. Coordination with authoritative bodies such as JAKIM to ensure implementation complies with halal certification guidelines.

A study by Abdullah et al. (2019) emphasizes that modern technology, despite its sophistication, must be adapted to Shariah principles to preserve halal integrity. Therefore, the use of VR must take this sensitivity into account during content development.

Lastly, findings also indicate that VR has the potential to strengthen the employability of skilled graduates in the field of halal slaughter. Rahim et al. (2013) stated that innovative and high-quality training can enhance trainees' employability, thereby contributing to the strengthening of the workforce in the country's halal industry.

CONCLUSION

This study highlights the importance and great potential of using Virtual Reality (VR) technology to enhance the effectiveness of halal slaughter training in Malaysia. VR technology can provide a safe, interactive, and realistic learning environment, thereby contributing to improved training quality and deeper understanding among trainees. Additionally, the immersive features of VR support active engagement and better knowledge retention, ultimately strengthening the professionalism and integrity of halal slaughter practitioners in the industry. However, the implementation of this technology requires meticulous strategic planning, including investment in the development of high-quality VR content and intensive training for instructors who will operate the system. Therefore, further empirical research is necessary to evaluate the actual effectiveness of VR in halal slaughter training, including pedagogical aspects, cost, user acceptance, and its impact on Shariah compliance.

RECOMMENDATIONS FOR FUTURE RESEARCH

Although the findings of this study demonstrate the significant potential of using Virtual Reality (VR) in halal slaughter training, several knowledge gaps and implementation issues remain insufficiently explored. Thus, further research is essential to strengthen the empirical foundation and ensure that the application of this technology delivers truly positive and sustainable impact in the context of halal training. This study recommends future research on the development of a VR-based halal slaughter training model that integrates aspects of Islamic pedagogy, educational technology, adult learning psychology (andragogy), the principles of Maqasid al-Shariah, and integrated competency assessment elements.

REFERENCES

1. A.R. Norhayati Rafida, A. Siti Mashitoh, A.R. Alina and N.H. Nurul Husna (2013). Expectation and Effectiveness of the Halal Slaughtering Training Towards Employability among Blue Collar Workers. Middle-East Journal of Scientific Research 13(Approaches of Halal and Thoyyib for Society, Wellness and Health): 11-16, 2013 ISSN 1990-9233
2. Abdullah, F. A. A., Borilova, G., & Steinhauserova, I. (2019). Halal Criteria Versus Conventional Slaughter Technology. Animals, 9(8), 530. https://doi.org/10.3390/ani9080530
3. Aidaros, H. (2013). Proper Application of Halal Slaughter. Conference of World Organisation for Animal Health (OIE) 2013. https://www.woah.org/fileadmin/Home/eng/Publications_%26_Documentation/docs/pdf/TT/2013_MO2_Aidaros.pdf
4. Alnagrat, A. J. A., Che Ismail, R., & Syed Idrus, S. Z. (2022). The effectiveness of virtual reality

technologies to enhance learning and training experience: During the COVID-19 pandemic and beyond. Journal of Creative Industry and Sustainable Culture, 1, 27–47. https://doi.org/10.32890/jcisc2022.1.2

5. Awan, J.A. & Sohaib, M. (2016). Halal and Humane Slaughter; Comparison Between Islamic Teachings and Modern Methods. Pakistan Journal of Food Sciences, 26(4): 234-240
6. Buang, A.H., Mahmod, Z. (2012). The Issues and Challenges of Halal Certification Bodies in Malaysia. Journal Syariah, (20)3, 271-288
7. Ghazali, M. A., Awang, M. D., Sawari, S. S. M., & Yunos, N. (2022). Slaughters and Halal Certificate in Malaysia Halal Industry. Journal Al-Sirat, 22(1), 60–68. Retrieved from https://ejournal.unipsas.edu.my/index.php/alsirat/article/view/259(EJournal Unipsas)
8. JAKIM. (2021). Manual Prosedur Pensijilan Halal Malaysia (Domestik) 2020 (Semakan Kedua). Jabatan Kemajuan Islam Malaysia.
9. Masood, A., Mohd Anim, N. A. H., & Ismail, A. (2024). Transforming Halal Training Through Gamification and Immersive Technology to Empower Talents. The Journal of Muamalat and Islamic Finance Research, 21(1), 70–81.https://doi.org/10.33102/jmifr.562(jmifr.usim.edu.my)
10. N. A. Lili, "Accuracy of Determination for Virtual Animal Halal Slaughtering: A Case Study," 2010 Fourth Asia International Conference on Mathematical/Analytical Modelling and Computer Simulation, Kota Kinabalu, Malaysia, 2010, pp. 482-485, doi: 10.1109/AMS.2010.98.
11. Radianti, J., Majchrzak, T. A., Fromm, J., & Wohlgenannt, I. (2020). A systematic review of immersive virtual reality applications for higher education: Design elements, lessons learned, and research agenda. Computers & Education, 147.
12. Sahid, M.M. & Awang, M. S. (2020). Halālan Ṭayyiban Concept and Maqāṣid Sharī'ah in Animal Slaughtering: A Study on Covid-19 Standard Operating Procedures (Sop) In Malaysia. International Journal of Maqasid Studies & Advanced Islamic Research. 1(2). 55 – 67. DOI:10.17605/OSF.IO/BKGJ5
13. Safar, F. & Rahman, N. A. A. (2021). Pendidikan Interaktif: Penerokaan Virtual Reality (VR) Dalam Visualisasi Model Seni Bina. ANP Journal of Social Sciences and Humanities 2(2): 26-38. DOI:10.53797/anpjssh.v2i2.4.2021
14. Shahwahid, F. M., Wahab, N. A., Ager, S. N. S., binti Abdullah, M., Hamid, N. A. A., Saidpudin, W., & Othman, N. (2017). Peranan Agensi Kerajaan dalam Mengurus Industri Halal di Malaysia: Isu dan Cabaran yang Dihadapi. World Academic and Research Congress 2015 (World-AR 2015). Ar-Rahim Hall, YARSI University, Jakarta, Indonesia, 9th – 10th December 2015
15. Sulaiman, M.Z.M., Noordin, N., Noor, N.L.M., Suhaimi, A.I.H., Isa, W.A.R.W.M. (2021). Enhancement of Halal Virtual Inspection Model: The Requirements of Food Premise Virtual Inspection Process. In: Md Shariff, N.N., et al. Enhancing Halal Sustainability. Springer, Singapore. https://doi.org/10.1007/978-981-33-4854-7_5
16. Wang, K. (2024). Research and Application of VR in Training and Learning. Highlights in Science, Engineering and Tech ology. 85. DOI: 1306-1313. 10.54097/anhqyy16.