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Bridging the Digital Divide: Evaluating Changes in Interest in Information Technology among Tahfiz Students

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ABSTRACT

The purpose of this study is to explore the influence of an introductory Information Technology (IT) workshop on Tahfiz students' perceptions and interests in digital literacy. Students in the Tahfiz education system often have limited exposure to formal technical training due to their routine focusing on religious and Quranic studies. Quantitative research has been employed involving a cohort of Tahfiz students who participated in a comprehensive IT workshop aimed at determining whether a structured intervention could bridge this gap and foster a more positive outlook toward technology. To measure the effectiveness of the programme, a pre-test and post-test were administered to evaluate the students' perceptions before and after the intervention. Results from a paired t-test analysis indicated a significant difference (p-value < 0.001) between the pre-workshop and post-workshop scores. The results revealed that the workshop successfully shifted the students' perspectives, leading to increased confidence and a more favourable view of IT as a tool for both personal and educational development. Therefore, the findings suggest that exposure to IT training is crucial for the holistic development of Tahfiz students in the modern era. By providing early and positive technical experiences, educational stakeholders can empower these students to integrate religious knowledge into digital proficiency, ensuring they remain competitive in an increasingly technology-driven environment.

1. INTRODUCTION

Nowadays, IT proficiency has been widely viewed as a crucial skill for learners in the current digital era since it facilitates efficient information access, communication, and adaptation to changing academic and professional demands, which likewise includes Tahfiz institutions. In recent years, many researchers have started to explore how technology can be integrated into faith-based education, particularly Tahfiz and Islamic education (Mohamed Salleh et al., 2025; Ismail et al., 2025). Tahfiz education has historically relied

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on techniques like *musyafahah* (face-to-face oral transmission) and *talaqqi* (direct teacher-student recitation) in Qur'anic memorisation. While these approaches remain important, modern educational demands and the growing digital nature of society essentially highlight the need for Tahfiz students to develop additional skills, including IT and digital literacy.

A study by Mohamed Salleh et al. (2025) which is in line with that of Ismail et al. (2025), highlights the proper use of digital tools, such as mobile applications and interactive media, for helping students improve their learning of the Qur'an through visualisation, repetition, and self-directed study, while complementing traditional methods like *talaqqi*. Previous studies by Hashim and Langgulung (2008), Hidayat et al. (2022) and Abdullah (2021) collectively suggest that Islamic education must adapt to contemporary developments while preserving its core values. Their findings indicate that technology can support teaching and learning accompanied by appropriate pedagogical practices, institutional support, and educator readiness.

Curriculum initiatives such as the Tahfiz Model Ulul Albab (TMUA) programme in Malaysia reflect efforts to balance mainstream academic competencies with religious education. Nevertheless, challenges remain in implementing technology-assisted pedagogy, particularly in providing systematic IT training for teachers and students (Haron et al., 2020). Based on studies in rural and Tahfiz contexts, targeted digital skill training can improve students' self-concept and learning outcomes (Ramli et al., 2024; Syed Hamid & Sueb, 2025). Complementary research on curriculum and digital literacy in Malaysia suggests that national initiatives aim to strengthen digital readiness and reduce educational disparities (Basri Mohd Zaid et al., 2024).

From this perspective, effective digital skill development depends not only on access to technology but also on structured instructional design, active engagement, and teachers' pedagogical preparedness. Therefore, this study aims to evaluate the impact of an introductory IT workshop on Tahfiz students' perceptions, specifically whether exposure to basic digital skills can influence their views on technology and its relevance to their educational journey.

2. LITERATURE REVIEW

Although interest in digital technologies within religious education continues to grow, existing studies have largely focused on memorisation practices, student performance and study strategies in TMUA contexts (Ambo & Mokhsein, 2019; Kaimin et al., 2025). Consequently, limited attention has been given to examining how digital technologies can effectively support teaching and learning processes in TMUA settings, particularly in balancing traditional oral instruction with emerging digital approaches. Studies on teacher readiness in the TMUA context indicate that effective implementation of 21st-century learning requires not only technology awareness but also sufficient pedagogical knowledge and continuous support (Muhamad Isa et al., 2025). In Islamic education, ICT (Information and Communication Technology) integration has been shown to enhance student engagement and learning outcomes; however, several challenges persist, including limitations in instructional design, accessibility, and professional development opportunities (Muflikhatun et al., 2025). Although technology is generally viewed positively, actual ICT usage and readiness levels among educators and learners remain moderate, hence suggesting the need to strengthen digital competencies and promote meaningful adoption (Yahaya et al., 2025).

Students' attitudes toward technology also play an important role in shaping learning motivation, confidence and educational outcomes (Getenet et al., 2024; Courtney et al., 2022). Positive attitudes toward digital tools are associated with higher participation, self-efficacy, and readiness to participate in technology-supported environments (Courtney et al., 2022). In line with the Technology Acceptance Model (TAM), students are more motivated when they perceive technology as useful and easy to use (Hashim & Thomas, 2023). TAM highlights that learners tend to accept digital tools when they are considered practical and user-friendly (Davis, 1989). Furthermore, Getenet et al. (2024) indicated that positive attitude and high confidence levels influence students' motivation in technology acceptance. Zoa et al. (2025) have shown

that ICT integration improves educational outcomes in early childhood and primary education, depending on factors such as intervention duration and application type.

Research across various educational contexts has shown that participation in targeted digital skills programmes can enhance students' digital literacy, problem-solving skills, and learning engagement. Furthermore, structured hands-on workshops with guided practice positively contribute to students' digital skill development. Findings from qualitative studies and scoping reviews also highlight active involvement in technology-based tasks as an important factor in developing digital literacy (Chan & Sung, 2025; Sormunen et al., 2021). Interactive workshops are widely used to build positive attitudes, motivation, and confidence in technology use by promoting collaborative and hands-on learning experiences. According to Letchmanan and Saad (2021), these approaches enhance students' participation, self-confidence, and practical skills, consistent with Chan and Sung (2025).

Despite extensive evidence on the benefits of technology in education, limited research has focused on Tahfiz contexts, particularly using pre- and post-intervention designs. Existing studies have shown that digital tools can enhance engagement and support learning outcomes in Qur'anic education while complementing traditional teaching methods (Ismail et al., 2025; Mohamed Salleh et al., 2025). However, further intervention-based research is needed to better understand how structured IT programmes can enhance Tahfiz students' interest in IT and further support digital skill development.

Although previous studies have widely examined ICT integration, technology readiness, and digital learning, limited attention has been given to Tahfiz or faith-based students, particularly regarding their interest in IT. Existing research has largely focused on mainstream school environments, teachers' readiness, or general perceptions of technology use (Hew & Brush, 2007; Tondeur et al., 2017). For instance, Hew and Brush (2007) highlighted that most ICT studies concentrate on barriers and integration issues in conventional classroom settings, with less attention being given to specific learner groups or contexts. Similarly, Tondeur et al. (2017) highlighted that existing research has primarily focused on teachers' beliefs and institutional factors, yet comparatively less attention has been given to students' experiences across diverse educational contexts. Moreover, in the context of religious education, existing studies remain relatively limited and are often descriptive in nature, with fewer studies employing intervention-based approaches to examine changes in students' behavioural or attitudinal outcomes (Hashim & Langgulung, 2008).

Consequently, little is known about how students in religious-based institutions, such as Tahfiz schools, respond to structured IT exposure. Given the distinctive nature of Tahfiz education, where emphasis is placed on religious studies and traditional pedagogies, understanding students' responses to technology-related interventions is important. Therefore, the present study addresses this gap by examining whether participation in an IT awareness workshop can influence Tahfiz students' interest in IT.

3. METHOD

This study employed a one-group pre-test and post-test design to examine changes in Tahfiz students' interest in IT following participation in an IT awareness workshop. The study was conducted as part of the IT4TAHFIZ programme held on 19 July 2025 at Madrasah Istiqamah Paya Pulai, Temerloh, Pahang, in collaboration with the Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA (UiTM) Pahang. A total of 36 registered secondary level students from the madrasah attended the workshop and participated in the study. Participants consisted of 21 female students (58.3%) and 15 male students (41.7%) aged between 15 and 17 years. Of these, 25 students (69.4%) were in their third and fourth year of study at the institution. Ethical considerations were observed throughout the study, and approval was obtained from the school administration prior to data collection. Participation in this study was also voluntary, and informed consent was obtained from all participants. Participants were assured of the confidentiality and anonymity of their responses, and all data were used solely for research purposes.

The intervention involved a three-hour IT awareness workshop facilitated by an IT expert from the Faculty of Computer and Mathematical Sciences, UiTM Pahang. The programme aimed to provide early exposure to IT and its relevance to education, career opportunities, and digital development. In addition, the workshop emphasised the importance of technological literacy in contemporary society while highlighting the complementarity between technological advancement and religious education. This session included introductory exposure to basic computer literacy and software applications, supported by guided interactive learning activities designed to foster active involvement in the learning process.

Data were collected using a structured questionnaire consisting of two sections. The first section comprised six items measuring participants' overall satisfaction with the programme, while the second section consisted of seven items measuring participants' interest in IT, including their interest in learning IT, exploring IT independently and collaboratively, and their willingness to share IT knowledge with others. All items were rated using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The instrument was developed based on relevant literature on students' interest in IT and was reviewed for content relevance to ensure alignment with the research objectives. A reliability analysis was conducted to assess the internal consistency of the instrument. The reliability of the constructed instrument was measured during the pilot study, and the Cronbach's alpha coefficients were calculated for each section. The results showed that the overall satisfaction section had a Cronbach's alpha reliability coefficient of 0.854 while the interest section recorded a Cronbach's alpha reliability coefficient of 0.881. According to Taber (2018), stronger reliability is indicated by values near 1.0, where a Cronbach's Alpha value of 0.7 or greater is deemed satisfactory. Since this is an exploratory study with a relatively small sample size, construct validity was not examined, as stable factor solutions typically require larger and more robust samples (MacCallum et al., 2001; Tabachnick & Fidell, 2019). Instead, internal consistency was assessed by separating the questionnaire into conceptually distinct subscales and calculating individual Cronbach's alpha values for each, in line with the fundamental assumption that Cronbach's alpha should be applied to unidimensional sets of items (Cortina, 1993; Sijtsma, 2009; Tavakol & Dennick, 2011). Therefore, the Cronbach's alpha values indicated that the instruments were sufficiently reliable for use in this study.

The responses of the participants, which provide an overall evaluation of the workshop, were analysed using frequency analysis. Meanwhile, data on interest in IT were collected via pre- and post-test surveys measuring the participants' interest, attitudes, and perceived importance of IT. Data were then analysed using a paired *t*-test to compare the mean scores before and after the intervention, testing for statistical significance. The Statistical Package for Social Sciences (SPSS) software was used to perform all analyses.

4. FINDING & DISCUSSION

The IT workshop conducted revealed that the participants responded with positive feedback with mean scores ranging from 3.61 to 4.08, as shown in Table 1, which reflects generally high agreement levels. Most participants at least agreed that they understood the information delivered by the speaker very well (63.9%), and that interesting content had been delivered (77.8%). Table 1 also shows that the participants had more interest in and a better understanding of IT after joining the workshop (M = 3.75). The highest mean score was recorded for the item stating that participants were happy to gain knowledge related to IT through the workshop (M = 4.08), with 80.6% agreeing or strongly agreeing. Overall, the mean scores based on the IT workshop satisfaction evaluation showed that students were highly satisfied with the workshop.

Table 1. IT Workshop Satisfaction Evaluation Mean Scores

Item	Mean (M)
I was able to understand all information delivered by the speaker regarding the field of Information Technology (IT) well.	3.72
All information delivered regarding the field of Information Technology (IT) was very interesting.	3.97

The speaker delivered the information regarding the field of Information Technology (IT) effectively.	4.03
The facilitators provided a great deal of assistance to me throughout the programme.	3.61
I became more interested in and gained a better understanding of the field of Information Technology (IT) after participating in this programme.	3.75
I was very happy to gain a lot of knowledge related to the field of Information Technology (IT) by participating in this programme.	4.08

The high level of satisfaction reported in the results may be attributed to the structured and interactive nature of the workshop, which had likely enhanced students' engagement and comprehension. In the context of Tahfiz education, where instruction is often content-focused and traditionally delivered, the incorporation of hands-on and guided IT activities may provide a novel and meaningful educational experience. This supports the notion that active participation and contextualized learning can improve students' perceived usefulness of technology, which is a key construct in the TAM (Davis, 1989).

This study also focuses on participants' preference and interest level towards IT. Table 2 shows the comparative results based on participants' preference to explore IT according to three different categories: self-explored, together with family members, or with others including friends. In total, the percentage of participants who self-explored increased from 41.7% to 55.6% indicating greater confidence and preference in exploring IT independently. In addition, there was a notable increase in the agreement level categories from 19.4% to 41.7% after exploring IT with family members and an increment from 44.4% to 61.1% when exploring IT with others. The results showed that participants felt more comfortable exploring IT with friends or others, hence suggesting that peers play a positive role in increasing interest in IT.

Table 2. Interest in Information Technology (IT) Exploration

Category	Indicator	Before		After	
		Frequency	%	Frequency	%
Self-exploration	Strongly Disagree	2	5.6	2	5.6
	Disagree	6	16.7	5	13.9
	Neutral	13	36.1	9	25.0
	Agree	13	36.1	15	41.7
	Strongly agree	2	5.6	5	13.9
Family	Strongly Disagree	3	8.3	2	5.6
	Disagree	11	30.6	6	16.7
	Neutral	15	41.7	13	36.1
	Agree	7	19.4	14	38.9
	Strongly agree	0	0	1	2.8
Friends and others	Strongly Disagree	3	8.3	0	0
	Disagree	2	5.6	2	5.6
	Neutral	15	41.7	12	33.3
	Agree	12	33.3	16	44.4
	Strongly agree	4	11.1	6	16.7

This pattern may indicate the importance of social interaction in technology adoption, particularly among learners with limited prior exposure such as Tahfiz students. Peer support and collaborative exploration can enhance perceived ease of use, which is another central element of TAM, as learners rely on shared knowledge and mutual assistance. Therefore, in the Tahfiz context, where communal learning is already embedded in daily practices, integrating collaborative digital activities may further strengthen students' engagement with technology and reduce apprehension toward its use.

Overall, participants' interest in IT was identified and summarised before and after the workshop (Table 3 and Figure 1). The study found that more than half (20, 55.6%) of the participants initially responded at

most to a neutral level of interest in IT, while the remaining 16 participants (44.4%) at least agreed that they were interested in IT. Meanwhile, the percentage of participants who at least agreed increased by 11 participants to a total of 27 (75.0%) after the workshop. Notably, no students reported disagreement after the programme. This shift suggests that the intervention not only increased interest but also reduced negative perceptions toward IT, which is particularly significant for learners in underserved educational settings.

Table 3. Interest in Information Technology (IT)

Indicator	Before		After	
	Frequency	%	Frequency	%
Strongly Disagree	0	0	0	0
Disagree	2	5.6	0	0
Neutral	18	50.0	9	25.0
Agree	12	33.3	21	58.3
Strongly agree	4	11.1	6	16.7

Preliminary analysis revealed that the requirement of normality for a paired *t*-test was satisfied. The skewness and kurtosis levels were within the acceptable range of -2.0 to 2.0, confirming that the data were approximately normal.

Table 4. Paired *t*-Test Analysis

Variable	*p*-value	Mean difference	Standard error mean difference	95% Confidence interval of the difference	
				Lower	Upper
Before ~ After	.000	-0.357	0.0750	-0.5093	-0.2050

Results from the paired sample t-test in Table 4 show the mean scores before (M = 3.2937, SD = 0.6278) and after (M = 3.6508, SD = 0.5382) participation in the IT workshop. The increment of 0.3571 points indicates that more participants agreed that the IT workshop positively influenced their perception and interest in IT. The paired sample *t*-test was conducted to signify a significant difference in participants' interest level before and after the IT workshop. The results revealed a *p*-value of 0.001 (*t*-value (35) = -4.764, *p*-value < 0.001), indicating statistically significant differences between mean scores obtained before and after the workshop. Therefore, it can be concluded that the participants' interest in IT has improved after attending the workshop, which can be interpreted as strong evidence that structured exposure to technology, even within a short intervention, can meaningfully influence learners' attitudes and motivation. In line with digital inclusion perspectives, this finding highlights the potential of targeted interventions in bridging the technological gap among students in religious and underserved educational settings (Van Dijk, 2020).

These results are supported by Letchmanan and Saad (2021), who stated that an interactive workshop helps students enhance positive attitudes towards technology as reflected in the significant difference between the pre- and post-survey results. The findings consistently show that structured and guided IT activities are effective in improving students' digital knowledge, technical skills, and confidence, especially when learning is centred on active practice and real-life application rather than passive instruction. In addition, Zoa et al. (2025) asserted that ICT generally improves academic performance outcomes in early childhood and primary education, particularly in language and subject knowledge, with the strength of the effect being influenced by factors such as intervention duration and application type. The current results also align with Getenet et al.'s (2024) assertion that students' attitudes and self-confidence in using digital technologies significantly influence their motivation and involvement in technology-supported educational environments. Collectively, these findings suggest that the integration of IT within Tahfiz education is not only feasible but also beneficial in enhancing students' engagement, confidence, and readiness for digital education, thereby contributing to the broader discourse on the modernisation of religious education.

5. CONCLUSION

The findings suggest that the IT workshop was successful in delivering engaging and understandable IT-related content, as well as in enhancing participants' interest, understanding, and overall satisfaction. From the overall research findings, it can be concluded that short-term, intensive IT interventions are effective in breaking down barriers and misconceptions regarding technology within the Tahfiz education system. Providing Tahfiz students with technical exposure helps bridge the digital divide between religious education and modern technological requirements. Therefore, it is recommended that Tahfiz institutions integrate basic IT literacy modules into their core curriculum. Furthermore, future workshops should be extended in duration based on certain progression such as beginner, intermediate and advanced levels to ensure that the initial positive perception could be translated into long-term technical proficiency.

From a theoretical perspective, this study contributes to the Technology Acceptance Model (TAM) by providing empirical evidence that structured and contextually relevant IT interventions can enhance both perceived usefulness and perceived ease of use among students in religious education settings. The findings suggest that when technology is introduced through guided, hands-on experiences, learners are more likely to develop positive attitudes and increased acceptance toward its use, even in environments with limited prior exposure to digital tools. However, several limitations should be acknowledged. First, the study involved a relatively small sample size from a single Tahfiz institution, which may limit the generalisability of the findings to other contexts. Second, the short duration of the intervention restricts the ability to examine long-term retention of knowledge and sustained interest in IT. Additionally, the reliance on self-reported measures may introduce response bias, as participants may provide socially desirable answers following the workshop.

Future research may involve a larger and more diverse sample across multiple Tahfiz institutions to enhance the robustness of the findings. Longitudinal studies are needed to investigate whether improvements in interest and perception can be sustained over time and translated into actual technological competencies. Future research may also explore the integration of more advanced digital tools and pedagogical approaches to better understand their impact on students' learning outcomes in religious education settings. While the findings provide promising insights, they should be interpreted with caution. The results may be most applicable to similar educational environments with comparable student backgrounds and levels of prior exposure to technology. Therefore, further empirical evidence is required before broader generalisations can be made across different types of religious or mainstream educational institutions.

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7. CONFLICT OF INTEREST STATEMENT

The authors agree that this research was conducted in the absence of any self-benefits, commercial or financial conflicts and the authors declare the absence of conflicting interests with the funders.

8. AUTHORS' CONTRIBUTIONS

Sharifah Norhuda Syed Wahid: Manuscript preparation, data validation, data analysis and discussion; **Yusharina Yusof:** Introduction, literature review and overall coordination of the research process; **Fadila Amira Razali:** Data analysis; **Noor Izyan Mohamad Adnan:** Data collection and validation; **Nurmarni Athirah Abdul Wahid:** Discussion and conclusion. All authors read and approved the final version of the manuscript.

9. DECLARATION OF THE USE OF GENERATIVE AI

This manuscript was prepared with the assistance of Gemini to improve overall clarity, grammar, and readability. The tool supported the author(s) in reviewing and refining the content, and the author(s) assume full responsibility for the final published version.

10. DATA AVAILABILITY/ SUPPLEMENTARY MATERIALS

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

11. ETHICS STATEMENT

Informed consent was obtained from all participants, and data anonymity was strictly maintained throughout the study.

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