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The Application of Qr Codes at Selected Malacca Heritage Mosques for Interactive Educational Tourism

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ABSTRACT

Educational Tourism in heritage mosques is a form of tourism activity that emphasizes educational content to fulfill tourists' experiences and knowledge in heritage buildings, while interactive educational tourism is a form of approach using tourism activities, programs, historical, architectural, and cultural traits. However, interactive multimedia and technology features do not fully engage with the Malacca heritage mosques for interactive educational tourism, as tourists need to rely on printed materials, word-of-mouth by locals, or reviews from travel websites. These limited sources and non-updated information resulted in tourists being dissatisfied with the visits, hence not achieving their learning experiences, and less promoting of interactive educational tourism. Therefore, this study aims to introduce the use of QR Codes linked to online information websites at selected Malacca heritage mosques to improve tourists' learning experiences in historical and cultural heritage attributes and promote interactive educational tourism at heritage buildings. For this research, a mixed-method approach of questionnaire survey and semi-structured interview is used. and distributed using online and on-site approaches and the result of 350 surveys indicates that 44.9% of tourists agreed QR Codes can be used to access information about selected Malacca heritage mosques. 44.9% of tourists also agreed that QR Codes are viewed as a medium to access the content and as a 'gateway' to interactive educational tourism using digital applications. This is also agreed by the interviewees that QR Codes help tourists access information on selected Malacca heritage mosques through interactive websites that display updated and consistent content regarding the historical and cultural attributes of the heritage mosques. The study's contribution lies in the effectiveness of using QR Codes as a platform to disseminate information about heritage buildings through interactive multimedia and updated sources on websites. This approach has been shown to increase tourists' interest in using QR Codes, as evidenced by the feedback surveys and interview sessions. Recent studies and tourists' survey feedback indicate that this approach enhances tourists' information retrieval by providing easy access to interactive and updated content through QR Codes. This improvement facilitates experiential learning, personalized experiences, enriched visual engagement, and increased motivation for tourists to revisit the places.

Keywords:

QR Codes; interactive educational tourism; selected Malacca heritage mosques

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1. Introduction

Information and Communication Technology (ICT) has expanded to tourism products and services. The use of digital platforms in creating interactive content can become an effective educational tool to disseminate information to tourists and to attract tourists to learn and explore tourist places [1]. For example, 360° panoramic images, interactive videos, and audio presentations enrich knowledge and deliver valuable and memorable experiences to tourists. Besides that, online platforms such as interactive websites, virtual tours, and social media content offer comprehensive accessibility and encourage tourists to explore tourism product treasures. These digital platforms provide a richer and more engaging as they allow tourists to interact, which could significantly enhance the educational experience for tourists, and create enjoyable and impactful discovery.

The utilization of digital platforms is pivotal in promoting interactive educational tourism and reaching global audiences [2]. In cultural heritage tourism, the integration of technology with heritage buildings allows tourists to obtain information on historical and cultural heritage attributes. For example, interactive websites, and virtual tours allow tourists to access in-depth information about its history, significance architecture, and cultural characteristics, while interactive maps and trails give tourists a richer, more engaging experience, and learning process [3, 4]. The key feature in producing interactive content is to have information that presents significant and reliable information about the history, culture, and heritage characteristics of the buildings with various sources available that contribute to novelty and knowledge-seeking factors when visiting the buildings.

Malacca is one of the remarkable examples of historic colonial towns that demonstrate a succession of historical and cultural influences. Due to its diverse multicultural heritage and tradition, Malacca records 5.12 million tourist arrivals between January and April 2024 in conjunction with the Visit Melaka Year 2024 [5]. Malacca's UNESCO recognition has significantly boosted its tourism sector with a rise in tourist arrivals of more than 6 million tourists in 2022. Besides historical monuments such as the A'Famosa, The Stadthuis, and The Dutch Square, Malacca also has promising heritage mosques that showcase diverse history and cultural characteristics.

Parallel to the rising interest in mosque tourism and recognition of Malacca city as a World Heritage Site, Malacca heritage mosques became one of the tourist attractions that showcased the historical and cultural heritage characteristics that differed from other regions. However, these mosques have not been well presented and highlighted in the tourism promotion, hence reducing tourists visiting the mosque [6]. The limited sources and non-updated information on Malacca heritage mosques cause tourists to rely on word-of-mouth and reviews from travel websites such as TripAdvisor or travel blogs. This may dissatisfy tourists not achieving their motivation to learn on-site and reduce their interest in discovering the cultural heritage characteristics of the mosque. In addition, a study by Rahim *et al.*, [7] also revealed that issues in promoting heritage mosques for tourists' learning perspectives are increased due to limited publication and information on the tourism package. The use of digital and printed materials is also scarce in the context of displaying information about the mosque and only depends on the existing data which may lead to the disappearance of documentation and features of Malacca heritage mosques.

Besides that, Malacca heritage mosques also face a challenge where there is a lack of commercialization in the heritage mosque tourism industry [8]. According to the Ministry of Tourism, Arts, and Culture (MOTAC), heritage mosques are one of the Mosque Tourism projects that aim as a platform for cross-cultural understanding and Islamic practices for non-Muslim tourists [9]. However, there is a constraint of commercialization on promoting Malacca heritage mosques, resulting in tourists unrecognized the heritage mosques leading to ignorance towards the religious buildings [8].

Therefore, this study aims to determine the relevance of using QR Codes to access information at selected Malacca heritage mosques. With the QR Codes utilized in Malacca heritage mosques, tourists can scan the code and directly link to the websites containing information about the mosque including its history, and the mosque's style, or link to the mosque's websites or social media platforms that display the programs and activities conducted at the mosque. In line with Malacca Strategic Plan 2035 empowers smart applications and digital content in tourist places, QR Codes are regarded as a potential approach that benefits tourists in the context of learning experience while promoting interactive educational tourism in religious buildings [10]. The application of QR Codes in selected Malacca heritage mosques could push the tourism industry to change from traditional learning practice to advanced learning using ICT applications. As a result, this approach will broaden the positive perspective while showcasing the richness of history and cultural heritage exploration to tourists.

1.1 Mosque Tourism and Interactive Edu-tourism

According to Moghavemi *et al.*, [11] mosque tourism in Malaysia was initially developed during the national roundtable conference of Imams in the year 2016 between the Department of Islamic Development Malaysia (JAKIM) and the Islamic Tourism Center (ITC) aimed to promote Islam globally under the niche area of Islamic Tourism. Malaysia mosques are presented as tourist attractions that allow tourists to experience the architecture and cultural traits through the mosque's design and community activities This is supported by Abdul Razak [6] describing that the mosque is not only viewed as a place of worship but also a center of learning the history and cultural attributes that can fulfill tourists needs in understanding Islam and Islamic principle.

For non-Muslim tourists, mosque tourism offers a vibrant feeling of what is like to be in another sacred place which they have not usually experienced before. It generates cultural and educational opportunities for non-Muslim tourists to gain an in-depth understanding of Islam from both cultural and religious perspectives.

Educational tourism is one of the tourism segments that pursue learning opportunities in the context of the historical, cultural, ecological, and social lifestyle of the place to provide a life-long learning experience among tourists [12]. A theoretical framework of educational tourism by Ritchie [13] highlighted the primary educational tourism product, resource base, and destination impact are the key features to promote educational travel to tourists. Figure 1 presents the theoretical framework of Educational Tourism.

According to Figure 1, Ritchie [13] highlights travel behavior and motivation as the factors that contribute to the educational tourist experience. The factors known as the push-pull motivational factors are identified as a central parameter that gives insight into tourists' needs and demands that lead to travel behaviors, destination attributes, and tourist activities. The factor also includes an interest in cultural heritage and the history of the place that has possibly become prominent criteria of tourist motivation.

The landscape of educational tourism has evolved and focused on (i) experiential learning that offers richer and more memorable educational experiences, (ii) cultural immersion that encourages tourists to engage with cultural activities, and (iii) interactive applications that offer virtual tours, and historical information. Interactive learning experience using ICTs allows tourists to actively volunteer and connect with the history, culture, and surroundings as it offers practical experiences and self-directed learning [4] The notion is also supported by Ott and Pozzi [14] mentioning that ICTs offer a vibrant learning environment that contributes to 'opening' the doors of communication, sharing information, and favoring knowledge between tourists and communities

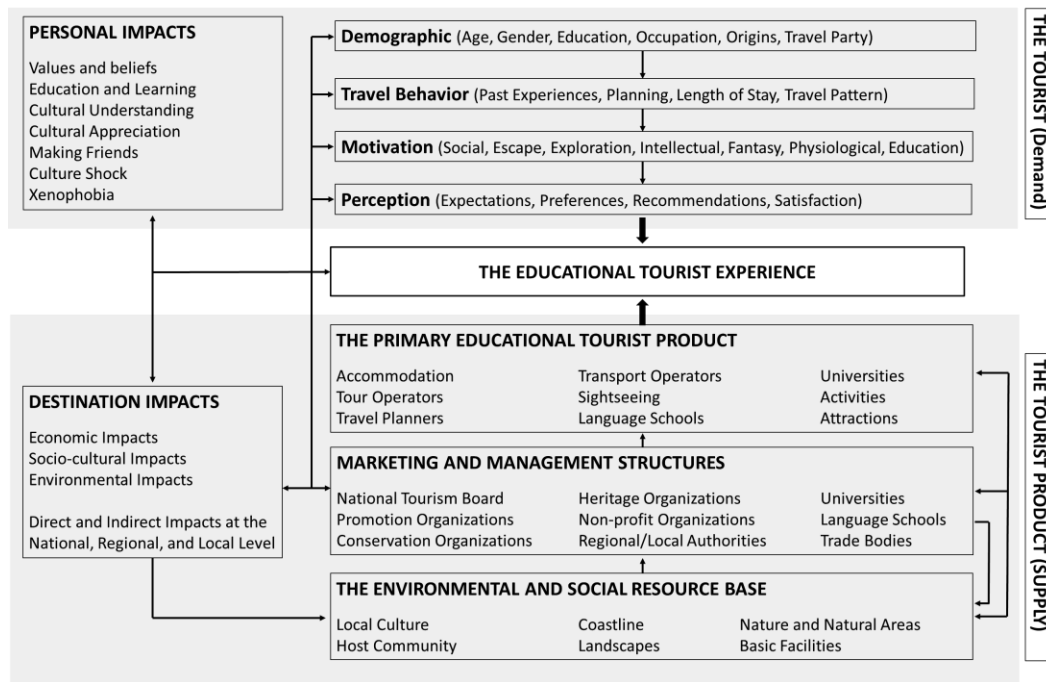


Fig. 1. Theoretical framework of educational tourism [13]

1.2 ICTs in Educational Tourism

The Malaysian tourism sector has found a potential approach to using digital technology to promote effective and convenient learning experiences [15]. According to Avci and Akyol [2], the use of digital applications in creating interactive content not only disseminates information to tourists but also promotes an interactive learning ambiance and reaches global audiences. For example, 360° panoramic images, video presentations, and interactive websites offer comprehensive accessibility and encourage tourists to explore tourism treasures, consequently enriching knowledge and delivering meaningful experiences. In addition, Dan *et al.*, [16] mentioned that ICT can mediate both behavioral and psychological dimensions of the touristic experience by facilitating information, interacting with communities, and planning tourist activities, resulting in satisfaction and regulating their personal experience using digital platforms. Thus, using digital platforms to create an interactive educational basis in the tourism industry can be an effective application to attract tourists to learn and explore tourist places.

In cultural heritage tourism, the use of ICTs can improve the learning opportunities for tourists participating in heritage places. Virtual tours, multimedia exhibitions, and visual historical information allow tourists to discover the heritage places and bring a novelty factor that motivates tourists to revisit the places and draw connections between various aspects of the heritage [3]. Besides tourist places, digital technologies can be used to promote cultural festivals, local performances, heritage events, and entertainment through digital storytelling platforms, and interactive cultural games [2].

The inclusion of cultural activities through digital technologies fosters a sense of discovery and encourages independence and critical thinking while enticing tourists to actively engage with the intangible attributes of the place. Consequently, interactive educational tourism delivers an enriching experience that goes beyond the typical exploration as it incorporates learning as part of the experience.

1.3 Digital Technology in Cultural Heritage Tourism

The continuous use of digital technology in tourism sectors shows an enormous potential for tourists as this technology offers immersive visitor experiences, promotes the attractiveness of the place, and provides detailed information about the place with tourism activities [17]. For example, QR Codes provide accessible resources by scanning the code and directly linking to the digital content, while Augmented Reality (AR) delivers the visualization of the place so that tourists can learn about the heritage of the place they are visiting.

Research on heritage buildings has shown that digitization in the conservation of heritage buildings is pivotal in providing updatable documentation and information for tourists [18]. The technology offers a huge potential to become an effective tool for disseminating information to tourists as well as preserving architectural and cultural heritage. According to Baharuddin *et al.*, [18], 3D modeling has become increasingly popular in documenting and interpreting archaeological and cultural heritage context. This model provides an innovative method for presenting information and facilitating virtual tours of heritage buildings. Besides 3D modeling, Cultural Heritage (CH) documentation with technological advances provides a complexity of information resources through digital representation and graphic documentation that may enhance the tourists' experience in heritage sites.

In the context of learning experiences, the newest technology trend, Artificial Intelligence (AI) can be used to improve virtual tours in cultural and heritage tourism through high-resolution visual and audio quality [19]. According to the study by Han *et al.*, [20], VR and AR have been used in many cultural tourism sites to engage tourists with re-live historical sites, and events, engage with the content of the destinations, and virtual tours, which affect the overall learning experiences and linked to their motivations and intentions. Further view, Hashim *et al.*, [19] mentioned that AI-generated with VR or AR enables tourists to back in time and witness the historical events or reconstruction of the historical buildings, thus making the experience more memorable and impactful. Other than that, generative AI can be used digitally to reconstruct and preserve the lost artifacts or elements of the buildings which allows tourists to gain a deeper understanding of the historical context and foster a connection to the past events.

Hashim *et al.*, [21] also described the use of digital technologies provide an immersive learning experience and significantly increasing people's motivation and engagement. The study mentioned that multimedia representation technology using Augmented Reality (AR) and Virtual Reality (VR) creates a positive impact on tourists' learning experiences, especially children as this technology improves their creativity and emotional intelligence on the cultural heritage sites. Moreover, the development of virtual reality (VR) and augmented reality (AR) fosters creativity among learners and shapes educational tourism through interactive, entertaining, and experiential learning that appeals to various tourist activities and preferences.

1.4 QR Codes in Mosque Tourism

QR Codes have been used widely in many tourism products such as facilities, services, and entertainment. The use of technology as a promoter of tourism services has improved time, money, and information efficiency Huang *et al.*, [22] mentioned that QR Codes have helped tourists by providing necessary collaborative information and mobile travel platforms for traveling assistance. The application itself is ideal for a dynamic, and interactive educational basis while promoting the tourism product, services, and facilities.

In the Mosque Tourism industry, QR Codes are viewed as a digital platform that helps tourists access the information of the mosque. By scanning the code, tourists visually capture the information readily available from the data materials highlighting the historical and cultural characteristics of mosques. By integrating data with educational information, the QR Codes provide a platform for tourists to learn about the history of the mosque and engage with the culture of the building in interesting ways. This will increase their level of excitement and improve their learning experiences throughout visiting the mosque [23]. This idea is supported by Aziz *et al.*, [24] stating that QR Codes not only disseminate information to tourists but also engage tourists with the locals by sharing their experiences and opinions during visits, hence responding to their curiosity about Islam as well.

In a study conducted by [25, 26], the mosque in Jumeirah used QR Codes that helped tourists acquire direct information such as the history, the mosque's design, the activities, and the nearby tourist places. This will enhance tourists' experience as they gain desired information about the mosque and promote the mosque more extensively. In Malaysia, QR Codes are extensively used for cashless donations to embrace cashless transactions through financial technology. For instance, Sarawak State Mosque has used Maybank's QR Codes for payments or donations [27]. This alternative is said to be part of the government's initiative to better serve the Muslim community in terms of financial and economic development, as well as to implement digital technology as part of the mosque's services.

Besides, a study conducted by Hasmizi *et al.*, [28] also discovered that mosques in Kuala Lumpur have implemented E-Mosque Applications that allow tourists to access information on prayer times, mosque programs, activities, and other relevant sources through mobile phones. Therefore, it is agreeable that QR Codes can become a potential digital platform for disseminating information and supporting tourism marketing services, hence contributing to extending tourists' reach in religious buildings.

1.5 QR Codes in Other Heritage Contexts

QR Codes have vast potential for application in various heritage contexts that can enhance tourists' engagement, and improve educational experiences, and preservation efforts. According to the Malaysian Investment Development Authority (MIDA) (29), Malaysia Smart Tourism 4.0 was launched by Tourism Malaysia aimed to bring tourism products to the next level using technological advancement to enhance tourists' experiences, increase engagement, and improve sustainability by adopting environmentally friendly approaches. Based on the study by Nizar *et al.*, [30], Malaysia has applied QR Codes in the National Museum, Heritage Museum, and Cultural Museum to convey information about the artifacts displayed to visitors. By scanning the QR Codes, visitors can access detailed descriptions, historical contexts, and multimedia content including images, audio guides, and video of the exhibition.

Besides that, QR Codes have also been applied at the historical sites and monuments around Dataran Merdeka. Kuala Lumpur City Hall (DBKL) with the Ministry of Culture, Arts, Tourism, and Sports implemented the Dataran Merdeka KLQR Trail at 17 locations including the Dataran Merdeka flagpole, Victorian Fountain, Masjid Jamek Bridge, and Sultan Abdul Samad Building to guide tourists through historical trails or monuments within the site. The code also provides access to interactive websites containing detailed explanations of architectural features, construction techniques, and the historical significance of the building elements [31]. Figure 2 shows an example of the Dataran Merdeka KLQR Trail.

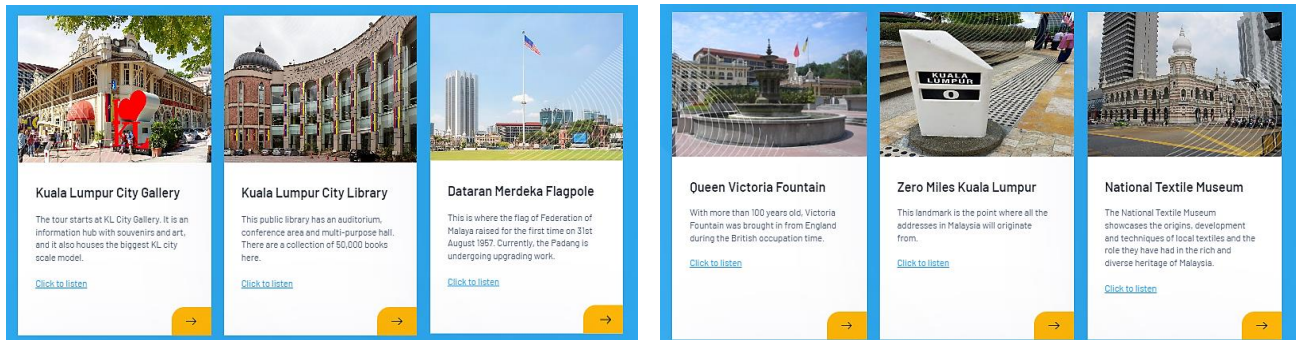


Fig. 2. Place of attraction in Dataran Merdeka KLQR Trail [26]

In addition to the studies on cultural landscapes and natural heritage, The Ministry of Tourism, Arts, and Culture Malaysia (MOTAC) together with the Ministry of Science, Technology, and Innovation Malaysia (MOSTI) have implemented QR Codes at the Malaysia Pavilion during Dubai Expo 2020 to share information about the Malaysian eco-tourism industry and to assist visitors with eco-tourism products in various destinations in Malaysia [32]. These QR Codes provide ecological information to visitors as they can link the content materials on sustainable eco-tourism, engage visitors with interactive, and real-time exhibitions that could enhance visitors' experience, and directly promote educational tourism to the public. Figure 3 shows the QR Codes at the Dubai Expo 2020 Malaysia Pavilion.



Fig. 3. The QR Codes at Dubai Expo 2020, Malaysia Pavilion [27]

1.6 Selected Malacca Heritage Mosques

Historically, Malacca was known for its trading ports in Malay land. The city was founded by Parameswara, the ruler of Temasik (now Singapore) in 1400 who found refuge in a small fishing village, and then decided to develop a settlement named 'Melaka' after a tree [33], and later became the new Malayan Empire. The strategic location of Malacca made it a popular trading port with merchants arriving from East and West countries such as India, China, Arab and Europe. The merchants also built their settlement through intermarriage, resulting in shaping the multicultural ethnicity, religion, and expansion of the community. Besides that, the expansion of Islamic teachings by Arab merchants in Malacca has developed the city as the earliest Islamic center in the Malay Archipelago [33-35].

According to the study by Sakeri [36], there are 6850 mosques in Malaysia registered under the Department of Islamic Development Malaysia (JAKIM) with as many as 80 mosques considered as heritage mosques. The term heritage mosques were coined in Malacca in 2008 as the city

demonstrated its richness in cultural and historical features. There are 33 heritage mosques identified as heritage mosques and 16 of them were built in the year between 1700 to 1900 [37]. Table 1 presents the list of heritage mosques in Malacca.

Table 1
Heritage mosques in Malacca (1700-1900)

Mosque	Year
1720	Kampung Peringgit Mosque
1728	Tengkera Mosque
1728	Kampung Hulu Mosque
1730	Pengkalan Rama Mosque
1748	Kampung Kling Mosque
1820	Bandar Hilir Mosque
1829	Hujung Pasir Mosque
1840	Teluk Mas Mosque
1850	Laksamana Hang Tuah Mosque
1865	Bukit China Mosque
1870	Kandang Mosque
1890	Kampung Alai Mosque
1890	Bakar Batu Mosque
1890	Limbongan Mosque
1890	Pokok Asam Mosque
1897	Bukit Piayu Mosque

Between 1700 to 1900, heritage mosques in Malacca were built with traditional vernacular style [38-41]. The mosques have decoration coming from the multicultural influences of Malay, Javanese, and Chinese styles [42, 43]. The distinctive features of the mosque and its cultural attributes generate a form of experiential learning and practical experiences for tourists when visiting the mosque. Moreover, the Muslim practices heighten the non-Muslim tourists' curiosity about Islam and may contribute to the tourists visiting the mosque to witness the religious rituals and practices. This directly transformed the mosque into a center of learning for tourists who are interested in seeking religious motives, experiencing a holy atmosphere, and strengthening their beliefs [44].

The architecture of heritage mosques showcases a diverse cultural interpretation, resulting in a remarkable learning experience when visiting the mosque. A study by Moghavemi *et al.*, [11] and Adriani *et al.*, [45] revealed that tourists visit the heritage mosque because of the historical and cultural heritage attributes. Tourists are motivated to visit the mosque to fulfill their curiosity about the mosque and tend to observe its history, culture, and heritage features. Rizvi [46] elaborates that mosque architecture promotes valuable learning to tourists by adopting new knowledge that sparks their interest in learning more about the cultural heritage of the mosque and surroundings.

1.7 Application of QR Codes at Selected Malacca Heritage Mosques for Interactive Edutourism

The use of digital platforms in selected Malacca heritage mosques has the purpose of disseminating information provides free-choice learning that combines personal context (motivation, experience, and knowledge), physical context (events or places that provide exploration and experience), and socio-cultural context [47].

Interactive educational tourism in heritage mosques is viewed as a potential that helps tourists enrich their knowledge and experiences using interactive multimedia or technology features, as it is practical, convenient and promotes self-directing learning to tourists [48]. Compared to traditional methods, this approach provides more engaging and informative experiential learning, leading to

higher levels of tourist' satisfaction. For example, the Islamic Tourism Sector (ITC) has established the Mosques Tour Program in the Federal Territory Mosque to promote the mosque as one of the Islamic Tourism Products to cater to tourists who are interested in learning Islam and Islamic architecture [49, 50]. Besides that, the 'Mosque Trail Tour' has been applied in Perak state on purpose to promote the mosque by highlighting the architectural, historical, and cultural significance of mosques using interactive websites [51]. These websites provide an enriched understanding of mosque history, and showcases the Islamic culture and heritage attributes in the mosque's design. In the context of educational experience, 'The Perak Mosque Trail Tour' provides an interactive learning element such as multimedia presentations, guided tours, and QR Codes to access additional information about the mosque. Figure 4 shows the example of the 'Perak Mosque Trail'.



Fig. 4. 'Perak Mosque Trail' [46]

The QR Codes also have been used in the mosque tourism sector for contactless payments, charities, MySejahtera applications during COVID-19, URLs containing data for registration to attend congregational prayers, and links to the channels of social media pages. For example, QR Codes have been introduced at the Putra Mosque Putrajaya that are linked directly to the Mosque's YouTube Channel and Zakat services. In Tuanku Mizan Zainal Abidin Mosque, Putrajaya, the application of Digital Infor Board allows tourists to obtain information about the mosque such as organization charts and mosque space. It is convenient for tourists upon visiting the mosque as the code becomes a medium to convey information about the mosque's management, activities, and programs offered to tourists [52]. It shows that the code contains various links that can be accessed directly without additional charge of cost or time.

2. Methodology

The location for the case studies of the research is Malacca City, and out of the 28 Malacca heritage mosques, five heritage mosques were selected based on their historical and architectural attributes that represent the richness of local and foreign cultural heritage influences as primary resources for tourists to access using QR Codes. This primary information engages tourists with cultural heritage values, hence elevating their learning experiences and exploration of heritage mosques. Besides architectural settings, the five case studies were selected based on the year of construction that portrayed almost similar design and form, as well as activities and programs

conducted at the mosque that could engage tourists with the community, hence promoting interactive learning opportunities. This information is key of knowledge to tourists' understanding of cultural heritage in heritage mosques and develops an interesting and exciting exploration. Table 2 lists the study area for this research.

Table 2
Selected Malacca heritage mosques

Mosque	Year
1720	Kampung Peringgit Mosque
1728	Tengkera Mosque
1728	Kampung Hulu Mosque
1748	Kampung Kling Mosque
1850	Laksamana Hang Tuah Mosque

This study adopted mixed methods approaches, through the structure of the questionnaire survey and the semi-structured interview. According to Johnson *et al.*, [53], mixed-methods research is a combination of qualitative and quantitative research approaches for the broad purposes of breadth and depth of understanding and corroboration. Corresponding to Rahman [54], and Wisdom and Creswell [55], the mixed-methods approach is applicable in all disciplines because the combination of qualitative and quantitative data provides more understanding and delivers complete results to address research questions. The cross-referencing in this approach is to determine the use of QR Codes as a digital platform to access information on the selected Malacca heritage mosques to improve tourists' learning experiences and promote educational tourism in cultural heritage sites.

Quantitative data were gathered using a questionnaire survey distributed both online and on-site, while a semi-structured interview was used for the identification of common themes and insights related to the research area. The combination of quantitative and qualitative methods provides both depth and breadth to the findings.

2.1 Sampling Method: Convenient Sampling

Convenient sampling is a non-probability sampling where the subjects (respondents) are selected based on the convenient accessibility and proximity to the researcher [56]. This study employed convenient sampling for the rapid collection of responses, which was practical given the study's time constraints. However, there is a limitation of using convenient sampling methods such as sampling bias as the research subjectively chooses people who are willing to participate in the research, thus might not fully represent the total population studied. Therefore, a large sample size of 350 respondents was targeted to enhance representativeness, with the use of online platforms and digital tools to reach a wider and more diverse audience within a convenience sample framework.

2.2. Questionnaire Survey

According to Rahman [54] and Bulmer [57], a questionnaire survey is an established tool to gather information on respondents' social characteristics, present and past experiences, and reasons for action concerning the topic under investigation. For this study, the survey was distributed using two methods: i) an online questionnaire survey, and ii) the distribution of surveys to hotels and tourists in Malacca.

2.3 Online Survey

Google Forms has become one of the popular tools for collecting data. These online forms enable researchers to create a questionnaire easily as they offer a wide range of features including image attachment [58]. Additionally, Google Forms integrates seamlessly with other platforms, hence it is convenient to use the application to conduct the surveys for this study. Google Forms is used and distributed on social media platforms such as Malacca Tourism Page, WhatsApp Group, and Malacca Instagram Page as the online survey can be accessed by the groups or individuals and respond within a minimum of time. Moreover, the online survey provides access to a larger group and is better represented comprehensively. Besides that, the study also established QR Codes and placed them in the selected case studies to reach better respondents. Figure 5 presents the placement of QR Codes in the study area.



Fig. 5. QR Codes placement at the case study areas

2.4 On-Site Survey

The distribution of the questionnaire survey was carried out from the middle of December until the end of January. This is because December and January are the holiday season and school break, thus Malacca is expected to receive the highest number of tourists visiting. Therefore, a total of 600 questionnaire surveys were distributed with (i) 300 surveys at the hotels around the study area, and (ii) 300 surveys at the tourist place around Malacca. For hotels, the receptionist distributed the survey to the respondents upon check-in at 2:00 p.m. and returned during check-out time.

2.5 The Structure of the Questionnaire Survey

The questionnaire survey consists of three sections, (i) respondents' demographic background, (ii) tourists' learning experiences at selected Malacca heritage mosques, and (iii) the use of QR Codes to access information on selected Malacca heritage mosques for interactive educational tourism. The items in section (ii) were evaluated using a Likert scale from 1 for 'Strongly Disagree' to 5 for 'Strongly Agree'. Open-ended questions are also applied to obtain information on the advantages and disadvantages of using QR Codes for accessing information about selected Malacca heritage mosques for tourists' learning experiences.

2.6 Semi-Structured Interview

In addition to the questionnaire survey, the study employed semi-structured interviews to explore details of the subject and to investigate any concealed viewpoints. Doyle [59] and Pollock [60] mentioned the question is more open-ended and offers advantages and opportunities to explore the topics and issues related to the study. In addition, the semi-structured interview is useful as an adjunct supplement and adds depth to the mixed method research [61]. Therefore, the purpose of

this interview is to collect opinions about the use of QR Codes in selected Malacca heritage mosques for interactive educational tourism. There are two groups of interviewees in this study. The first group consists of four academic practitioners, and the second group consists of five heritage mosque representatives. The interviews were conducted in two approaches (i) Zoom meetings, and (ii) face-to-face meetings.

The selection was made based on their involvement in the collaborative framework that combines knowledge, expertise, experiences, and opinions on the use of digital applications (QR Codes) to access information on selected Malacca heritage mosques to improve tourists learning experiences and promote interactive educational tourism. According to Aminuddin [62] and Azmi *et al.*, [63], the interview insight is important to deliver the understanding and knowledge about the importance of learning through heritage buildings as well as to introduce relevant tourist activities that can improve tourists' experiences and discovery on history and cultural attributes of the places.

3. Results

Based on the online surveys and on-site surveys, a total of 350 surveys were collected and analyzed, of which 99 surveys were from the online surveys, followed by 33 surveys from the on-site, and 218 surveys from tourists around the study area. Descriptive statistics including means, percentages, and standard deviations were calculated to summarize the characteristics of respondents and their perceptions of selected Malacca heritage mosques. This method was chosen to provide a clear and concise summary of the data and to identify the significant trends in the research area. The results of the survey are discussed below.

3.1 Survey Results

3.1.1 Demographic details of the respondents

As presented in Table 3, 211 respondents were female, and the remainder were male respondents. In terms of age, 28.9% of respondents aged 29-38, and all respondents were Malaysian. 347 respondents were Muslim, and 3 respondents were non-Muslims. For education, 126 respondents possessed a certificate/diploma studies and for marital status, 244 respondents were married followed by 100 single respondents, and only 6 were divorced. 127 respondents followed by 96 private sector employees, 58 students, and 25 unemployed respondents. Lastly, 65.7% (230) of respondents travel to Malacca for 2 to 5 days compared to 19.4% (68) respondents travel on a day trip, and 10.3% (36) respondents preferred to travel in one week.

Table 3
 Demographic details of the respondents (n=350)

Variables	Components	Respondents value	
		Unit	%
Gender	Male	139	39.7
	Female	211	60.3
Age	18-28	92	26.3
	29-38	101	28.9
	39-48	91	26.0
	49-58	43	12.3
	58 above	23	6.6
Citizenship	Malaysian	350	100
	Non-Malaysian	0	0
Religion	Muslim	343	98.0

Table 3. Continued
 Demographic details of the respondents (n=350)

Variables	Components	Respondents value	
		Unit	%
Education	Non-Muslim	7	2.0
	High school	69	19.7
	Certificate/Diploma	126	36.0
	Undergraduate	103	29.4
	Postgraduate	52	14.9
Marital Status	Married	244	69.7
	Single	100	28.6
	Divorcee	6	1.7
Occupation	Government sector	127	36.3
	Private sector employee	96	27.4
	Self-employed	43	12.3
	Student	58	16.6
	Unemployed	25	7.1
	Other	1	0.3
Travel period in one place	Day trip	68	19.4
	2-5 days	230	65.7
	1 week	36	10.3
	More than 1 week	16	4.6
	Total	350	100

3.1.2 Respondent visit to selected Malacca heritage mosques

According to Figure 6, 62.0% of respondents visit Tengkeru Mosque, followed by Kampung Hulu Mosque with 55.4%, Kampung Kling Mosque (37.4%), Peringgit Mosque (32.9%), and lastly Laksamana Hang Tuah Mosque with 26.9%. Based on the result above, most tourists visit the Tengkeru Mosque, Kampung Hulu Mosque, and Kampung Kling Mosque due to their location that located at the core zone of Malacca heritage sites and become one of the most visited places by tourists. Tengkeru Mosque recorded the highest number of tourists visited because the mosque is located on Tengkeru Road, which is mostly utilized by tourists to go to Jonker Walk, Baba & Nyonya Heritage Museums, the Stadthuis, Malacca Christ Church, and more.

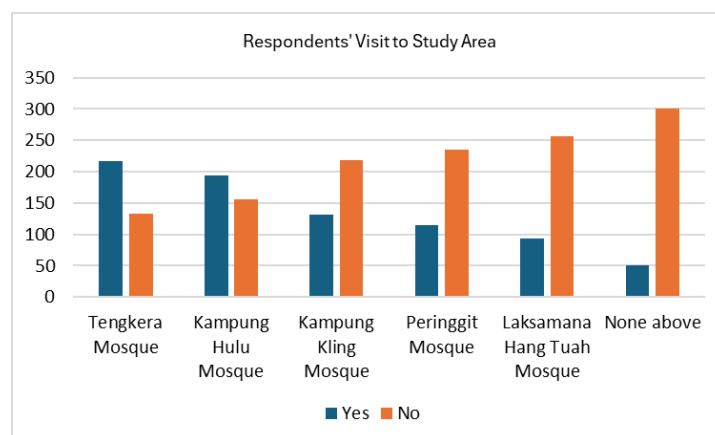


Fig. 6. Respondents' visit to study area

Other than that, the historical background and diverse cultural influences in design portrayed by Tengkeru Mosque have mesmerized tourists who want to learn about the cultural heritage attributes of the mosque. However, the Peringgit Mosque and Laksamana Hang Tuah Mosque received the

lowest average number of tourists visiting assumed to be due to the mosques' location in residential zones as opposed to Tengkeri Mosque, Kampung Hulu Mosque, and Kampung Kling Mosque which are in the core heritage zone. Peringggit Mosque and Laksamana Hang Tuah Mosque are built in the residential area, which is on the outskirts of the Malacca Heritage Zone. These mosques are far from the tourist places of attraction, except for Laksamana Hang Tuah Mosque which is located near the Hang Tuah Center.

3.1.3 Purpose of visit to selected Malacca heritage mosques

Based on Figure 7, 291 respondents visited selected Malacca heritage mosques for religious and spiritual purposes, followed by 103 respondents who chose to visit the mosque for tourist attractions. 57 respondents agreed to visit the mosque on purpose to learn the history of the mosque, and only 42 respondents chose to visit the mosque due to personal interaction with Islamic teachings. This can be justified by the interviewees' answers as presented in Table 4 below.

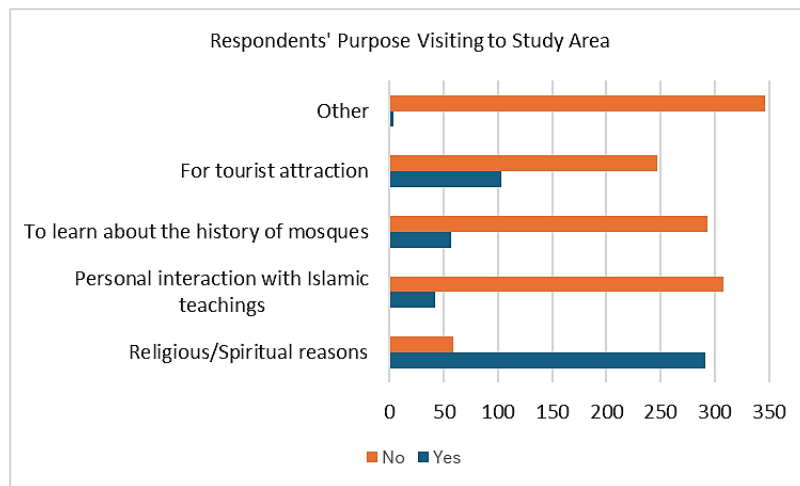


Fig. 7. Respondents' purpose visiting to study area

Table 4

Justification of statement by interviewees on tourists' purpose visiting the selected Malacca heritage mosques

Q: For what purpose do tourists visit selected Malacca heritage mosques?	
Theme code	Reasons
A-2	Most tourists visit Kampung Hulu Mosque to learn the history of the mosque as a tourist place of attraction, and also for spiritual reasons such as visiting old graveyards of Muslim scholars and taking water from the ablution pool for healing purposes.
A-4	Most tourists from Europe and Asia visit this mosque because of its location which sits next to the Chinese and Indian Temples. The mosque becomes a focal point for tourists that come from Jonker Street.
A-5	The mosque is well known for mosque tourism. Tourists from Turkey came to the mosque to learn about the history of the mosque, while other visitors came for religious and spiritual reasons, taking water from the ablution pool for healing purposes.
A-1	There are not many tourists visiting Peringggit Mosque, because this mosque is not popular compared to Kampung Hulu Mosque and Kampung Kling Mosque.
P-1	I think the lack of promotion affected the number of tourists visiting the heritage mosques. For instance, the Peringggit Mosque might have less promotion compared to the Tengkeri Mosque. Other than that, the location of the mosque that is not on tourist routes or among tourist attractions could affect tourist visits.

Based on Table 4, four interviewees agreed tourists visit the mosque for religious and spiritual needs (praying and visiting an old cemetery). Besides that, the interviewees also claimed that tourists visit selected Malacca heritage mosques on purpose to learn the history of the mosque and to expand their knowledge of Islam as well. In addition, the distinctive features of selected Malacca heritage mosques have aroused the curiosity of tourists to visit and experience the uniqueness of the mosque's design, hence the mosque becoming tourist centers of knowledge to explore and learn about the architectural style, the history, and the community engagement as well.

3.1.4 Tourists' learning experience in selected Malacca heritage mosques

As presented in Table 5, levels of satisfaction were measured using Likert scales from 1 (Strongly Disagreed) to 5 (Strongly Agreed). 60% of the respondents 'Strongly Agreed' with the variables 'selected Malacca heritage mosques are good examples of learning the history of cultural heritage buildings', followed by 58.9% of the respondents 'Strongly Agreed' with the variables 'overall, selected Malacca heritage mosques are considered one of the learning attractions for tourists that can improve their learning experiences in the cultural heritage area' respectively.

Based on the results presented, it is agreed that selected Malacca heritage mosques have the potential to become tourist learning attractions that promote cultural heritage knowledge to tourists and allow tourists to engage in personal spiritual and physical experiences through mosque tours and community activities. It is corroborated by the study on tourists learning in mosque tourism, as these components are essential not just to promote Islamic art and history, but also to improve tourists' experiences and motivation to learn and gain knowledge about the heritage values of the study area.

Table 5

Perception of tourists' learning experiences in selected Malacca heritage mosques

No	Variables	SD	D	UND	A	SA	Mean	Std. D.
		%	%	%	%	%		
1	Selected Malacca heritage mosques exhibit a unique design to attract tourists' attention to learn the mosque design appearance	0.3	0.3	6.6	39.1	53.7	4.46	0.657
2	Selected Malacca heritage mosques offer an exciting experience in discovering the history and cultural values of the mosque	0.3	0.3	9.4	36.6	53.4	4.43	0.697
3	Selected Malacca heritage mosques' design contributes to tourists' intention to learn cultural heritage values	0.3	0.3	7.7	37.1	54.6	4.45	0.674
4	Selected Malacca heritage mosques are in good condition for learning activities	0.3	0.3	8.3	33.1	58.0	4.48	0.684
5	Selected Malacca heritage mosques can educate tourists about Islam and the beauty of Islamic architecture	0.3	0.3	6.0	35.7	57.7	4.50	0.650
6	Selected Malacca heritage mosques are a good example of learning the history of cultural heritage buildings	0.3	0.6	6.6	32.6	60.0	4.51	0.672
7	Overall, selected Malacca heritage mosques are considered one of the learning attractions for tourists to improve their learning experiences in the cultural heritage area	0.3	0.3	6.6	34.0	58.9	4.51	0.659

Besides historical attributes, 58% of the respondents ‘Strongly Agreed’ that ‘selected Malacca heritage mosques are in good condition for learning activities. There are various community activities and Islamic programs conducted in the selected Malacca heritage mosques that encourage tourists to participate and engage with people such as community charity work, Ramadhan Bazaar, Muslim festivals, cultural games, and many more.

In line with the National Tourism Policy 2020-2030, it is suggested that developing ideal Muslim-friendly activities and programs can introduce Islamic culture and heritage to tourists. This interactive activity may also attract non-Muslim tourists to discover about Islam and indirectly promote the cultural and heritage values of these mosques. In addition, Table 6 below justifies the statement from the interviewees regarding the interactive activities and programs for tourists' learning opportunities in selected Malacca heritage mosques.

Table 6

Perception of tourists’ learning experiences in selected Malacca heritage mosques

Q: How to educate people about the heritage mosques?	
Theme code	Reasons
A-1	We provide an Islamic program to attract people to learn about Islam and some of the information we post on social media platforms.
A-5	We conduct various programs during every Islamic event such as <i>terawikh</i> prayer, <i>qiamullail</i> during the fasting month, religious talks, and more. We also donate to poor families in our community. Other than that, we conduct <i>Fardhu Kifayah</i> courses such as <i>kursus pengendalian jenazah</i> , seminars, and a movable clinic for the community.
P-1	Provide some information using methods like tour guides or using smart devices for tourists. For the community approach, we can conduct an interactive mosque program to attract people to come to mosques or provide a bureau of learning and academics to instill the learning program in every mosque program.
P-2	Provide activities that can create awareness among people about the cultural heritage of mosques. This will help people to understand more about the historical value of the mosque and appreciate it more.
P-3	Provide a program that inculcates heritage among young children such as sketching the building, storytelling and simply bringing the kids to the mosque so they can feel interested in the space.
P-4	Provide awareness to people about preserving and conserving historical mosques so the future generation can appreciate and learn the historical value of the buildings.

Based on the justification by the interviewees, the current programs provided by these heritage mosques focus on various Islamic programs and activities to attract people to learn and visit the mosque such as Islamic talks, and religious events that are also widely celebrated and much-anticipated occasions in these heritage mosques. This includes Islamic festivals such as the holy month of Ramadhan, Eid-ul Fitr, and Eid-ul Adha which are celebrated among the communities and have participated by non-Muslims too. These festivals showcase these heritage mosques as a center of gathering and ‘open’ to all guests- regardless of social status, religion, and race with one purpose to celebrate the festivals and participate in community events.

Besides Islamic programs and festivals, it could be suggested that an interactive program can be implemented to promote the history and culture of selected Malacca heritage mosques. For example, a story-telling program and interactive multimedia exhibition to instill knowledge about the history and cultural heritage attributes of the mosque or explore-race activities that allow tourists to have a personal exploration and self-learning at heritage mosques.

3.1.5 Source of information on selected Malacca heritage mosques

As presented in Figure 8, the information provided by the Tourism Malaysia Website (48.9%) was the principal source that has been utilized by tourists when visiting the mosque. Photos shared on social media (44.3%) ranked second and the previous visitors (word-of-mouth) ranked third with 26.7% respectively. These findings suggest the use of websites and word-of-mouth become a primary source of information for tourists to obtain information on selected Malacca heritage mosques. The results also indicate that tourists preferred to use digital technology compared to other alternatives such as travel agents tour guides (3.1%) or others.

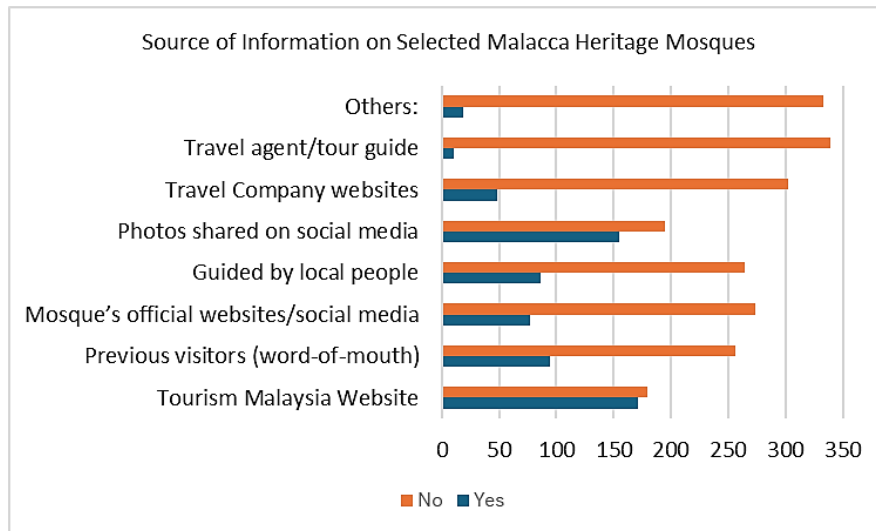


Fig. 8. Source of information on selected Malacca heritage mosques

This may be because browsing websites is easier and faster when searching about heritage mosques. The Tourism Malaysia website offers interactive and detailed information that facilitates tourists to learn and discover the characteristics of the mosque and its events. Other than that, materials on the websites may build a positive and robust destination image that directly motivates tourists to visit these Malacca heritage mosques. The use of websites not only opens up new distribution channels for tourism, but also permits new communication platforms in the context of interactive maps, virtual tours, journey planners, and many more.

In the context of the cultural heritage tourism industry, the integration of technology such as web-based technologies not only facilitate access to information and extended services, but also simplifies and improves the use of tourism products and facilitates the exploration of new tourism markets. It is believed that the increased use of digital technologies such as web-based applications, e-services, and social media may attract more tourists to visit the destination, hence meeting their changing needs and usage habits more effectively during traveling.

Moreover, this technology may reduce tourists' uncertainty about the destination, as the web-based applications and social media networks provide real-time assistance, feedback, and opinions of the place, hence making it easier for tourists to decide and plan for their trip. Besides that, mobile applications such as location-based services can be used for navigation and to update information about nearby attractions.

3.1.6 Perception of the use of QR Codes in selected Malacca heritage mosques

As presented in Table 7, levels of satisfaction were measured using Likert scales from 1 (Strongly Disagreed) to 5 (Strongly Agreed). 44.9% of the respondents 'Strongly Agreed' with the variables 'QR codes can be used as a platform to access information about selected Malacca heritage mosques', and 'In my opinion, QR Codes can be used to engage tourists for a better learning experience and promote educational tourism'. This was followed by 43.7% of the respondents 'Strongly Agreed' 'QR codes provide the easiest and fastest access to websites containing information about selected Malacca heritage mosques', and the statement 'I found limited and non-updated resources on selected Malacca heritage mosques when using websites' (29.7%)

Table 7
 Perception of the use of QR Codes in selected Malacca heritage mosques

No	Variables	SD	D	UND	A	SA	Mean	Std. D.
		%	%	%	%	%		
1	I use tour agents or volunteers to explain the history of selected Malacca heritage mosques	50 14.3	37 10.6	87 24.9	70 20.0	106 30.3	3.41	1.387
2	I use websites to learn about selected Malacca heritage mosques	48 13.7	34 9.7	82 23.4	136 38.9	50 14.3	3.30	1.232
3	I found limited and non-updated resources on selected Malacca heritage mosques either printed materials or on the internet	33 9.4	32 9.1	87 24.9	94 26.9	104 29.7	3.58	1.261
4	QR Codes can be used as a platform to access information about selected Malacca heritage mosques	7 2.0	2 0.6	27 7.7	157 44.9	157 44.9	4.30	0.866
5	In my opinion, QR Codes provide the easiest and fastest access to websites containing information about selected Malacca heritage mosques	7 2.0	3 0.9	33 9.4	154 44.0	153 43.7	4.27	0.786
6	In my opinion, QR Codes can be used to engage tourists for a better learning experience and promote educational tourism	7 2.0	2 0.6	27 7.7	157 44.9	157 44.9	4.30	0.800

According to the findings in Table 7, tourists agreed that they are interested in using QR Codes as a digital platform to access information on selected Malacca heritage mosques. QR Codes enable tourists to access the content of websites that show detailed information about these heritage mosques such as the history, the cultural heritage value of the mosque, the place of attraction surrounding the mosque, or other heritage mosque trails and travel guides. In addition, the code also could be used to promote the cultural heritage of the mosque by linking the code to the interactive tourist activities, festivals, and events in the mosque. Besides that, QR Codes also be utilized through access to media social platforms such as the Mosque's Facebook Page which displays the interactive programs and activities conducted in the mosque for tourists' acknowledgment.

In cultural heritage tourism, this application is helpful for tourists who have an interest in learning and experiencing the cultural heritage of the place. It is possible to make the cultural heritage fully accessible 'on-site' by providing reliable information and presenting entertainingly. The integration of technology into the tourism industry may reflect the 'edutainment' concept; entertainment-oriented learning that offers virtual presentations, 3D-based animated, Augmented Reality (AR), and many more that show the history, culture, art, and heritage values of the places.

This approach benefits tourists, as it could engage tourists in a better learning experience and promote educational tourism. Besides promoting interactive education on heritage building, QR

Codes could be used to spread awareness of the preservation as well. This could be done by scanning the code, and tourists may learn about the conservation work done by the authorities and then make a donation to support the conservation process. Therefore, it is suggested that the integration of QR Codes could increase both intellectual and physical accessibility of cultural heritage while considering the conservation requirements and promoting educational tourism to tourists. This result is also supported by the interviewees as presented in Table 8.

Table 8

Perception of the use of QR Codes to disseminate knowledge to tourists

Q: Do you think QR Codes can help tourists to get information more easily?	
Theme Code	Reasons
P-1	QR Codes are one of the efficient tools to communicate with visitors to the mosque.
P-2	QR Codes are the current application to disseminate information. It simplifies the way of distributing information.
P-3	QR Codes provide self-guides for tourists. The application could be linked to the mosque's websites or facilitate visitors in accessing facilities provided in the mosque such as female prayer rooms.
P-4	QR Codes help tourists to see artifacts in digital form. The application also could be used as digital documentation for future generations to learn about the historical buildings.
A-1	QR Codes are mainly used for cashless donations.
A-3	QR Codes help to educate people about the mosque through images.
A-2	The application provides input about the mosque's attractions to the visitor.
A-5	Ease visitors to obtain information about the mosque.

According to Table 8, all interviewees agreed that QR Codes could improve tourists' plans by accessing information about selected Malacca heritage mosques by linking to informative websites. Compared to traditional methods such as printed brochures or word-of-mouth, this approach may provide up-to-date and consistent content, leading to a more engaging and informative experience for tourists. Other than that, QR Codes are also utilized for donations and linked to the content of the mosque's facilities which may ease tourists upon visiting the mosque.

As a result, this information guides tourists to self-learn, hence improving their knowledge value, which in turn enhances tourists' satisfaction and increases their loyalty and other relevant positive behaviours such as curiosity to learn more about the cultural heritage of mosques.

3.2 Correlation Analysis

The correlation analysis is used to investigate the relationship between the variables and to establish the possible connections between the variables depending on the numerical values measured which are negative correlation (-1.0) to positive correlation (+1.0). The correlation analysis between intervening variables was performed to investigate the relationship between each component under dependent variables. Therefore, this section investigates and analyses the intervening variables between tourists' learning experiences on selected Malacca heritage mosques and the use of QR Codes to access information on selected Malacca heritage mosques. The result of the findings is shown in Table 9.

Table 9

Intervening variables between tourists' learning experience and the use of QR Codes at selected Malacca heritage mosques

Tourists' learning experience on selected Malacca heritage mosques								
The use of QR Codes in selected Malacca heritage mosques		Unique design to attract tourists' attention to learn the mosque's design appearance	Exciting experience in discovering the history and cultural values of the mosque	Tourists' intention to learn cultural heritage values	Good condition for learning activities	Educate tourists about Islam and the beauty of Islamic architecture	A good example of learning the history of cultural heritage buildings	Learning attractions for tourists to improve their learning experiences in the cultural heritage area
Use tour agents or volunteers	r p	.203 .000	.182 .000	.175 .000	.229 .000	.185 .000	.244 .000	.220 .000
Use websites to learn about the mosque	r p	.207 .000	.180 .000	.196 .000	.203 .000	.156 .000	.209 .000	.205 .000
Limited and non-updated resources either printed materials or on the internet	r p	.220 .000	.222 .000	.234 .000	.291 .000	.232 .000	.312 .000	.277 .000
QR Codes as a platform to access information	r p	.359 .000	.333 .000	.356 .000	.354 .000	.375 .000	.366 .000	.397 .000
QR Codes provide the easiest and fastest access to websites	r p	.278 .000	.253 .000	.288 .000	.263 .000	.271 .000	.272 .000	.318 .000
QR Codes can be used to engage tourists for a better learning experience and promote educational tourism	r p	.252 .000	.252 .000	.303 .000	.275 .000	.280 .000	.260 .000	.300 .000

Table 9 indicates the result of intervening variables between tourists' learning experiences with the use of QR Codes to access information on selected Malacca heritage mosques. This is to determine the use of QR Codes as a digital method that links the content of information of heritage mosques to the tourist, hence, elevating tourists' learning experience and promoting interactive educational tourism in heritage sites. The overall data analysis showed a positive correlation with the highest number ($r=.397$) on the variables 'QR Codes can be used as a platform to access information about selected Malacca heritage mosques' and ($r=.318$) on the variable 'QR Codes provide the easiest

and fastest access to websites' with the variable 'selected Malacca heritage mosques are considered one of the learning attractions to improve tourists learning experiences in cultural heritage area'. The variable 'selected Malacca heritage mosques are good examples of learning the history of cultural heritage buildings' shared the highest correlation value with the variable 'Use tour agents or volunteers to explain the history of the mosque' ($r=.244$), 'Use websites to learn about selected Malacca heritage mosques' ($r=.209$), and 'limited and non-updated resources on the mosque either printed materials or on the internet' ($r=.312$). Finally, the variable 'QR Codes can be used to engage tourists for a better learning experience and promote educational tourism marked the highest correlation value of ($r=.303$) with the variable 'the mosque's design contributes to tourists' intention to learn cultural heritage values.

The findings in Table 9, present the potential of using QR Codes as a digital tool to improve tourists' learning experiences at selected Malacca heritage mosques. The analysis shows there is a positive correlation between the use of QR Codes with the various factors related to tourists' learning experiences, such as accessing information about Malacca heritage mosques, providing fast and easy access to website content, engaging tourists with better learning, and promoting educational tourism to tourists using technology-wisely.

These findings align with the existing research on the use of technology-based tools in cultural heritage tourism, as tourists seek relevant information about the places they visit, and QR Codes are a convenient application that could facilitate the purpose by linking digital content directly to tourists when scanning the code. Furthermore, the study's emphasis on the contribution of the mosque's design to tourists' intention to learn cultural heritage values underscores the importance of integrating technology tools with the physical heritage environment.

In addition, the analysis also suggests that QR Codes can minimize the issue of limited and non-updated resources on Malacca heritage mosques, as the code can linked to online resources and the content can be modified to reflect the most current information. It is also linked to extensive resources like videos, articles, or databases that provide more in-depth information than printed materials, hence enhancing tourists learning experiences in heritage sites. Moreover, technology integration in a cultural heritage context could provide a cost-effective and easily updatable platform for disseminating information about heritage places, thus creating a potential educational tourism destination. A further view, the positive correlation between the use of QR Codes with the tourists' intention to learn cultural heritage values at Malacca heritage mosques suggests the importance of a holistic learning approach by creating more immersive and meaningful learning experiences for tourists.

4. Conclusion

This study intended to determine the relevancy of QR Codes as a digital platform to access information on selected Malacca heritage mosques. Tourists' main intention in visiting Malacca heritage mosques is to learn and explore the history and the cultural heritage attributes, in which tourists could connect with other cultures by seeing the attributes from the past and appreciate its diverse cultures. The study found that there are convincing findings on the use of QR Codes to access information on selected Malacca heritage mosques. It is revealed that QR Codes can become one of the official codes that store URLs containing information on selected Malacca heritage mosques. Upon scanning the code, tourists could access the information, engage with communities, share opinions with other tourists, and disseminate information about heritage mosques effectively.

The study also found that QR Codes could offer interactive learning opportunities through digital documentation such as video presentations, audio files, images, multimedia exhibitions, and many

more that can attract tourists visually as they have the power to evoke emotions and retain the audience's attention, thus promoting interactive educational tourism in Malacca heritage mosques. Besides that, research studies and feedback indicate that the facilitation of QR Codes in selected Malacca heritage mosques offers tourists' active participation, elevates their point of interest in learning history and cultural heritage attributes, as well as engages tourists with locals through community activities and practices. This approach fosters a deeper connection between tourists and the places and encourages self-guided learning experiences and immersive exploration. Besides promoting interactive and leisure learning, QR Codes also support preserving heritage values by raising people's knowledge and awareness and becoming a reference point for learning basis publicly including students and researchers.

In conclusion, QR Codes could be considered the new market application that can attract tourists to use technology in cultural heritage tourism that offers fast access to information related to the heritage buildings, tourist activities, facilities, and services provided, hence enriching their understanding, and developing their interest in culture and heritage area. The development of QR Codes at selected Malacca heritage mosques offers lifelong learning and an entertainment-oriented learning approach, hence creating a vibrant sense of learning and experience.

As technology develops, incorporating QR Codes as a digital platform to access information spurs an engaging and inclusive future for educational tourism and cultural heritage tourism. Ultimately, QR Codes can become effective learning tools and can be used as a 'gateway' to access detailed information and open the door for more knowledgeable and enriching exploration.

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