CULTURAL HERITAGE

ARTICLES FOR FACULTY MEMBERS

Title/Author	Bibliometric analysis on the implementation digitization technologies in cultural heritage in Malaysia / Salleh, S. Z., & Bushroa, A. R.
Source	*Malaysian Journal of Society and Space* Volume 18 Issue 2 (2022) Pages 287-300 https://doi.org/10.17576/geo-2022-1802-22 (Database: Penerbit UKM)

Title/Author	Circular economy strategies for adaptive reuse of cultural heritage buildings to reduce environmental impacts / Foster, G.
Source	*Resources, Conservation and Recycling* Volume 152 (2020) 104507 Pages 1-14 https://doi.org/10.1016/J.RESCONREC.2019.104507 (Database: ScienceDirect)

Title/Author	Community Participation in the Importance of Living Heritage Conservation and Its Relationships with the Community-Based Education Model towards Creating a Sustainable Community in Melaka UNESCO World Heritage Site / Abdul Aziz, N. A., Mohd Ariffin, N. F., Ismail, N. A., & Alias, A.
Source	*Sustainability* Volume 15 Issue 3 (2023) Pages 1-19 https://doi.org/10.3390/SU15031935 (Database: MDPI)

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Title/Author	**Conceptualisation of heritage diplomacy in scholarship /** **Lähdesmäki, T., & Čeginskas, V. L. A.**
Source	*International Journal of Heritage Studies* **Volume 28 Issue 5 (2022) Pages 635-650** https://doi.org/10.1080/13527258.2022.2054846 **(Database: Taylor & Francis Online)**

Title/Author	**Cultural heritage preservation efforts in Malaysia: A survey /** **Suaib, N. M., Ismail, N. A. F., Sadimon, S., & Yunos, Z. M.**
Source	*IOP Conference Series: Materials Science and Engineering* **Volume 979 Issue 1 (2020) Pages 1-11** https://doi.org/10.1088/1757-899X/979/1/012008 **(Database: IOP Publishing)**

Title/Author	**Geological, biological, cultural and local wisdom heritage a key element of mersing geopark development / Said, M. Z., Komoo, I., Mohamad, E. T., Ali, C. A., Ahmad, N., Wahid, M. E. A., & Rajimin, M. F.**
Source	*Bulletin of the Geological Society of Malaysia* **Volume 71 (2021) Pages 89-98** https://doi.org/10.7186/bgsm71202108 **(Database: Geological Society of Malaysia)**

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Title/Author	Stakes and Challenges for Underwater Cultural Heritage in the Era of Blue Growth and the Role of Spatial Planning: Implications and Prospects in Greece / Papageorgiou, M.
Source	*Heritage* Volume 2 Issue 2 (2019) Pages 1060-1069 https://doi.org/10.3390/HERITAGE2020069 (Database: MDPI)

Title/Author	The role and dimensions of authenticity in heritage tourism / Park, E., Choi, B. K., & Lee, T. J.
Source	*Tourism Management* Volume 74 (2019) Pages 99-109 https://doi.org/10.1016/J.TOURMAN.2019.03.001 (Database: ScienceDirect)

Title/Author	Research on the Ways to Protect and Inherit Intangible Cultural Heritage in the Information Age / Guo, Q.
Source	*Journal of Physics: Conference Series* Volume 1575 Issue 1 (2020) 012169 Pages 1-5 https://doi.org/10.1088/1742-6596/1575/1/012169 (Database: IOP Science)

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Bibliometric analysis on the implementation digitization technologies in cultural heritage in Malaysia

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Abstract

Malaysia is a rich country with significant tangible and diverse intangible cultural heritage assets. The cultural heritage information must be collected in order to transmit the information to future generations. In this digital era, knowledge transmission can be easily spread using digital platforms. Furthermore, the post-Covid-19 pandemic driven necessity of digital sharing platforms. However, the status of digital cultural heritage in Malaysia is unknown. Hence, this paper will be addressed the digitization of cultural heritage implementation in Malaysia based on the published research articles. The data extracted from the Web of Science and Scopus database has been analysed using bibliometric analysis. The search keywords related to the digitization of cultural heritage has extracted about 171 documents over 15 years of publication. This finding is significant to provide local researchers and related institutions with the potential of digital cultural heritage in a post-Covid-19 pandemic. The large potential of digital cultural heritage should motivate local researchers to increase the attention on digitization cultural heritage research area. Many potential applications which are benefited cultural heritage tourism, sustainability as well as contribution to the economy. The findings from this research indicate that the trend of digitization in the cultural heritage field needs to be strengthened.

Keywords: bibliometric analysis, cultural heritage, digitization, Malaysia, post-Covid-19 pandemic, publication analysis

Introduction

Cultural heritage is important for every society where the information from the past can be used to determine the identity of each society. Cultural heritage can be divided into two categories which are tangible and intangible. The tangible cultural heritage is the legacy of physical artefacts, while intangible cultural heritage such as various technologies features of some culturally-distinct groups that are inherited from the past generations, maintained in the present time and curated and nurtured for the benefit of future generations (Stapleton et al., 2019). Both categories are important and need to be preserved, conversed and transmittable for sustainable cultural heritage. The preserved cultural heritage can lead to survival traditions and can connect the society with history.

The potential of heritage conservation also can give benefits for heritage tourism (Daeng Jamal & Ramli, 2021). The growth of the economy can drive better enhancement in innovations, creativity, prosperity and social values of cultural heritage (Kantor & Kubiczek, 2021).

In Malaysia, there are many tangible and intangible cultural heritage. Malaysian craftsmen are highly artistic and skilful to transform the traditional design elements into unique and aesthetically pleasing pieces which carry deeper philosophical and sacred meanings (Shuaib & Enoch, 2013). Malaysia had 12 tangible and intangible cultural heritage assets that have been awarded by international bodies such as United Nations Educational, Scientific and Cultural Organization (UNESCO) (Suaib et al., 2020). Recently, songket is the latest and become the sixth National Heritage recognized by UNESCO in intangible cultural heritage. The weaving skills for making traditional songket are endangered due to factory-based weaving (Zhang et al., 2018). Hence, the protection for songket was submitted to UNESCO in 2021. A year later, the Malaysian songket obtained international recognition for intangible cultural heritage.

In fact, the sustainability of the cultural heritage still questionable (Hua, 2015). The risk of extinction of cultural heritage assets are related to the modernization and physical development (Yusoff et al., 2013), natural disasters (Matusin et al., 2019) or the impact induced by tourism activities and the background of the visitors (Mohamad et al., 2015). Malaysia government actively protect cultural heritage asset at the national level by introducing several plans or acts such as Malaysian architectural history (Khairul et al., 2021), Malaysian Urban-Rural National Indicators Network for Sustainable Development (MurniNet 2.0) (Idris et al., 2021) and National Heritage Act 2005 (Daeng Jamal & Ramli, 2021).

The other protection ways of cultural heritage are via the implementation of digitization technologies. The digital cultural heritage can ensure the sustainability of cultural heritage and become a powerful tool to avoid the complete loss of the memory of cultural heritage assets. Digital technologies enable reconstruction and reproduction in creative ways. Furthermore, the digitization of cultural heritage is also included in the Twelfth Malaysia Plan (RMK-12). The RMK-12 accelerates technology adoption where the country's economic sector can be revived with the implementation of advanced technology, specialized capabilities as well as digitization technologies. The reuse content of digital cultural heritage can generate new business models for economic growth.

The global scale of the Covid-19 pandemic and its sustained duration has negative impacts on museums and related institutions. The post-Covid-19 regulated a new standard of operations that restrict many physical activities. For instance, a limited number of participants for visiting the museums, exhibitions, as well as any conferences. During the pandemic, the digital cultural heritage has become a source of virtual activities that can provide a continuous approach in connecting society with cultural heritage. The digital cultural heritage can be extensively applied with various creative ways as ways to preserve, conserve and sustain the cultural heritage. The dynamic combination of digitization technologies enables a precise reconstruction of heritage objects and photo-realistic 3D model reconstruction (Obradović et al., 2020).

Previously, a survey regarding the state of digitization initiatives by cultural institutions in Malaysia was reported in 2007 (Abd, 2007). Since then, digitization technologies have advanced to the point where it can be used to digitise cultural heritage. However, no further publication has reported on the current state of digital cultural heritage in Malaysia. Hence, the purpose of this work is to investigate the status of cultural heritage digitization through bibliometric analysis. This analysis can assist in updating the current states, the progress of digitization research as well as the research directions.

Method and study area

The analysis of the literature using bibliometric analysis can assist the investigation regarding the trend of the literature. The analysis can visualize the mapping of literature by extracting the database collected from the search engines particularly from Web of Science, Scopus or Dimensions. The analysis of the literature database is valuable in giving reliable information.

The analysis via bibliometric can establish the quantitative as well as quantitative aspects of the research development. The analysis can be divided into various variants such as based on the document, keywords, and collaboration of the research fields.

This paper utilized the bibliometric analysis via the Biblioshiny package available in the R-Studio tool. The paper aims to investigate the current status of digitization technologies implementation in cultural heritage fields in Malaysia. The analysis is based on the published literature associated with digitization technology, cultural heritage, and Malaysia for future research directions.

The bibliometric analysis has several steps which started with collecting the database from eligible search engines. In this study, a database from Web of Science and Scopus were extracted for revealing the related facts from published literature. The database was collected until January 2nd, 2022. The main search keywords are "cultural heritage", "digital*", and "Malaysia" with the Boolean operators AND and OR as tabulated in Table 1. The details of the database will be used to map the trend. The Biblioshiny package in R-Studio will be used to analyse the database (Aria & Cuccurullo, 2017). The R-Studio also assist in combining and deleting any duplicated literature in the database before further analysis. In this study, the total number of duplicates is 301.

Table 1. Main search keywords.

Main search keywords	Number
Web of Science	
ALL=(digital* OR digitization) AND TI=("cultural heritage") AND CU=(Malaysia)	15
ALL=(digital* OR digitization) AND AB=("cultural heritage") AND CU=(Malaysia)	48
ALL=(digital* OR digitization) AND AK=("cultural heritage") AND CU=(Malaysia)	26
ALL=(digital* OR digitization) AND ALL=("cultural heritage") AND CU=(Malaysia)	58
Scopus	
ALL (digital* OR digitization) AND TITLE-ABS-KEY (cultural AND heritage) AND AFFILCOUNTRY (Malaysia)	162
ALL (digital* OR digitization) AND TITLE-ABS-KEY (cultural heritage) AND AFFIL (Malaysia)	163

Results and discussion

The overview of the digitization of cultural heritage in Malaysia based on the published literature is reviewed. The collected database included all types of documents and was restricted to English only. The main information of the database collected from Web of Science and Scopus can be extracted. For instance, the extracted database showed that 171 published literatures are related to the search keywords as listed in Table 1. The collected database showed that the earliest literature is published in 2007. Within the 15 years of publications, the literature was published in 133 different sources.

Document analysis

Under the document analysis, the type of documents extracted from the Web of Science and Scopus can be analysed. The extracted detail of the document is shown in Figure 1. Based on the analysis, the article type is highly published by researchers followed by the conference paper with 49.71% and 42.11%, respectively. The combination of the article, conference paper and proceedings paper is recorded 96.50% from document types. This indicates that the original research works regarding the digital cultural heritage are the highest compared to the other type of documents such as the review or book chapter. Within the 15 years of publications, 85 articles have been published by local researchers.
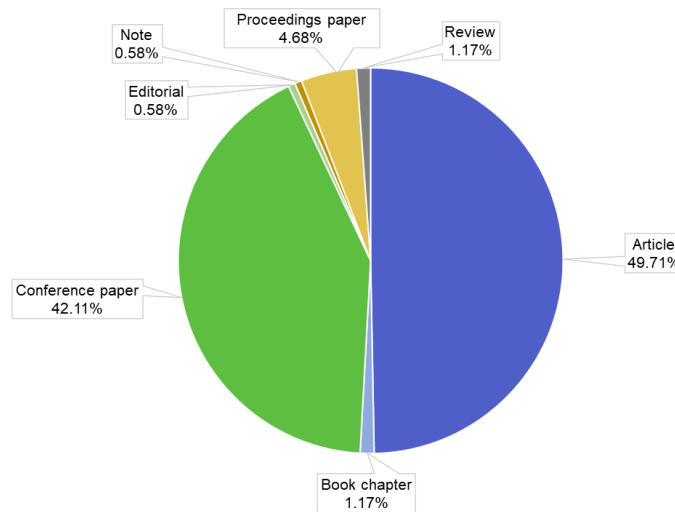

Figure 1. Type of documents extracted from the Web of Science and Scopus.

The number of published literatures between 2007 until 2021 is shown in Figure 2. The trend of published documents showed that the year 2019 shows a reduction as compared to the previous year. However, the number of published documents keep increasing. The number of documents in the year 2021 is recorded at 25. Meanwhile, the mean total citation per article (MeanTCperArt) showed the highest number in 2009 with 23.00 MeanTCperArt. The other years showed MeanTCperArt is lower than 6.33.
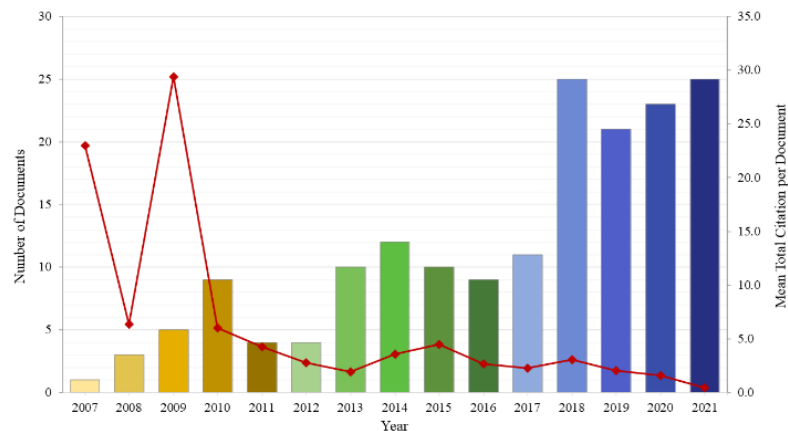

Figure 2. Number of published literature and mean total citation per year between 2007 until 2021.

The published documents in 2007 and 2009 with significant number of total citations are listed in Table 2. The increment number of document started from 2007 are related to the adoption of the UNESCO Charter on the Preservation of Digital Heritage was adopted in 2003. Then, the National Heritage Act 2005 also prompted the Malaysian initiatives in digitizing cultural heritage in Malaysia. In 2007, a document published by Abd showed the second number of citations. A document is considered a highly cited article when the number of citations is >100 times (Zhang et al., 2019). Although it cannot be categorized as a highly cited document, this document showed a significant contribution to the digitization of cultural heritage. This published article indicates that the researcher in Malaysia already started to pay interest in the digitization of cultural heritage since 2007. The highest cited article is contributed by Noh in 2009. The document is published for Lecture Notes in Computer Science where the total citation is recorded at 109. The document gained attention from other researchers because the document was well-written that contained information about the overview of augmented reality for cultural heritage. This document compiled virtual heritage projects and also provided a thorough explanation of the techniques used to reconstruct virtual heritage systems.

Table 2. Published documents in 2007 and 2009

Authors	Title	Year	Source	Total Citation
Abd M Z	The State of Digitisation Initiatives by Cultural Institutions in Malaysia an Exploratory Survey	2007	Library Review	23
Noh Z; Ismail A;Sunar M	Exploring the Potential of Using Augmented Reality Approach in Cultural Heritage System	2009	Proceedings of the 2nd International Conference on Advanced Computer Theory and Engineering, ICACTE 2009	2
Noh Z; Sunar M; Pan Z	A Review on Augmented Reality for Virtual Heritage System	2009	Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	109
Razali S; Md N N; Wan A W	Structuring the Social Subsystem Components of the Community Based Emuseum Framework	2009	Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	3
Samad A; Bahari S; Abd R S; Hashim K	Image Processing for Facade Mapping Using Digital Close Range Photogrammetric DCRP Approach	2009	Proceedings Of 2009 5th International Colloquium on Signal Processing and Its Applications, CSPA 2009	4

Keywords analysis

In bibliometric analysis, keywords are important word analysis to reveal the trend of the research area. In keywords analysis, it can be categorized into two groups which are Author's Keyword and Keyword Plus. The Author's Keyword is recorded at 529 meanwhile the number of Keyword plus is recorded at 716. The number of keywords for Keyword Plus is higher than Author's Keywords because the Keyword Plus considered the keyword from the entire content of documents including the title of the article itself (Tripathi et al., 2018). The top Author's Keyword with high

occurrence can give indications of the research are priorities and researchers interests (Zhang et al., 2019).

Based on the Keywords analysis, the word of keywords can be accumulated and grouped into the WordCloud. Figure 3 (a and b) shows the WordCloud formation using Author's Keyword and Keyword Plus from the collected database, respectively. From both keywords, it can be stated that the digitization of cultural heritage in Malaysia started to look more into the potential applications of digital cultural heritage. For instance, the keywords of virtual reality, augmented reality, virtual heritage are among the largest sized for Author's Keywords. The WordCloud of Author's Keyword also shows the importance of online user perspective. The enjoyable informal learning and also the user experience are included. In comparison with Keyword Plus, the main keyword is historic preservation which indicates the main aims of digitizing cultural heritage. Similarly, Keywords Plus has also proven to involve the point of view of online users. For instance, the keywords consist of the user experience, younger generations, Malaysian, as well as user interfaces.

Figure 3. WordCloud from (a) Author's Keyword and (b) Keyword Plus.

The details for both keyword types are tabulated in Table 2. The number of frequencies counted from the Keywords Plus is higher than Author's Keywords. This pattern is related to the method used to count keywords for Keywords Plus. Keywords Plus is created by combining the

title, abstract, and reference lists from the article (Aria & Cuccurullo, 2017). As a result, Keywords Plus represents a broader set of keywords than the Author's Keyword.

Table 2. Details for both keyword types.

Author's Keywords			Keywords Plus		
Frequency	**Terms**	**Cluster**	**Frequency**	**Terms**	**Cluster**
30	cultural heritage	cultural heritage	51	cultural heritages	cultural heritages
2	3d printing	cultural heritage	23	historic preservation	cultural heritages
2	3d scanning	cultural heritage	7	digital storage	cultural heritages
15	intangible cultural heritage	intangible cultural heritage	18	virtual reality	virtual reality
6	digital preservation	intangible cultural heritage	12	virtual heritage	virtual reality
3	tangible cultural heritage	intangible cultural heritage	7	architecture	virtual reality
13	Malaysia	Malaysia	11	Malaysia	Malaysia
12	heritage	Malaysia	6	Malaysians	Malaysia
6	culture	Malaysia	5	cultural heritage	Malaysia
13	virtual heritage	virtual heritage	8	augmented reality	augmented reality
10	virtual reality	virtual heritage	6	museums	augmented reality
4	classification	classification	5	human computer interaction	augmented reality
2	filling	classification	7	ontology	ontology
2	image processing	classification	6	intangible cultural heritages	ontology
4	information retrieval	information retrieval	5	cultural heritage preservation	ontology
3	digital resource objects	information retrieval	6	photogrammetry	photogrammetry
4	mobile augmented reality	mobile augmented reality	5	image processing	photogrammetry
2	conceptual model	mobile augmented reality	3	mapping	photogrammetry
2	cultural heritage site	mobile augmented reality	7	three-dimensional computer graphics	three-dimensional computer graphics
3	photogrammetry	digital cultural heritage	5	image reconstruction	three-dimensional computer graphics
3	terrestrial laser scanning	digital cultural heritage	4	laser applications	three-dimensional computer graphics
3	virtual museum	digital cultural heritage	2	conceptual frameworks	conceptual frameworks
3	identity	identity	2	cultural heritage information	conceptual frameworks
2	batik	identity	2	knowledge-sharing	conceptual frameworks
2	challenges	identity			
2	3d modeling	3d modeling			
2	cultural heritage tourism	cultural heritage tourism			
2	penang	cultural heritage tourism			
2	digital puppetry	digital puppetry			
2	malaysian shadow play	digital puppetry			
2	wayang kulit kelantan	digital puppetry			

| 2 | information technology | information technology | |
| 2 | tourist satisfaction | information technology | |

Further analysis on the keywords showed that the number of clusters for Author's Keywords is higher than the Keywords Plus. As listed in Table 2, the clusters are divided into 13 different clusters for Author's keywords while only 8 clusters for Keywords Plus. In general, both keywords' categories are related to the cultural heritage(s), Malaysia as well as the digital cultural heritage applications. Again, applications such as virtual heritage, augmented reality, or mobile augmented reality are among the main keywords in the literature. In Author's Keywords, the digitization of cultural heritage is important for information retrieval which is believed to assist museums or related institutions to preserve the identity of Malaysian society as well as to contribute to heritage tourism or cultural heritage tourism. The other important clusters indicate that the information technologies, 3D modeling, as well as digital puppetry, are related issues with the implementation of digitization technologies in cultural heritage.

The Keywords Plus also highlighted the digitization technologies such as photogrammetry, three-dimensional computer graphics which are required for the enhancement in image processing procedures. Furthermore, the conceptual framework which is related to the quality of 3D reconstructed models also is emphasized in Keywords Plus. Similar to the Malaysian identity, Keywords Plus extended the cluster with ontology which can be used to guide the analysis process and supports the detection of certain concepts defined in the domain ontology (Sharma & Siddiqui, 2016). According to the literature, digital cultural heritage has been proven to benefit both cultural heritage and society (Bekele et al., 2018). For instance, Europeana is the great European digital library that contains over 30 million objects which represent 10% of the available digital cultural heritage in Europe (Bachi et al., 2014). EuropeanaPhotography (Truyen & Waelde, 2016), Europeana Space, RICHES, and PREFORMA (Bachi et al., 2014) were among the funded projects by the European Commission to digitize the cultural heritage. The projects are beneficial for society with easy access. Such projects should be initiated in Malaysia which also can attract society to learn more about cultural heritage and maintain the identity of various ethnicities in Malaysia.

The co-occurrence network of the most frequently used Author's Keywords is illustrated in Figure 4. The network can be analysed according to the bubble size and the line thickness as well as the colour. In general, the bubble size refers to the total number of highly cited documents while the line thickness and colour refer to the link strength and cluster, respectively (Zhang et al., 2019). Figure 4 showed that there are more research works can be done according to the bubble size and line thickness. For instance, 3D printing, virtual environment, mobile augmented reality, digital storage, digital cultural heritage, filing, digital resource objects, architectural heritage or tangible cultural heritage. The digitized cultural heritage versions facilitate new means of access and enable the use of materials that are not possible with the analogue form (Xie & Matusiak, 2016).
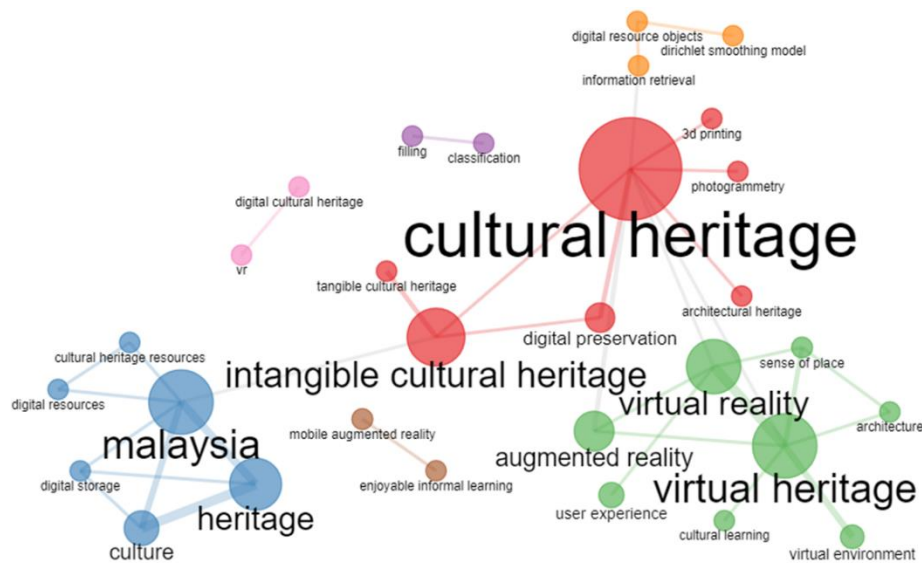
Figure 4 The co-occurrence network for Author's Keywords

Themes analysis

The keywords analysis based on the cluster of the Author's Keywords can be expanded to identify the themes of the digitization of cultural heritage in Malaysia. The themes analysis is illustrated by plotting the development degree (Density) against the relevance degree (Centrality) as shown in Figure 5. Centrality is the degree of interaction of the research theme with other research themes while density is the internal strength of research themes (Callon et al., 1991).

Based on the four themes, it can be used to predict the status and future research areas for the digitization of cultural heritage in Malaysia. The future of digital cultural heritage research areas can be identified by analysing the topics in Emerging and declining Themes. Digital puppetry (Cluster 12) is in this theme which might be an important theme in the nearest future, or it can be neglected when more research has been conducted. This is because the topic listed in this theme is weakly developed (low density) and marginal (low centrality) (Herrera-Viedma et al., 2016).

The theme in Basic Theme is low density and high centrality indicates that the research topic under this theme is weakly developed but considered important themes in the research field. For instance, the clusters such as intangible cultural heritage (Cluster 2), virtual heritage (Cluster 4), information retrieval (Cluster 6) and mobile augmented reality (Cluster 7) are presented in this theme. Based on Figure 5, the clusters in Basic Theme required further research works which need to provide better research value in digitization cultural heritage. In addition, the capability of digital cultural heritage as real-photorealistic models increases the potential applications (Abdelhafiz & Mostafa, 2020).

Motor Theme is considered the unification of the knowledge and journal due to high density and centrality (Della Corte et al., 2019). The clusters in this theme are a cultural heritage (Cluster 1), Malaysia (Cluster 3), digital cultural heritage (Cluster 8), identity (Cluster 9), and cultural heritage tourism (Cluster 11). The niche Theme is in the high density and low centrality. This indicates that the Niche theme is only limited to the research field (Della Corte et al., 2019). This theme is less important in the digitization of cultural heritage, but the many works show high strength in the internal ties. For instance, the cluster of classification and information technology in Cluster 5 and 13, respectively.
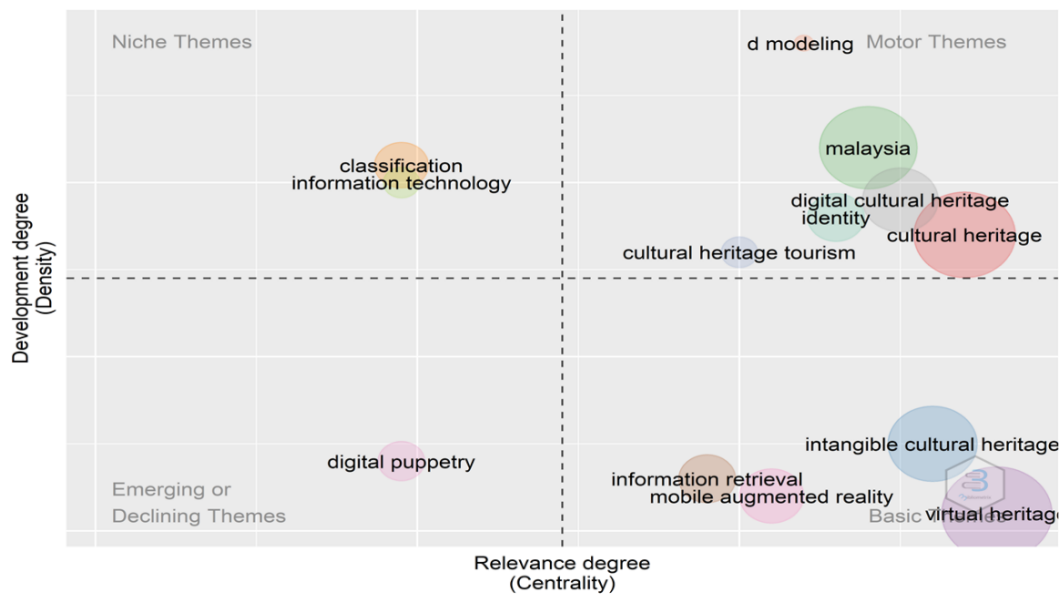
Figure 5. Themes analysis based on the cluster of Author's Keywords.

Based on the theme analysis using the Author's Keywords, it is important to monitor the research trends frequently. The Author's Keywords are essential types to obtain the research trends which is useful for monitoring the research development (Chen et al., 2021). The clusters present in the themes will continually change over time as the research continues.

Network analysis

Network analysis is performed to map the scope and structure of the discipline while discovering key research clusters (Fahimnia et al., 2015). Two important network analyses are the co-citation of the authors as well as the institution collaboration as shown in Figure 6 and Figure 7, respectively.

The co-citation of the authors with a minimum of at least 2 papers is shown in Figure 6. Tan K, Lim C, Woods P and Thwaites H are among the top 4 authors in co-citation analysis regarding the digitization of cultural heritage. The main principle of co-citation is that more than two documents are co-cited, which likely discuss the same research issue (Farrukh et al., 2020).

The most active institution collaborations are between Universiti Teknologi Mara, Multimedia University and Universiti Kebangsaan Malaysia. These three universities had a large size of bubbles that indicates a high number of occurrence of institutions collaborations with other institutions. In general, Figure 7 also shows that almost all universities in Malaysia had involved in the digitization of cultural heritage research. However, the small size lines signify the collaboration networks between each institution are still low. The low strength line thickness on the digitization of cultural heritage indicates that this research area hasn't reached full maturity in terms of scientific knowledge.
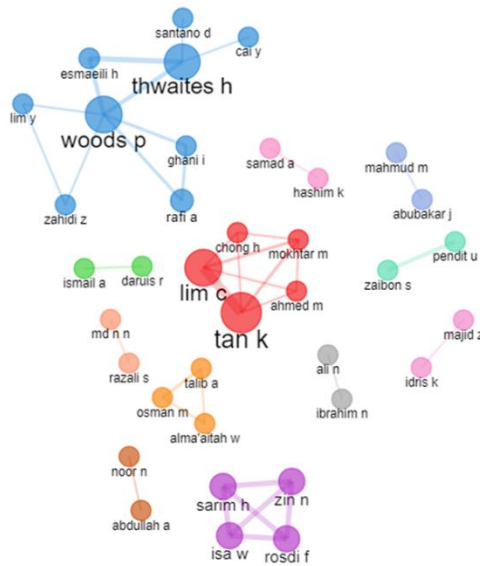
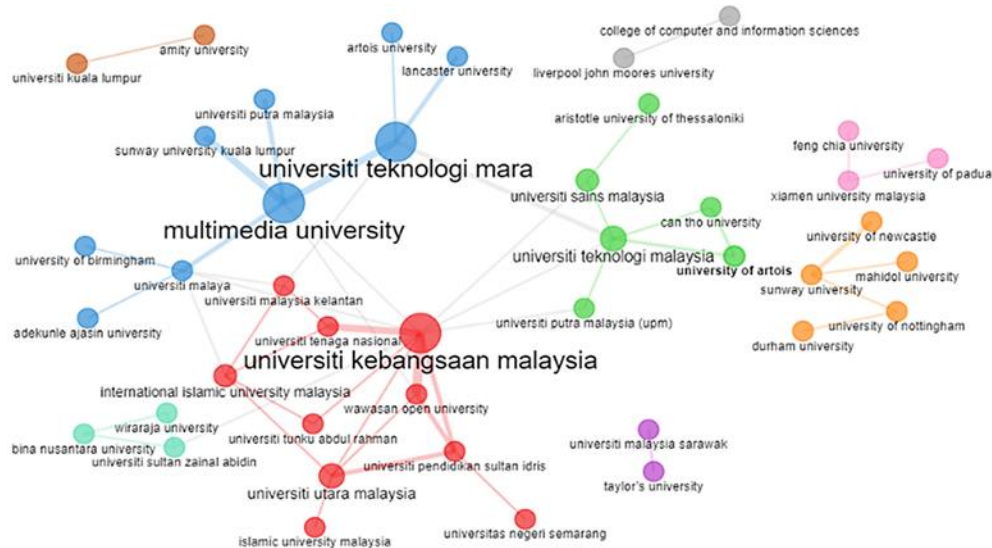**Figure 6.** Network analysis of co-citation of the authors.

Figure 7. Network analysis of institutions collaboration.

Future recommendations: post-Covid-19

The Covid-19 situation causes the digitization implementation in cultural heritage to become significant. The economic system and mindset due to the Covid-19 has been guiding and shaping the response and recovery strategies of governments, institutions, businesses and related peoples for post-Covid-19 (Sigala, 2020). This becomes an opportunity to introduce diverse digital applications which is beneficial to museums and related institutions as well as to enhance the promotion of cultural heritage. Digital cultural heritage applications such as virtual reality, augmented reality in a virtual environment for digital tourism can be an alternative solution to continue the tourism and also hospitality industry. Furthermore, these digital interaction formats will be part of a new regime in academic sharing or exchange. For instance, this new digital

interaction format has successfully substituted physical activities such as conferences during the Covid-19 pandemic (Schwarz et al., 2020). Future research should create digital applications with valuable end-user benefits. Finally, it is important to ensure the digital cultural heritage still can retain the original criteria of cultural heritage.

Conclusion

This paper investigated the academically published articles on the implementation of digitization in cultural heritage in Malaysia. Bibliometric analysis was used to assist the assessment of the status of the research. Web of Science and Scopus database enables the mapping of digital cultural heritage trends within 15 years of publication. The findings show that the digitization in cultural heritage started in 2007 and the quantity of publications is kept growing since then. The database analysis on the document, keywords, networks revealed more details about the research. The analysis can determine the preferable type of document, highly cited articles, co-citation articles and institutions in Malaysia as well as from abroad involved with the digitization cultural heritage. Based on the bibliometric analysis, the current status of digitization of cultural heritage in Malaysia needs to be strengthened in order to protect the cultural heritage as well as the museum institutions themselves. The current Covid-19 pandemic negatively impacts physical activities but the implementation of digitization in cultural heritage provides new applications for post-Covid-19 recovery plans. The successful digitization projects funded by European Commission are proven evidence and should motivate the Malaysian government and local researchers in digitization cultural heritage. The digitised projects are benefited to cultural heritage tourism, sustainability as well as contribution to the economy.

Acknowledgements

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Full length article

Circular economy strategies for adaptive reuse of cultural heritage buildings to reduce environmental impacts

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ARTICLE INFO	ABSTRACT
	Circular economy strategies seek to reduce the total resources extracted from the environment and reduce the wastes that human activities generate in pursuit of human wellbeing. Circular Economy concepts are well suited to the building and construction sector in cities. For example, refurbishing and adaptively reusing underutilized or abandoned buildings can revitalize neighborhoods whilst achieving environmental benefits. Cultural heritage buildings hold a unique niche in the urban landscape. In addition to shelter, they embody the local cultural and historic characteristics that define communities. Therefore, extending their useful lifespan has multiple benefits that extend beyond the project itself to the surrounding area, contributing to economic and social development. To explore this complex issue, the research applies systematic literature review and synthesis methods. Decision makers lack knowledge of the environmental benefits of adaptive reuse of cultural heritage buildings and lack tools to implement these projects. A new comprehensive circular economy framework for the adaptive reuse of cultural heritage buildings to reduce environmental impacts intends to meet these needs. The framework integrates methods and techniques from the building and construction literature that aim to reduce lifecycle environmental impact of buildings with a circular product supply chain approach.

1. Introduction

Today's city planners and city dwellers desire environmentally sustainable and vibrant communities. Resourceful and innovative approaches for the built environment in general and existing buildings in particular are key to accomplishing future sustainability. Urban cultural heritage buildings are of particular interest because they may be underutilized or abandoned; nevertheless, are important for the heritage of local, and possibly international, communities. The unique historic and cultural characteristics of the building(s) are their "heritage". Heritage extends beyond the project itself to the surrounding area, is often a public or common good, and is recognized for contributions to the economic and social development of the area (Guzmán et al., 2017; Hosagrahar et al., 2016; Rypkema and Cheong, 2011; Throsby, 2009; Vileniske, 2008; Zhang, 2010). Cultural heritage[1] buildings can be former places of religious worship, aristocratic/royal residences, community meeting places, industrial production sites, early modern office buildings, or military objects. It is important to seek sustainable solutions for these buildings in urban development.

A solution proposed by this paper is a comprehensive circular economy (CE) framework for the adaptive reuse of cultural heritage buildings based on a synthesis of the literature. The proposal integrates methods and techniques from the building and construction literature that reduce environmental impact of buildings over their lifecycle with the goals of adaptive reuse of cultural heritage buildings. An adaptive reuse of a cultural heritage project is the retrofit, rehabilitation and redevelopment of one or more buildings that reflects the changing needs of communities. Cultural heritage projects include both legally protected (listed) and unprotected buildings. Although the original purpose of a building is no longer continued, the goal of the project is to maintain the building's distinct historic and cultural character (Binder, 2003). Experts may judge if cultural heritage values are sufficiently preserved (Forsyth, 2013). These projects are often the keystones of unique urban neighborhoods worldwide (Boeri et al., 2016; Girard, 2014; Yung et al., 2017).

This research is motivated by four drivers found in the literature: 1) The CE is a new and compelling strategy to achieve a sustainable economy; 2) The building and construction industry's crucial role in

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[1] "Cultural heritage is an expression of the ways of living, developed by a community and passed on from generation to generation, including customs, practices, places, objects, artistic expressions and values. Cultural heritage is often expressed as either intangible or tangible cultural heritage." ICOMOS, I.I.C.o.C.T. (2002). ICOMOS international cultural tourism charter: principles and guidelines for managing tourism at places of cultural and heritage significance. International Council on Monuments and Sites, ICOMOS International Cultural Tourism Committee.

human well-being and high environmental impact; 3) Urbanization trends worldwide underscore sustainable urban planning research; and 4) The existence of significant cultural heritage resources embodied in buildings in urban centers and their potential role in sustainability. The confluence of these drivers for adaptive reuse of cultural heritage sites is an opportunity recognized by the EU Horizon 2020 funded project "Circular models Leveraging Investments in Cultural heritage adaptive reuse" (CLIC),[2] under which this study was undertaken. CLIC's foundation is the thinking of Luigi Fusco Girard and Antonia Gravagnuolo (Girard, 2014; Girard and Gravagnuolo, 2018). Similar themes are acknowledged in the EU Horizon 2020 funded project, "Buildings as Material Banks".[3] The four drivers are briefly described as follows.

1.1. Circular economy

The realization that human activities have caused environmental degradation, destruction of habitats and alterations to ecosystems that endanger human wellbeing, has led to the pursuit of more sustainable strategies, such as the CE (Bruce et al., 1996; EMF, 2013; Korhonen et al., 2018). The common understanding of a product supply chain in economics is linear. A linear supply chain processes natural resources into products that support human wellbeing. Consumers use these products and subsequently dispose them as waste. A CE supply chain model stands in contrast to a linear economy model. There are many definitions of CE in use with different theoretical underpinnings (Kirchherr et al., 2017; Reike et al., 2017). There is no single best option for CE strategies. Many circularity strategies are complimentary and also fit to varying industrial and societal contexts (Moreau et al., 2017) To avoid ambiguity, the current work defines CE and CE strategies as follows.

Circular Economy is a production and consumption processes that require the minimum overall natural resource extraction and environmental impact by extending the use of materials and reducing the consumption and waste of materials and energy. The useful life of materials are extended through transformation into new products, design for longevity, waste minimization, and recovery/reuse, and redefining consumption to include sharing and services provision instead of individual ownership. A CE emphasizes the use of renewable, non-toxic, and biodegradable materials with the lowest possible life-cycle impacts. As a sustainability concept, a CE must be embedded in a social structure that promotes human well-being for all within the biophysical limits of the planet Earth.

1.2. Environmental impacts of buildings

The need for shelter is irrefutably critical to human well-being. The subsequent manufacture, use, and disposal of buildings for shelter is conducted on a massive scale, causing significant consumption of natural resources extracted from the environment and wastes returned to the environment. This demand makes the construction industry the largest consumer of resources and raw materials globally (WEF, 2016). Furthermore, the building industry's greenhouse gas emissions tied to global climate change have risen steadily. The International Energy Agency recently noted that there was a 45% increase in building related emissions since 1990 (IEA 2017). These facts make managing the environmental impacts of buildings, particularly greenhouse gas emissions, critical to achieving a sustainable economy and limiting global warming. In October 2018, the International Panel on Climate Change (IPCC) reviewed options for limiting global warming to 1.5 °C above pre-industrial levels. The IPCC noted that rapid changes to the building sector would be necessary to meet this goal (Rogelj et al., 2018). In 2017, the International Energy Agency unequivocally stressed the

daunting sustainability challenge and opportunity of the building sector by stating, "More efficient buildings support the whole energy system transformation." (OECD/IEA, 2017)

1.3. Sustainable urban development

How to sustainably build and manage cities with expanding populations is a vibrant area of research that crosses several academic disciplines such as architecture, economic policy, planning and economics (Andersson, 2006; Hassan and Lee, 2015; Hoornweg and Freire, 2013; Lehmann, 2010, 2011; Lehmann, 2013; Lewin and Goodman, 2013; Quintero, 2013; Rodwell, 2011; Wolch et al., 2014). According to the United Nations' 2018 estimates, fifty-five percent of humans now live in cities (United Nations, 2018). This is an upward trend in many countries (Habitat, 2016). The United Nations' *Urbanization and Development: Emerging Futures* report sets out the following principle "Promoting environmental sustainability… [that] can lead to transformative change when a critical connection is established between environment, urban planning and governance…" (Habitat, 2016) The sustainable urbanization discussion broadly includes culture at the international and regional governmental levels. For example, UNESCO started the "Culture for Sustainable Urban Development Initiative" in 2015. The United Nations Sustainable Development Goal 11, "Make cities and human settlements inclusive, safe, resilient and sustainable", includes the target "Strengthen efforts to protect and safeguard the world's cultural and natural heritage".[4] Likewise, the Urban Agenda for the European Union (Pact of Amsterdam) established in 2016 incorporates cultural heritage as a major aspect of urban development.

Although not all cultural heritage buildings are located in urban areas, the majority of buildings that adaptively reused in future are concentrated in cities. They are critical to sustainable urban development.

1.4. Cultural heritage builds cities

Cultural heritage is a resource for economic development and place-making movements in urban areas worldwide (Montgomery, 2003; Richards, 2011). For example, major cities, e.g. Paris, Vienna, New York and Dubai, have historic districts that preserve cultural history, anchor functioning commercial districts and attract tourists. "Historic cities possess assets of both cultural and economic values, with high potential for growth in a sustainable perspective." (Girard, 2014) Additionally, cultural heritage sites may or may not be ancient. For example, modern skyscrapers are cultural hallmarks in Malaysia and Hong Kong. Increasingly, culture, cultural heritage and cultural heritage sites and their contributions to sustainable development are the focus of investigation (Dessein et al., 2015; Guzmán et al., 2017; Hill, 2016; Melo, 2012; Soini and Dessein, 2016; Throsby, 2017; Vélez et al., 2016; Wright and Eppink, 2016). Barthel-Bouchier's book Cultural Heritage and the Challenge of Sustainability is a cogent synopsis of the is emerging field (Barthel-Bouchier, 2016). The 2011 UNESCO report, "Recommendation on Historic Urban Landscape" describes the historic urban landscape as follows:

"The historic urban landscape is the urban area understood as the result of a historic layering of cultural and natural values and attributes, extending beyond the notion of "historic centre" or "ensemble" to include the broader urban context and its geographical setting. This wider context includes notably the site's topography, geomorphology, hydrology and natural features, its built environment, both historic and contemporary, its infrastructures above and below ground, its open spaces and gardens, its land use patterns and spatial organization, perceptions and visual relationships, as well as all other elements of the urban structure."

The UNESCO recommendation demonstrates that the international community is framing the culture and urbanity debate as complex and intertwined.

1.5. The adaptive reuse nexus

Adaptive reuse of cultural heritage buildings stands at the nexus of the major trends described above and is inherently complex. The significance of the topic is increasingly recognized (Alikhani, 2009; Aytac et al., 2016; Boeri et al., 2016; Bullen and Love, 2011a,b; Camocini and Nosova, 2017; Hein and Houck, 2008; Ijla and Broström, 2015; Rodrigues and Freire, 2017; Wong, 2016). As a nexus issue, adaptive reuse of buildings (with or without cultural heritage values) in urban settings requires transdisciplinary thinking. The transdisciplinary approach taken here draws upon knowledge across disciplines to solve a common multi-faceted problem (a nexus issue).

Current research establishes the environmental benefits from adaptive reuse of buildings, albeit the benefits are not widely espoused in practice. Studies on individual buildings and meta-analyses find significant reductions in energy consumption and related carbon dioxide and other greenhouse gas emissions, fossil fuel consumption, fresh water consumption, and materials use. Multiple analyses concur that adaptive reuse of existing buildings are beneficial for the environment (Assefa and Ambler, 2017; Baker et al., 2017; Bullen and Love, 2010; Elefante, 2007; Kubbinga et al., 2017; Munarim and Ghisi, 2016; Thornton, 2011). The main driver of environmental benefits in the literature is "embodied energy", which is the cumulative energy inputs that were required to construct the building initially (Hammond and Jones, 2008) and process/operational energy consumed during the building's use (Cabeza et al., 2013). Embodied energy calculated as carbon dioxide avoided by reuse, or the carbon dioxide equivalent of the energy and materials used to construct the existing building, takes advantage of a buildings' longevity. The life of buildings in cities can span hundreds of years. Even modern concrete and steel buildings may have considerable lifespans, depending upon maintenance. An important caveat is that although studies show environmental benefits, realizing these benefits is not guaranteed. First, reuse of existing buildings may not completely reduce the need and desire for new construction. For example, spillover effects may result in more buildings being built overall rather than less (Cooper and Gutowski, 2017). Second, the adaptively reused cultural heritage building could fall short of today's expected standards (Bullen and Love, 2011a), for example in comparison to zero-emission buildings. Third, circular strategies and adaptive reuse strategies are perceived as more expensive alternatives to demolition and new construction regardless of environmental and sustainability benefits (Bullen and Love, 2011a; Debacker and Manshoven, 2016) Despite these caveats, the conclusion stands that adaptive reuse of cultural heritage buildings is a win for the environment.

The comprehensive CE framework for the adaptive reuse of cultural heritage buildings proposed herein is original because it aggregates and synthesizes key learnings from disparate sources. In doing so, a new tool is created that may be used for setting strategy, assessment of projects, assessment of government policies, and awareness raising. It is an appropriate strategy for a nexus issue. Building users, project managers, architects, city planners, etc. may also use this framework for collaborative brainstorming. The framework explicitly targets construction industry practitioners of cultural heritage adaptive reuse in addition to academics with the purpose of encouraging more implementation of adaptive reuse strategies across the supply chain. Although the paper addresses a niche, it is relevant to the wider research fields of CE and the general buildings sector.

To understand the importance of the proposed framework and its applications it is important to place it in the context of an ongoing discussion about adaptive reuse of buildings. Section 2 describes the methodology used to bring together diverse fields of research. Section 3 discusses the relevant literature. Section 4 discusses the framework that resulted from this research. Section 5 concludes with thoughts on future research directions.

2. Research methodology

The research methodology consisted of four steps as illustrated in the conceptual framework (Fig. 1): 1) conducting a literature review; 2) selecting a CE framework appropriate to the topic; 3) defining the phases of the buildings life-cycle that best reflects the elements of the industry and possible interventions to realize a CE model; and 4) synthesizing discreet interventions from the literature according to the new model with the goal of achieving fewer material resources consumed and positive environmental outcomes at each phase.
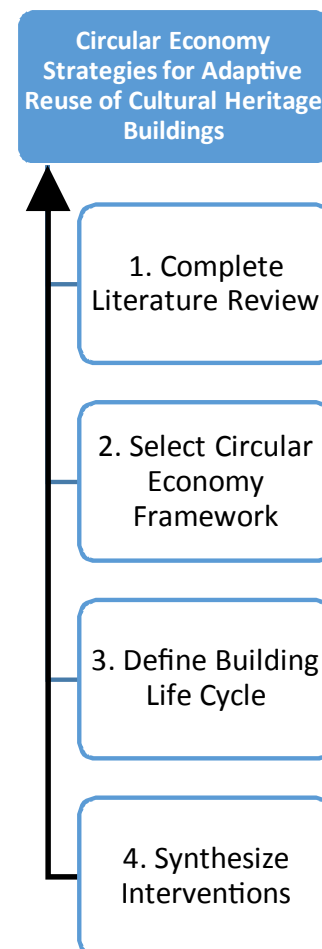

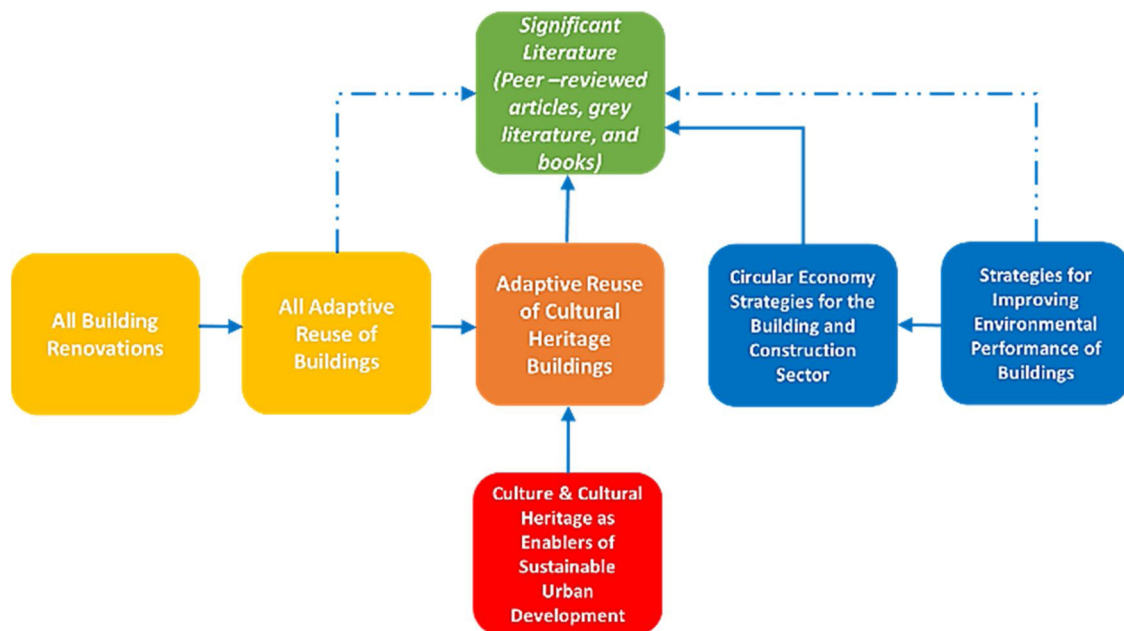**Fig. 1.** Conceptual framework of the study.

Fig. 2. The literature review process identified the niche of significant literature (green rectangle) (for interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article).

1) A structured and iterative literature review process was necessary because the topic is new and a niche within a large field of published works. This study relies on secondary sources of evidence; therefore, a rigorous and extensive literature review was crucial. The search for significant and relevant literature lasted from March to September 2018. The literature search of peer-reviewed journal papers and published books utilized several databases (Science Direct, Google Scholar, and Web of Science). In addition, a Web of Science Search Alert was employed between March and August 2018. The key words used to conduct the searches were: "adaptive reuse", "circular economy", "adaptive reuse of cultural heritage", "buildings and construction", "environmental impact assessment", "sustainability assessment", "urban renewal", "construction", "built environment", and "green building". Reference lists from the original set identified additional papers. Moreover, internet searches with Google and Bing identified supplementary grey literature.

The main goal of the literature review process, presented in Fig. 2 was to unearth the most relevant publications whilst excluding the general publications. As Fig. 2 illustrates, the process began with a review of several broad genres and ended with a relatively small body of relevant and significant literature comprised of peer-reviewed journal articles, grey literature and books (shown by the green box). The graph also shows the genres that are beyond the scope of this study. The general building retrofitting/rehabilitation genre is extensive and outside the scope of this study (first yellow box on the left-hand side). The general publications on adaptive reuse of buildings and strategies for improving environmental outcomes of buildings contribute to this niche. However, this genre goes beyond the study's purpose so a dashed line represents this genre's contribution. Likewise, the literature on strategies to improve the environmental performance of buildings (blue box on the right with dashed blue line to green box) contributes, but is generally beyond the scope of this study. The categories with direct relevance to this study are: 1) Adaptive reuse of cultural heritage buildings; 2) Circular economy strategies for the building and construction sector; and 3) Culture and cultural heritage as enablers of sustainable urban development.

The publications identified by the literature review were segregated into two groups according to their use in the study. The first group is relevant papers that serve as the corpus to which this paper contributes.

Section 3.2 describes these individually in the literature review. Second, the literature review identified a group of documents, which serve as source material for the strategies in the framework. Several documents served both purposes.

Most important, how to determine the cultural heritage values attached to a building is outside the scope of the framework. There are many competing doctrines in the field. Determining cultural heritage values is an art and science that is inherently site-specific. The first assumption is that users of the framework for cultural heritage buildings will have already independently assigned cultural heritage values to their unique projects. Second, because there are many definitions and frameworks for CE in use today, it was important to write a clear definition for CE (See Section 1) and select a framework with a scope and scale suitable to the topic. Several CE frameworks and definitions use variations of the well-known Reduce, Reuse, Recycle rubric often referred to as "Rs" (Kirchherr et al., 2017; Sauvé et al., 2016). Some apply the Rs, but do not include longevity in their scope, instead focusing on manufacturing level efficiencies. Other frameworks do not include end-of-life wastes within their scope. Kirchner et al. concluded that only a third of [one hundred and fourteen CE] definitions explain a waste hierarchy (Kirchherr et al., 2017). Building longevity and overall waste reduction are critical for the buildings and construction industry. Furthermore, it was important to hone in on the scale as regards adaptive reuse of urban buildings (regardless of cultural heritage). The scale of a CE conceptualization can target the micro level, the meso level or the macro level. For example Qian and Wang's explication of the "circular economy city" concept is a meso-level approach (Qian and Wang, 2016). This report takes a micro level approach focusing on a project (which may include more than one building) as the desired scale. The micro level scale is commensurable with the perspective that a given building is a *product* that supplies services to humans, namely shelter and health. Therefore, a product supply chain perspective is necessary. The paper "Circular Economy: Measuring Innovation in the Product Chain" (Potting et al., 2017), a publication of the Netherlands Environmental Assessment Agency (PBL), was chosen as the circularity framework for this research because it is in-depth, well-researched, and credible. See Fig. 3. CE framework for the topic. The analysis was framed and guided by the PBL paper. The paper introduces circularity strategies (R0-R9) that apply to product supply chains as part of an

Circularity strategies within the production chain, in order of priority
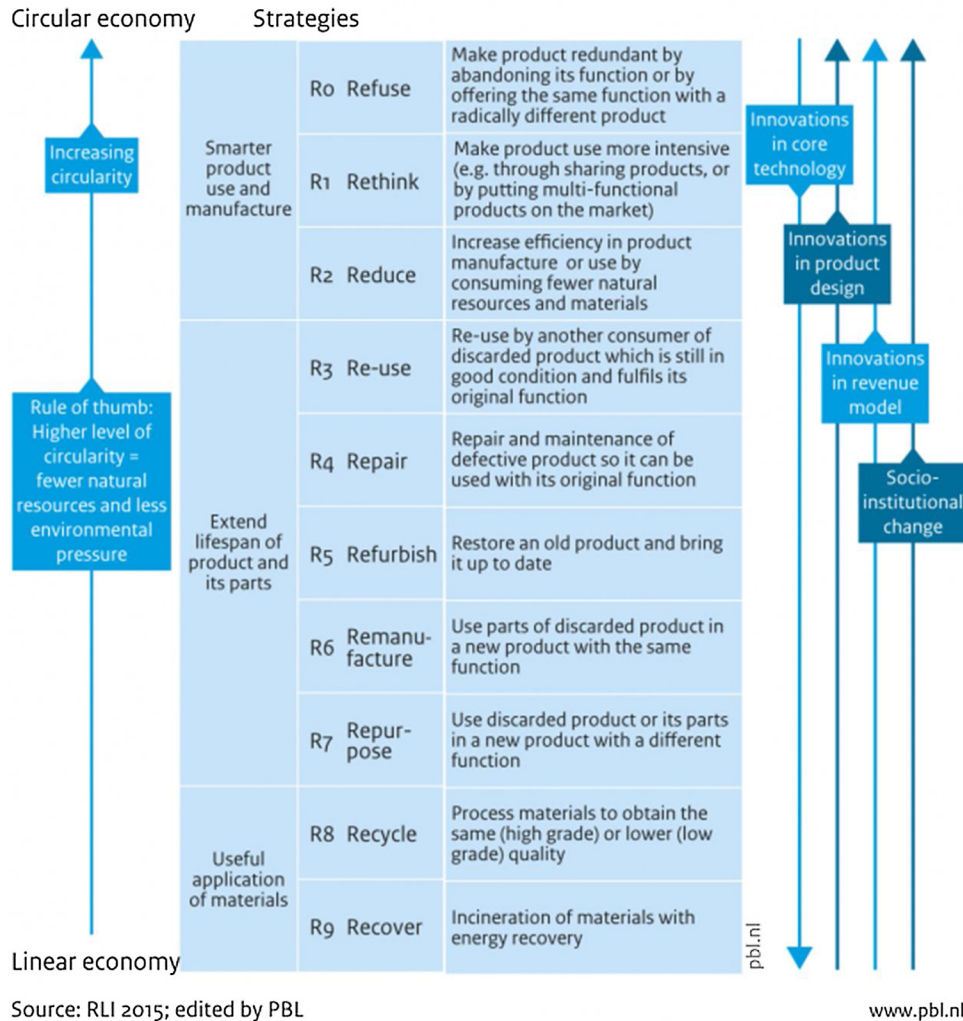

Source: RLI 2015; edited by PBL

www.pbl.nl

Fig. 3. Circularity strategies Employed for Adaptive Reuse of Cultural Heritage Buildings (reproduced with permission).

overall transition from a linear economy to a CE. The PBL graphic from (Potting et al., 2017), is reproduced here with permission under its Creative Commons License.[5]

Third, based on the literature and the principals of life cycle analysis, phases of a buildings' lifespan were defined to facilitate mapping CE strategies as interventions/ practices at each phase. The outcomes of Steps 2 and 3 resulted in Step 4 (Synthesis of the literature), which is presented in Section 4.

3. Literature review

The literature review provided understanding of the nuances of the field to identify research needs and relevant literature. This section provides the main results of the literature review. The research needs that this analysis aims to address are described in Section 3.1. The relevant papers, grey literature, and books that are considered the state-of-the-art (collectively) are compared to the present study in Table 1 of Section 3.2.

3.1. Research needs

Overall, the literature demonstrates that adaptive reuse of buildings aligns with CE goals and new research is needed in the field. In particular, research that explains the alignment between reuse of buildings and CE would be useful to practitioners in the industry. Three clear research gaps were discerned from the literature as follows.

1) Although the CE discourse is rapidly expanding, implementing CE is hampered by a lack of knowledge about what CE is and how to implement it, in general, and in the buildings sector. Recent analyses of the state of the art have found that "methodologies for delivering a CE are even more blurred and uncertain." (De Jesus and Mendonça, 2018) and that barriers include "Inadequate awareness, understanding and insight into CE in [construction and demolition] C&D waste management."(Mahpour, 2018) The results of Adams et al.'s survey make a compelling argument that adopting CE in the construction industry is challenged by a lack of awareness, "clients, designers and subcontractors" are the least informed (Adams et al., 2017). The proposed framework is intended as an intervention to raise awareness and skills at the micro-level. Ghiselini et al. 2016 defines fields of intervention at the micro-level in CE as firms and customers, the meso-level as industrial parks, and macro-level as cities, regions or nation (Ghisellini et al., 2016). Here, buildings

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[5] The graphic is available at http://www.pbl.nl/en/infographic/circularity-strategies-within-the-production-chain-in-order-of-priority.

represent the micro-level and the intervention is providing useful knowledge to actors (cultural heritage managers, architects, civil engineers, building owners, contractors, city planners, etc.) engaging in adaptive reuse of cultural heritage buildings.

2) The literature on CE in construction tends to be fragmented, focusing on one phase of the supply chain, usually end-of-life. At this phase, the main focus is often reducing construction and demolition waste to landfill through recycling and reuse (Adams et al., 2017). Ghisellini's thorough literature review paper identified 70 academic papers on C&D wastes (Ghisellini et al., 2017). The papers that take a lifespan approach tend to narrow down environmental impact to embodied energy and greenhouse gas emissions (Pomponi, 2016). In contrast, the current work addresses this gap by proposing a coherent and comprehensive framework that identifies circularity strategies at each phase of the building supply chain for a range of environmental outcomes including, energy efficiency, climate change adaptability, water efficiency, for example. This is a unique approach.

3) The academic CE literature is focused on barriers, general methods of measurement such as Life Cycle Analysis, and technological proposals for closing material loops such as block chain applications. The academic CE literature avoids specific actions and activities that project managers can take to implement CE. Meanwhile, "Design tools and guidance" were identified as one of the "most significant enablers for implementing [CE in construction] industrywide" (Adams et al., 2017) Further, De Jesus and Mendonça found that "On the whole, the academic literature still seems focused on the role of technological innovation in the transition towards a CE." (De Jesus and Mendonça, 2018) This is a critical gap because the role of managing and applying technological innovation at the micro level is often neglected. CE needs to be "brought down" from the macro to the micro level. CE literature rarely focuses on the strategies and actions at the micro level. For the buildings and construction sector, the micro-level strategies are found in the architectural, retrofitting, rehabilitation and design literature, not in the CE literature. This study weaves these threads together by highlighting specific strategies that implement CE.

The three research gaps defined above confirm the need for the proposed explicitly circular strategies aimed at reducing the environmental impacts of cultural heritage buildings.

3.2. Overview of relevant literature

Table 1 describes several publications that collectively represent today's state-of-the-art and lay the groundwork for the current study. Eight papers, three reports (grey literature), and two books are included.

4. Results: circular economy strategies for adaptive reuse of cultural heritage buildings

This section presents and the main findings of the analysis. Section 4.1, describes the building life cycle defined herein. Section 4.2 highlights participants at each phase that use the framework. Section 4.3 presents and discusses the components of the framework and demonstrates how each strategy promotes circularity. Section 4.4 discusses the study's challenges and limitations.

4.1. Defining the building life cycle

As discussed in the methodology section, the framework intends to transform a linear product supply chain to a circular product supply chain for buildings in order to capture the environmental benefits of adaptive reuse discussed in the Introduction. Step 3 of the methodology, "Defining the Building Life Cycle" as a linear product supply

chain is not trivial. No uniform method for defining a product supply chain for buildings exists, even when applying LCA methodologies. Moreover, defining the building life cycle in question defines the opportunities and constraints of the interventions/actions that implement the CE framework (the R0-R9 strategies).

The framework goes beyond many life cycle analyses in the buildings and construction sector, which are cradle to gate, meaning that they begin with the resource extraction and end with construction. Another way to organize a life cycle analysis is cradle to cradle, which means considering the environmental impacts at the very beginning and the very end of a product's useful life. This research (although not an LCA) takes a cradle-to-cradle perspective. This point is important because Pomponi and Moncaster's analysis of LCA's on embodied carbon mitigation in the built environment demonstrated that many LCA's were incomplete. They state, "Impacts during the occupancy stage and at the end of life of a building are often totally overlooked." (Pomponi and Moncaster, 2016) This framework avoids this mishap. Munarim et al. decided that rehabilitation was a "new stage" in existing buildings life cycle" (Munarim and Ghisi, 2016). The framework does not take this approach, instead establishing rehabilitation as a CE strategy analogous to refurbishing (R5). Similar to other research in the field, the framework includes Design as a distinct phase of the building life cycle (Debacker and Manshoven, 2016; Ghisellini et al., 2017). This is important because Design is critical to how buildings are ultimately realized, used, adapted, reused and demolished. Owing to the large scale of building projects, the design directly drives the materials and resources extracted from nature because major layers of buildings, such as the façade and windows, are bespoke. Nevertheless, the Design phase is frequently left out of a building's supply chain in LCAs, being conflated with Building Materials Sourcing. For these reasons, the proposed framework designates Design and Building Materials Sourcing as separate phases. The building life cycle defined in this study is familiar. Its phases are based on common understandings of LCA analysis; though it strives to be more inclusive than is usual to assimilate a broader range of environmental impacts and circularity strategies. Fig. 4 explains the building life cycle phases for this study as a linear product supply chain to illustrate and emphasize the traditional (non-circular perspective).

4.2. Participants in the building life cycle

The principles of stakeholder engagement and inclusiveness are critical to theories of sustainable development, modern architecture, and urban planning. Therefore, potential users of the framework at each stage of the building cycle are an important audience for this work. Potential framework users are direct and indirect participants in the adaptive reuse project. Participants at each phase may use the framework as a reference or as a blue print. Therefore, "participant" and "user" are inclusive concepts that comports with stakeholder categories commonly noted in the literature (Aapaoja and Haapasalo, 2014; Adams et al., 2017; Debacker and Manshoven, 2016; Hobbs and Adams, 2017; Kubbinga et al., 2017). They include those participants with a financial stake in the project's costs and revenues as well as participants who may or may not contribute to the revenue of the property in its Use and Operate phase. Table 2 couples the description of each phase with its participants. The list of participants provided in Table 2 is descriptive and generalized, not exhaustive because each project's stakeholder identification process is unique.

4.3. Circular economy strategies for adaptive reuse of cultural heritage buildings to reduce environmental impacts

This section presents the central result of this research study, the framework of CE strategies for adaptive reuse of cultural heritage buildings to reduce environmental impacts. The framework is intentionally deep and narrow in scope with the aim of addressing the

Table 1
Relevant Literature Regarding CE Strategies for Adaptive Reuse of Cultural Heritage Buildings.

Citation Data	Main contribution to the literature	Main relevant results	Methods used	Limitations relevant to the present study	Strategy Source?
Papers					
Conejos, Sheila. "Designing for future building adaptive reuse." (2013).	This important publication provides criteria for future adaptive reuses of new buildings from the point-of-view of design and develops the rating tool adaptSTAR. Describes Sustainability Assessment Methods and highlights that the majority of these are for new buildings.	The paper highlights two main goals of a CE approach, long life and the ecological footprint.	Survey, Literature review, case studies, Empirical analysis	Conejos highlights environmental impacts that are linked to the design phase, e.g., design for "ecological sustainability objectives and helps minimize ongoing habitat disturbance." However, it is not the task of the paper to provide strategies at every stage of the lifecycle as the proposal does.	Yes
Heidrich, Oliver, et al. "A critical review of the developments in building adaptability." *International Journal of Building Pathology and Adaptation* 35.4 (2017): 284–303.	Conveys the "state-of-the-art". The paper is not about circularity, but distils the theory and models behind building adaptability to the layers social, space, stuff, plan, services, skin, structure, site, surroundings.	It clarifies the dimensions and strategies of adaptability and notes the most cited adaptability characteristics.	Literature review	The paper highlighted the interactions between building layers. The adaptability strategies for layers were useful in developing the framework.	Yes
Ghisellini, Patrizia, Maddalena Ripa, and Sergio Ulgiati. "Exploring environmental and economic costs and benefits of a circular economy approach to the construction and demolition sector. A literature review." *Journal of Cleaner Production* 178 (2018): 618–643.	This in depth discussion of C&D wastes applies the CE framework to C&D wastes using the 3 Rs, Reduce, Reuse, and Recycle. The article also reviews methods used in the literature to determine environmental impacts and environmental and economic costs.	This article applies a product life cycle approach to waste, an important measurement of the CE approach. The authors confirm that "refurbishing seems to provide lower environmental impacts than demolition and new construction", but is "less competitive in economic terms than new construction" (Ghisellini et al., 2017).	Literature Review	Although waste, at the end of life phase is an important measure of environmental impact relevant to CE for example carbon and energy. Also, the 3Rs, is a narrow interpretation of CE principles; whereas the R0 to R9 strategies described by Potting et al. as adapted herein is a more structured, detailed, and useful approach for understanding CE in construction in general, and adaptive reuse in particular.	Yes
Adams, Katherine, et al. "Circular Economy in Construction: Current Awareness, Challenges and Enablers." (2017).	The authors survey industry participants to gauge their awareness, challenges and enablers regarding CE strategies.	In addition to their main research results, which establish a significant gap in knowledge in the field, the authors published a concise table of CE aspects across a building's life cycle stages.	Survey and analysis of the literature.	The table of circular economy that Adams, et al. derives from the literature is the closest example to the current proposal identified. However, it does not apply or interpret the strategies using the R0-R9 concept.	Yes.
Pomponi, Francesco, and Alice Moncaster. "Circular Economy for the Built Environment: A Research Framework." *Journal of cleaner production* 143 (2017): 710–18.	This article proposes a framework for CE research for the built environment. However, it does not discern the conditions and strategies for CE in the construction sector in a framework.	The framework assigns manufactured components to the micro level, buildings to the meso level and cities to the macro level.	Literature review	In contrast, the present study agrees with (Ghisellini et al., 2016) that the micro level is products and in this case buildings are the micro level in a transition to a sustainable built environment. In contrast, the current study places the strategies in a CE framework.	No
Pomponi, Francesco and Moncaster, Alice. "Embodied Carbon Mitigation and Reduction in the Built Environment–What Does the Evidence Say?" *Journal of Environmental Management* 181 (2016): 687–700.	The authors discuss seventeen diverse embodied CO₂ mitigation strategies that they gleaned from the literature.	Their study showed that a range of strategies is needed, as no one strategy was effective in embodied CO₂ reduction.	Literature review and meta-analysis	The article presents a deep analysis of embodied CO_2 across all life cycles. However, it is not combined with other potential environmental impacts, focusing only on low-carbon impacts.	Yes
Aytac, D. O., T. V. Arslan, and S. Durak. "Adaptive Reuse as a Strategy toward Urban Resilience." *European Journal of Sustainable Development* 5.4 (2016): 523–32.	Proposes design considerations for the adaptive reuse potential of existing buildings incorporating the theories of resilience from ecology and building layers from architecture.	The main relevant results are mapping the layers to the adaptSTAR criteria. The theoretical development proposed for the "resilient adaptive reuse strategies" is interesting and fits well with CE concepts.	Theoretical study	As the article notes, detailed criteria are needed for the building layers "based on building life and product life cycles". The current proposal fulfills this need to some extent as it fits detailed strategies into a product life cycle frame.	No

(continued on next page)

Table 1 (*continued*)

Citation Data	Main contribution to the literature	Main relevant results	Methods used	Limitations relevant to the present study	Strategy Source?
Munarim, Ulisses, and Enedir Ghisi. "Environmental Feasibility of Heritage Buildings Rehabilitation." Renewable and Sustainable Energy Reviews 58 (2016): 235–49.	This study discusses environmental impacts avoided by reuse of existing buildings using the lens of life cycle analyses (LCA). The foci are mainly energy consumption and embodied CO2.	The paper confirms the environmental benefits of adaptive reuse of buildings. The authors find that LCA is a reliable indicator of environmental impact.	Literature Review	Discrete strategies are not the paper's focus, instead it reviews existing LCA methodologies and regulations. The extended building life cycle concept described is different from the framework's life cycle approach. Munarim et al.'s approach is not fully circular, although it targets the end-of-life as the phase for recycling, reuse, and rehabilitation as a new phase. However, the authors share the same research motivations and observations about the field as the present study.	No
Berthold, Étienne, Juste Rajaonson, and Georges A Tanguay. "Using Sustainability Indicators for Urban Heritage Management: A Review of 25 Case Studies." (2014).	Identifies the most frequently used indicators including CO2 emissions, recycling materials, reducing resource and materials consumption, environmental and ecological awareness, implement low pollution, energy efficient infrastructure, and environmental quality of area.	Culls the longer list of most frequently used indicators to 20 key indicators of sustainable urban heritage conservation, such as "Viability of recycling existing materials"	Reviewed 25 case studies.	This review does not apply a circularity perspective or identify strategies to carry out the indicators.	Yes
Grey Literature					
Frey, Patrice, et al. "The greenest building: Quantifying the environmental value of building reuse." Preservation Green Lab, National Trust for Historic Preservation (2011).	This is the most complete report to date on the topic. It is cited frequently in the literature because it sets out a clear rationale for environmental benefits of building reuse.	Defines the phase of a buildings life cycle with the highest environmental impacts. Quantifies the environmental impacts of renovation as a percentage of new construction.	Compares Demolish vs Reuse case studies using Life Cycle Assessment	Although the analysis is not specifically circular it provides an overview of the life cycle stages and identifies the operating phase as the most important. This is particularly important as the environmental impacts of the operating phase; beyond energy efficiency is often neglected in adaptive reuse studies. Therefore, this paper leads to the use and operate phase should being emphasized here. The focus of this article is empirical analysis of potential environmental benefits such as CO_2 savings from reuse projects not *how* to achieve the benefits.	No
Kubbinga, Ben, et al. A Future Proof Built Environment. Netherlands: Circle Economy and ABN AMRO, 2017.	The Dutch bank ABN AMRO and social enterprise Circle Economy review the implications of the CE approach for the construction industry with a Dutch perspective emphasizing the construction of the CIRCL ABN AMRO building in particular.	Excellent overview of the issue that identifies new value chains in adaptive reuse.	Business report	The framework incorporates the new value chain models as strategies.	Yes
Debacker, Wim, and Saskia Manshoven. "D1 Synthesis of the State-of-the-Art." Key barriers and opportunities for Materials Passports and Reversible Design in the current system. 2016	The report poses the important question, "Why are Design/Build for Change and Circular Economy not yet (fully) integrated in the current building practice and related policy?" The research determines that circularity in the building sector requires strong interactions between all main phases. Also, the authors observe that the industry is conservative, slow to change, and circular solutions are considered too expensive.	Based on their observations, the authors characterize the building life cycle phases as "design, build, use and repurpose" and describes the sub-phases of each phase. Provides an in-depth description of actors and their roles at each phase.	European Union Project report for the Buildings as Material Banks Project	This report provides ample evidence that the proposed framework would be useful to multiple actors in the sector. The proposed framework agrees with this report that the design phase is critical. In contrast, the proposed framework includes the phase of raw material extraction.	Yes

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Table 1 (*continued*)

| Citation Data	Main contribution to the literature	Main relevant results	Methods used	Limitations relevant to the present study	Strategy Source?
MacArthur, E., K. Zumwinkel, and M. R. Stuchtey. "Growth within: a circular economy vision for a competitive Europe." Ellen MacArthur Foundation (2015).	This report explores future development scenarios for major industries including the building sector in Europe. Each scenario's output is measured in total consumer output (TCO). The report promotes the RESOLVE framework (Regenerate, Share, Optimize, Loop, Virtualise, Exchange).	According to this report, a circular scenario for the building sector might reduce TCO by 50%. Articulates a circular city/built environment vision.	Scenario analysis with economic modeling	The present work is narrower in scope, does not use benefit calculations, and offers readers many more practical strategies.	Yes
Books					
Description of book					
Wilkinson, Sara J., Hilde Remøy, and Craig Langston. Sustainable building adaptation: innovations in decision-making. John Wiley & Sons, 2014.	This book concentrates on commercial buildings adaptive reuse case studies. It clearly explains and links between theories for building adaptive reuse and sustainability. It is essential reading for architects and design experts interested in the topic.				Yes
Carroon, J. (2010). *Sustainable preservation: Greening existing buildings*. John Wiley & Sons.	This book covers all theoretical and technical aspects of the topic including energy, resource optimization, and waste reduction. It is an essential resource for a more technical audience.				Yes
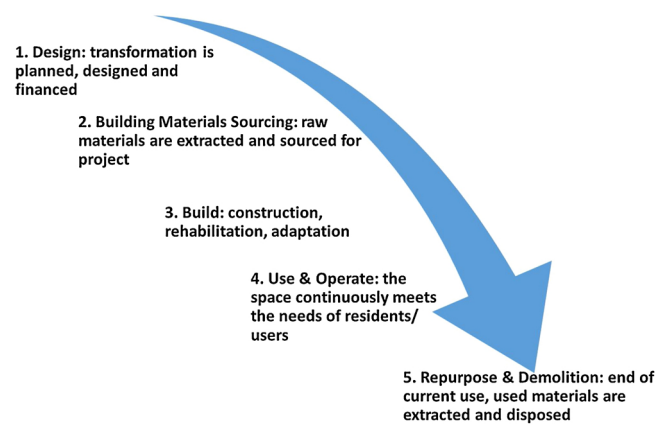
Fig. 4. Building Life Cycle Phases as a Linear Supply Chain.

research needs discussed in Section 3.1. It provides a heretofore-missing tool for stakeholders at all phases of an adaptive reuse building's lifecycle. The framework builds on the schema devised by Potting et al. summarized in Fig. 5. A higher level of circularity implies that materials remain in the product value chain longer, are more intensively used, and, in the case of refusing materials, never enter the value chain at all. The main goal of circularity is to reduce new extraction of materials from the environment. Strategies that achieve a higher level of circularity should receive a higher priority in project planning. This means that, strategies in the green zone "Smart building use and manufacture" impart more circularity than those strategies in the orange zone, "Useful application of materials". This is relevant because most practical circularity approaches in the construction industry are for recycling and recovery.

The analysis applies the schema differently than the authors originally devised as follows.

- Although, Potting et al. mention circularity for the building sector and the circular city concept, they identify only R1 to R9 as possible strategies. Because the current framework inspires reusing existing buildings and includes the Design phase, it explores R0 "Refusing materials" as well. R0 strategies, in this work, are powerful engines of circularity and are in fact its overarching achievements. R0 strategies represent transformative progress towards circularity, likewise sustainability.
- The current work broadens the scope of the green zone "Smart building use and manufacture", R0 to R3, to emphasize opportunities for direct environmental benefits/reducing environmental impacts such as eliminating fossil fuels, addressing climate change, recovering water and energy, and increasing green space and habitat. Further, the green zone now includes using materials from biomass rather than fossil fuel intensive materials for building materials. This is a high-level circularity strategy because biomass may be returned to natural resource stocks over time. In addition, the sustainability focus of the framework and the inclusive definition of participants leads to including strategies aimed at human interaction with the project in the blue zone "Extend lifespan of building and its parts", which are R3 to R7. For example the strategies: enhancing public access to the site; reviving traditional construction techniques; improving access to low-carbon mobility options; and realizing cultural heritage benefits do not necessarily concern the construction, instead the project's influence on the people who use it. These influences make the project valuable to all participants, thereby enhancing its lifespan. These changes in scope are due to the current application, existing buildings, which are fundamentally different from Potting et al.'s case study products (plastic packaging and large household appliances). This research demonstrates that Potting et al.'s, circularity strategies within the production chain are

Table 2

Building Life Cycle Phase Participants and Framework Users.

Phases	Participants/Framework Users (in no particular order)
Design: transformation is planned, designed and financed	Project lead team-responsible for project, may include the owners and combination of the following participants. Owners Project financers/Bankers Head Architects Historic Preservation Architects Local cultural heritage experts Architectural conservation experts Experts in traditional building techniques (wood framing, stone and lime mortars, plasterwork, etc.) Contractors and Subcontractors Local & regional government planning officials Local & regional government regulators Residents, tenants, and users (if accessible to the general public, people who use the space for recreation, etc. e.g., public park) Neighborhood & regional residents
Building Materials Sourcing: raw materials are extracted and sourced for project	Architects Contractors Procurement experts Regional materials suppliers (foresters, saw mills, quarries, thatch materials dealers, recovered construction materials dealers) Local manufacturers of components, glass, doors, windows, tiles, carpets, metalwork, etc. Companies for waste and materials recovery including collection, sorting, and selling and reselling
Build: construction, rehabilitation, adaptation	Regional/Traditional Artisans (masons, carpenters, joiners, millwrights, weavers, plasterwork, plaster decorations for facades, metalwork, shinglers, etc.) Architects Contractors and Subcontractors Suppliers Owners Local cultural heritage experts Architectural conservation experts
Use & Operate: the space continuously meets the needs of residents/users	Residents Commercial renters Owners Neighbors Users Visitors (for example museum, library, exhibit, aquarium, etc.) Utility operators that provide energy, water, and waste disposal, for example
Repurpose & Demolition: end of current use, used materials are extracted and disposed	Project lead team- responsible for project, may include the owners and combination of the following participants. Owners Architects Companies for waste and materials recovery including collection, sorting, selling and reselling Energy firms Landfills Local & regional government planning officials Local & regional government regulators

useful and flexible enough to apply in a broad range of sectors and products.

Fig. 6 illustrates the components together in the Circular Economy Strategies for Adaptive Reuse of Cultural Heritage Buildings to Reduce Environmental Benefits. Each of the individual strategies creates feedback loops between individual phases of the building life cycle. Closing material loops is a common technique for circularizing a production process or product supply chain. In this case, as explained above, circularization starts with material and extends to people. The circle in Fig. 6 is the building life cycle envisioned as a circular product supply chain (the solid blue boxes). Each phase in the circle is connected continuously. Individual strategies are color-coded according to the ascending principles of circularity proposed by Potting et al., adapted herein. For example, "Plan for long term climate change by choosing flexible heating and cooling" is an action undertaken in the Design phase and color-coded green because it addresses climate change. Similarly, the strategy "Design for energy efficiency including passive methods" is green because it exemplifies R2 "Cutting raw materials". Finally, orange zone strategies, R8 and R9, capture "Useful application of materials" for recycling and recovery for process inputs (e.g., recycled plastic bottles) or heat energy (incineration). In total, the

framework lists forty-seven strategies organized by building life cycle phase and circularity zone indicating the degree to which the strategy implements circular economy goals.

4.4. Implementing the framework

The envisioned implementation of the framework has two central goals. First, the framework allows participants in a cultural heritage adaptive reuse project to gauge the level of circularity that a project achieves. The participants may evaluate if their current plans cluster in "Useful Application of Materials" or achieve a higher level of circularity, such as "Smart building use and manufacture". Second, following this assessment, projects may choose to include additional strategies from the framework to raise the level of circularity. In this way, the framework provides straightforward guidance to both technical and non-technical participants. This guidance is necessary because, as the literature review concluded that knowledge about *how* to implement CE is lacking (De Jesus and Mendonça, 2018; Mahpour, 2018). This framework provides a methodology for assessing a project's level of circularity *and* provides guidance to realize CE for cultural heritage adaptive reuse projects.

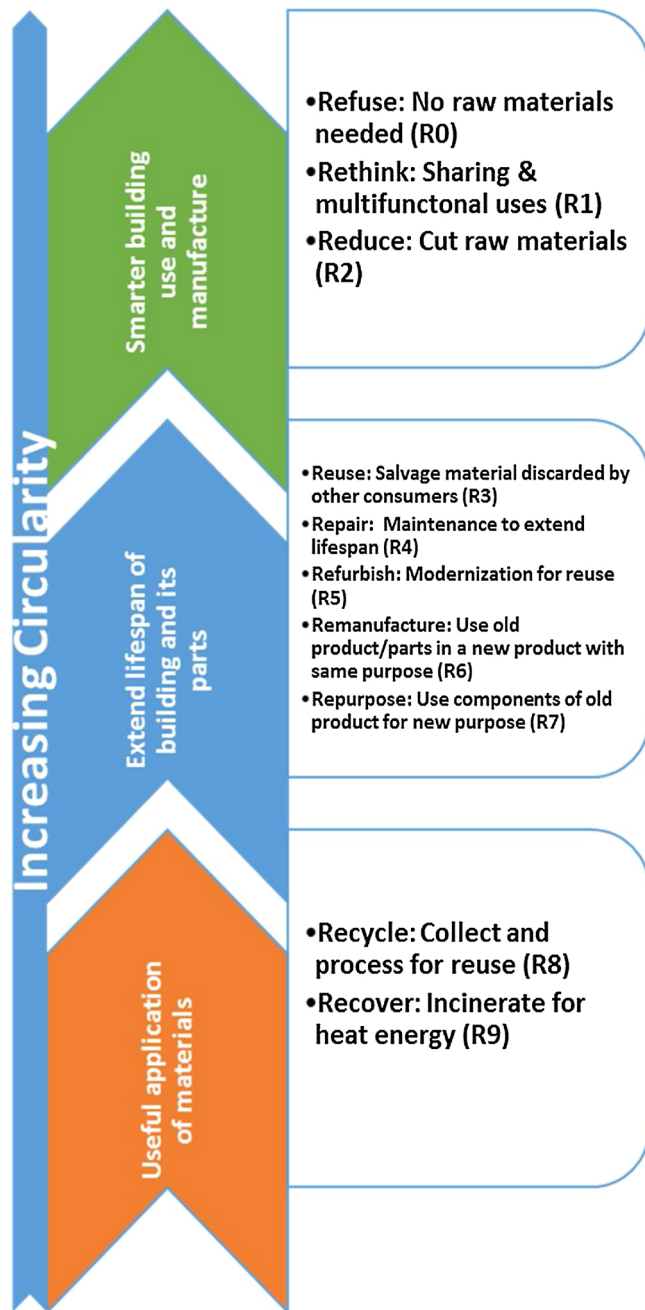Flexibility is an important feature of the framework. Participants

Fig. 5. Ascending circularity strategies indicating order of priority.

- **Refuse:** No raw materials needed (R0)
- **Rethink:** Sharing & multifunctonal uses (R1)
- **Reduce:** Cut raw materials (R2)

- **Reuse:** Salvage material discarded by other consumers (R3)
- **Repair:** Maintenance to extend lifespan (R4)
- **Refurbish:** Modernization for reuse (R5)
- **Remanufacture:** Use old product/parts in a new product with same purpose (R6)
- **Repurpose:** Use components of old product for new purpose (R7)

- **Recycle:** Collect and process for reuse (R8)
- **Recover:** Incinerate for heat energy (R9)

may use the framework at any phase of the building life cycle education, assessment, and improvement. For example, a project team that is already at the Use & Operate phase can start with the strategies listed, noting how these connect with other phases. In addition, the team can use Table 2 to identify relevant participants at other phases. For example, the strategy "Provide facilities for easy collection of recyclable materials and biomass for compost" of the Use & Operate phase links to four other phases and involves residents, the municipality, and materials recovery firms. Fig. 7 depicts three examples with arrows connecting a strategy to several phases. The Annex I provides a tabular list of strategies with corresponding links to each phase.

5. Discussion and conclusions

This research establishes a new and comprehensive framework for circularity strategies for existing buildings, addressing cultural heritage

preservation and environmental impacts. The findings derive from a structured review and synthesis of the relevant literature. The framework's design is straightforward and easily understood. It is intended as a practical tool for project teams made up of participants and non-participants at every stage of a building's life cycle. Project teams should use it as: 1) a planning and evaluation tool at the start of project development; 2) an exploratory scoping exercise in combination with other participatory methods; and 3) for post project review of circularity as well. Non-participants may use the framework for education and policy development. For example, it can inform public procurement experts about the level of circularity that a building project achieves.

The next steps of this research are hypothetical and practical. Hypothetically, the framework's scope may be expanded to additional topics that are needed to realize circularity, such as circular environmental impact indicators. The current use of the R0-R9 scheme suits environmental impacts well, but may not fit other topics (finance, governance, etc.). A new ranking scheme to express relative levels of circularity for additional topics is necessary in future. Practical research applies the framework in actual projects with participatory planning. The research results will evolve and improve through use. Incorporating feedback from users is critical because implementing circularity is fundamentally a social process that will need to go beyond niche initiatives to social acceptance at the macro level.

The main challenges of this study were to triage a large body of literature, distill important strategies, and present them in a comprehensive way intended for a diverse audience. The tactic taken to overcome these challenges was to deliberately narrow the scope. The trade-offs for this decision are limitations of the study. The results are comprehensive, however are not exhaustive. Moreover, each strategy has a history of experimentation and context not discussed in this paper. It is a deliberate choice to present the information in an article format and graphics instead of a book in order to best disseminate solutions for mitigating environmental impacts including curtailing carbon emissions to decision makers. The article format presumes that most readers have adequate technical knowledge (architects, engineers, planners) to apply the strategies in practice, whilst meeting the needs of a diverse audience.

Another challenge of the research is that all cultural heritage buildings and their adaptive reuses are unique, place-based and community-based, meaning that a universal solution is impossible. This challenge may be obvious; nevertheless, it is significant. A consequence is that the strategies serve conflicting goals. For example, increasing green space conflicts with maximizing space utilization (increasing density). It will be up to the users to carefully consider conflicts and tradeoffs resulting from the circularity strategies.

In conclusion, the goal of circular economy is macro-level transformation to a sustainable economy. This goal cannot be reached without the micro level transformations supported by this research. It is not enough to focus on closing material loops to create new products from today's waste streams without care for the overall scale of resources used. Reducing the throughput and total amount of resources used in the construction industry is the ultimate goal of the research; therefore, the emphasis on promoting higher-level strategies.

Declaration of Competing Interest

None.
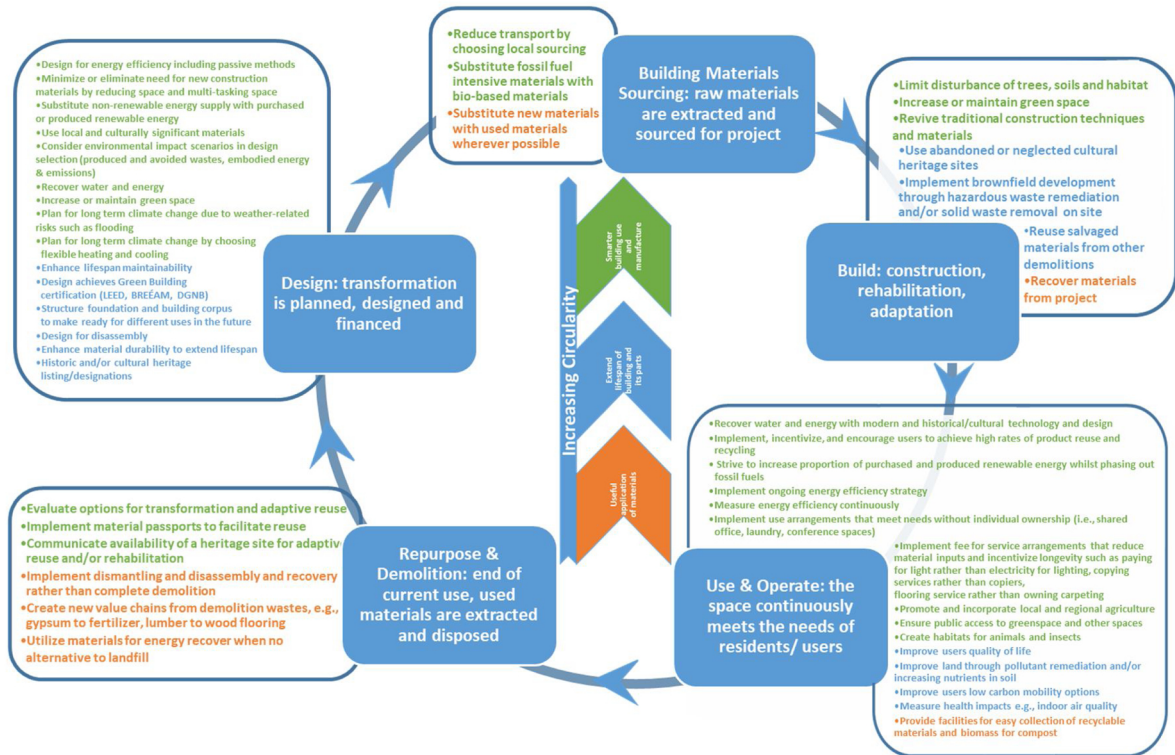
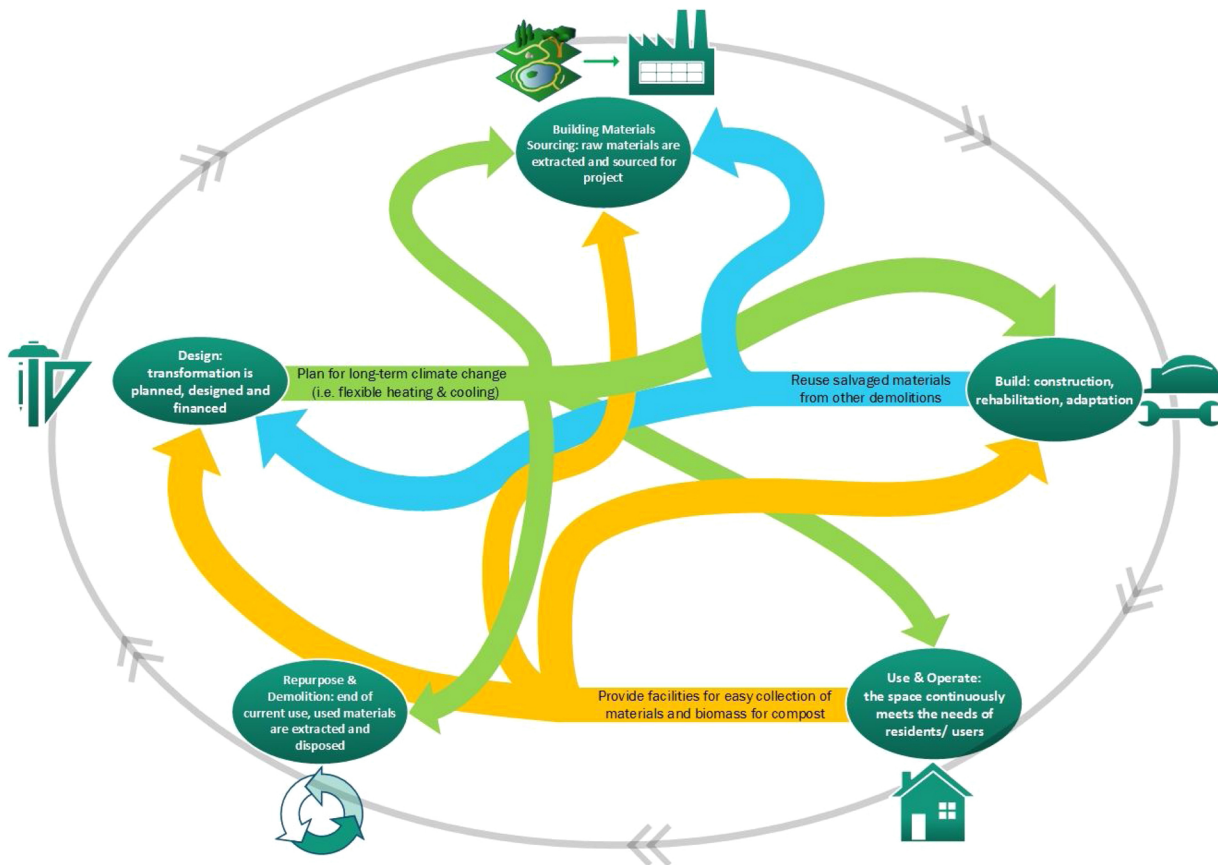# Circular Economy Strategies for Adaptive Reuse of Cultural Heritage Buildings to Reduce Environmental Impacts

Design: transformation is planned, designed and financed
- Design for energy efficiency including passive methods
- Minimize or eliminate need for new construction materials by reducing space and multi-tasking space
- Substitute non-renewable energy supply with purchased or produced renewable energy
- Use local and culturally significant materials
- Consider environmental impact scenarios in design selection (produced and avoided wastes, embodied energy & emissions)
- Recover water and energy
- Increase or maintain green space
- Plan for long term climate change due to weather-related risks such as flooding
- Plan for long term climate change by choosing flexible heating and cooling
- Enhance lifespan maintainability
- Design achieves Green Building certification (LEED, BREEAM, DGNB)
- Structure foundation and building corpus to make ready for different uses in the future
- Design for disassembly
- Enhance material durability to extend lifespan
- Historic and/or cultural heritage listing/designations

Building Materials Sourcing: raw materials are extracted and sourced for project
- Reduce transport by choosing local sourcing
- Substitute fossil fuel intensive materials with bio-based materials
- Substitute new materials with used materials wherever possible

Build: construction, rehabilitation, adaptation
- Limit disturbance of trees, soils and habitat
- Increase or maintain green space
- Revive traditional construction techniques and materials
- Use abandoned or neglected cultural heritage sites
- Implement brownfield development through hazardous waste remediation and/or solid waste removal on site
- Reuse salvaged materials from other demolitions
- Recover materials from project

Increasing Circularity
- Smarter building use and manufacture
- Extend lifespan of building and its parts
- Useful application of materials

Repurpose & Demolition: end of current use, used materials are extracted and disposed
- Evaluate options for transformation and adaptive reuse
- Implement material passports to facilitate reuse
- Communicate availability of a heritage site for adaptive reuse and/or rehabilitation
- Implement dismantling and disassembly and recovery rather than complete demolition
- Create new value chains from demolition wastes, e.g., gypsum to fertilizer, lumber to wood flooring
- Utilize materials for energy recover when no alternative to landfill

Use & Operate: the space continuously meets the needs of residents/ users
- Recover water and energy with modern and historical/cultural technology and design
- Implement, incentivize, and encourage users to achieve high rates of product reuse and recycling
- Strive to increase proportion of purchased and produced renewable energy whilst phasing out fossil fuels
- Implement ongoing energy efficiency strategy
- Measure energy efficiency continuously
- Implement use arrangements that meet needs without individual ownership (i.e., shared office, laundry, conference spaces)
- Implement fee for service arrangements that reduce material inputs and incentivize longevity such as paying for light rather than electricity for lighting, copying services rather than copiers, flooring service rather than owning carpeting
- Promote and incorporate local and regional agriculture
- Ensure public access to greenspace and other spaces
- Create habitats for animals and insects
- Improve users quality of life
- Improve land through pollutant remediation and/or increasing nutrients in soil
- Improve users low carbon mobility options
- Measure health impacts e.g., indoor air quality
- Provide facilities for easy collection of recyclable materials and biomass for compost

Fig. 6. Circular Economy Strategies for Adaptive Reuse of Cultural Heritage Buildings to Reduce Environmental Impacts.

Fig. 7. Three strategies connecting building life-cycle phases highlighted.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.resconrec.2019. 104507.

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ARTICLES FOR FACULTY MEMBERS

CULTURAL HERITAGE

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Article

Community Participation in the Importance of Living Heritage Conservation and Its Relationships with the Community-Based Education Model towards Creating a Sustainable Community in Melaka UNESCO World Heritage Site

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Abstract: Living heritage runs the risk of being lost forever, or frozen as a practice of the past, if not promoted in the community. The preservation of this history, its transmission to following generations, and its ability to transform and adapt to any circumstance, are all made possible by strengthening living heritage. Investigating the function of living heritage in advancing education for sustainable development has been deemed a crucial goal by quality education as Sustainable Development Goal number 4 (SDG 4). The aim of this article is to gather information on living heritage conservation toward creating a sustainability community by using the community-based education model on the communities' attitudes, cultural knowledge, and awareness of the importance of living heritage, and their participation level towards living heritage conservation in Melaka UNESCO World Heritage Site. This study uses the quantitative method of online questionnaire survey technique to collect data. There are 392 respondents from the multicultural community of Melaka World Heritage Site, who randomly responded. Based on the mean comparison in gender, age level, and race, there is a positive significant relationship between the importance of living heritage and the local community's participation level. The increasing of the participation level to ACTIVE would lead to a higher altitude, cultural knowledge, and awareness of the importance of living heritage in the local community.

Keywords: intangible cultural heritage; public awareness; quality education; sustainable development

1. Introduction

Preservation is defined as an effort to maintain cultural materials in both tangible and intangible forms, including oral tradition, music, and cultural activities. Tangible cultural heritage includes elements such as buildings, landscapes, structures, locations, and communities [1,2].

The most effective strategy for promoting cultural diversity is intangible cultural heritage (ICH), which demonstrates the diversity of living human heritage. ICH's "self-identification as an imperative part of its creator's and carriers' cultural identity" determines its main "constitutive components". The ICH fixed recreation in feedback to the historical and social transformation of the communities and groups in question by connecting with their cultural identity, authenticity, and unbreakable connection to human rights [3]. The depth of meaning, attachment, and variety of place experiences are all impacted by place identity, which is linked to how people define and perceive their surroundings. The traditional settings of the city center are being altered by new developments, as shown by this evidence [4], which also shows how place definitions and extensions are being changed.

Influential 20th-century thinker, R. Williams, stated in 1960 that culture could not be compressed into tangible elements since it lives and changes constantly. He was able to capture the historical legacy of the fundamental components defining the ongoing evolution and development of human communities. Cultural heritage as people's way of life encompasses all supplementary elements that a given community views as mandatory parts of its inherent identity, as well as its uniqueness and distinctiveness in relation to all other human groups, demonstrating the very essence of its distinctive trait.

The United Nations' Organizations Agenda for Sustainable Development (Agenda 2030) supports the aforementioned claim and lists "safeguarding the world's cultural and natural legacy" as one of its goals in item 11.4 of the document [5]. The Sustainable Development Goals (SDG) and the fundamental foundations of the Roadmap on Education for Sustainable Development 2030 are both emphasized once more [6,7].

Amid a time of increasing complexity, change, and a lack of predictability, to transform how information and learning may benefit humanity, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) launched the Future of Education initiative in September 2019. UNESCO focuses on challenges that will have an impact on the well-being and education of future generations, such as climate change, growing imbalances, artificial intelligence, educational outcomes, and opportunities. UNESCO is currently inviting people from all across the world to share their visions for the future of knowledge.

The Future Education Initiative's goal is to comprehend how education might shape humanity's and the planet's futures in 2050, and beyond [8]. The initiative is generating a global debate on how knowledge, teaching, and learning must change to solve today's and tomorrow's issues, involving youth, educators, civil society, governments, businesses, and other stakeholders. The idea of the future is used in this effort to highlight the great range of ways people all around the world know, and therefore are.

In the Fourth Industrial Revolution, artificial intelligence, and in a robotics-driven modern world, we must promote flexibility and adaptation. As a result, education needs to be entirely rethought. Instead of memorizing facts and figures, people should "learn how to study" and find solutions to problems [9]. They should be inspired to investigate independent learning as well. Changes are needed on every level. To prepare individuals for the future, we must develop an education system that is both backward-looking and forward-looking.

Previous researchers worked together to develop specific guidelines [10] and mapped learning and teaching practices and policies on living heritage, within the context of education for sustainable development [11–14], in order to organize learning and teaching with a living heritage for a sustainable future.

Participation in local communities is one of the crucial aspects for the management of WHS. The Melaka city area has been a UNESCO WHS for 13 years, so what is the contribution of community and government doing to safeguarding their intangible cultural heritage? The importance of community participation throughout decision-making, implementation, and enforcement, has been widely acknowledged [15,16]. However, Ong (2017) research recognized that this aspect is the most neglected by the authorities concerned in Melaka WHS. This situation affects the attitude of the local community to conserve their heritage. One of the critical success factors for sustainable conservation is the awareness and appreciation of the heritage value of the resources by stakeholders, particularly the local community. An informed society or community will make wise decisions about protecting and preserving resources that define the very essence of their culture and society [17].

The success of heritage site conservation depends on two factors, which are the stakeholders' awareness, participation, and appreciation of heritage values and their economic potential [17,18], and the public education programs designed for various stakeholders [17].

Educational opportunities and programs are scarce in Melaka WHS regarding the participation process in conserving the living heritage site in Melaka WHS [19]. Rahimah (2017) states that they have had to deal with difficulties, including the modernization and development taking place in Melaka State, which is viewed as increasing the vulnerability

of their existence or survival, as well as concerns about authenticity. Additioanlly, there are difficulties concerning the participation and involvement of members of the respective community in cultural heritage conservation. The younger generation are slowly losing their ethnic heritage and identity under the onslaught of modernization and globalization in favor of adopting more mod values [20]. The communities would lose their ethnic identity and cultural values because of these external influences, as the modern way of life dominates traditional knowledge.

This article advocates studying the community's attitudes, cultural knowledge, and awareness of living heritage site conservation in Melaka UNESCO World Heritage Site (WHS), as the third step in the community-based education (CBE) model of information gathering. By enhancing, protecting, and passing down the living heritage that ensures its continuity to future generations, this study aimed to create a sustainable community.

2. Literature Review

2.1. Intangible Cultural Heritage

The 2003 Convention on the Safeguarding of Intangible Cultural Heritage [21] lists five broad "domains" in which intangible cultural heritage (ICH) emerges. These five criteria will be used to assess a participant's competency and comprehension in light of daily standards, from both their own and another culture. Intangible cultural heritage is described in Article 2 of the UNESCO Convention as representations, expressions, knowledge, skills, and the accompanying tools, artifacts, and cultural sites. The communities viewed themselves as representatives of their cultural heritage. If it is not preserved in the community, intangible cultural heritage faces the risk of becoming extinct or a legacy of the past. Therefore, it is essential to safeguard intangible cultural heritage, as it keeps it alive, transmits it to future generations, and offers it the adaptability to face any situation. Safeguarding ICH for future development is essential for the economy, society, and environment. It also fosters peace and security. The greatest technique to assist local populations and the community is to transmit ICH traditions, or living heritage, through excellent instruction.

The 2003 UNESCO Convention for the Protection of Intangible Cultural Heritage or Living Heritage proposes five broad domains, namely [21]:

(1) Oral traditions and expressions encompass a wide variety of speech forms, including proverbs, riddles, fables, nursery rhymes, stories, myths, epic songs and poems, charms, prayers, chants, songs, dramatic performances, and more. Through it, information, cultural and social values, and collective memory, are all transmitted. It is also essential for preserving tradition.

(2) The performing arts include chanting, pantomime, vocal and instrumental music, dancing, and theatre. It contains several cultural manifestations that showcase human creativity.

(3) Social practices, rituals, and festivals are commonplace routines that shape community and group life and are essential to all participants. It is crucial because it represents the group or society's identity and is strongly tied to significant occasions, whether they take place in public or private settings.

(4) Knowledge and practices about nature and the universe comprise the community's developed knowledge, abilities, behaviors, and representations that interact with the environment. Language, oral traditions, sentimental ties to a place, memories, spirituality, and worldview are examples of how this method of understanding the universe is expressed. It also has a significant impact on attitudes and beliefs, as well as numerous social traditions and cultural activities.

(5) Traditional craftsmanship is expressed most succinctly in intangible cultural heritage. It emphasizes the skills and knowledge needed for carpentry rather than the craft of the end product. It must therefore inspire artisans to continue producing their work and passing on their skills to others, particularly those within their communities.

2.2. Community-Based Education (CBE) Model

CBE's goal is to empower adults and youth in the community by promoting involvement and education, as well as by identifying and resolving [22] conservation issues relevant to the community's living legacy, in the context of local social and economic elements. In other words, community-based behavior is inspired by education. One of the best results achieved by CBE is the building of collaboration ability to satisfy their common goals in community development plans [23]. Instead of only the definition of "education based in the community", activities are concentrated on four key characteristics: community-based, collaborative, information-based, and action-oriented.

The effectiveness of the initiative is influenced by the community's background, including member education, participation, place-based, youth and community development in a diversity of productive activities [24]. Five phases are suggested, based on the model in Figure 1, for capacity building using community-based education concepts. The three-step informed group activities for sustainable CBE management and the planning process for LH conservation, which is where the detailed process used in this research study is located in this paper. The stakeholders must complete the tasks to assess strengths, assess needs, gather data, and plan actions before effective education may be achieved. As a result, this study will primarily focus on the information-gathering phase.
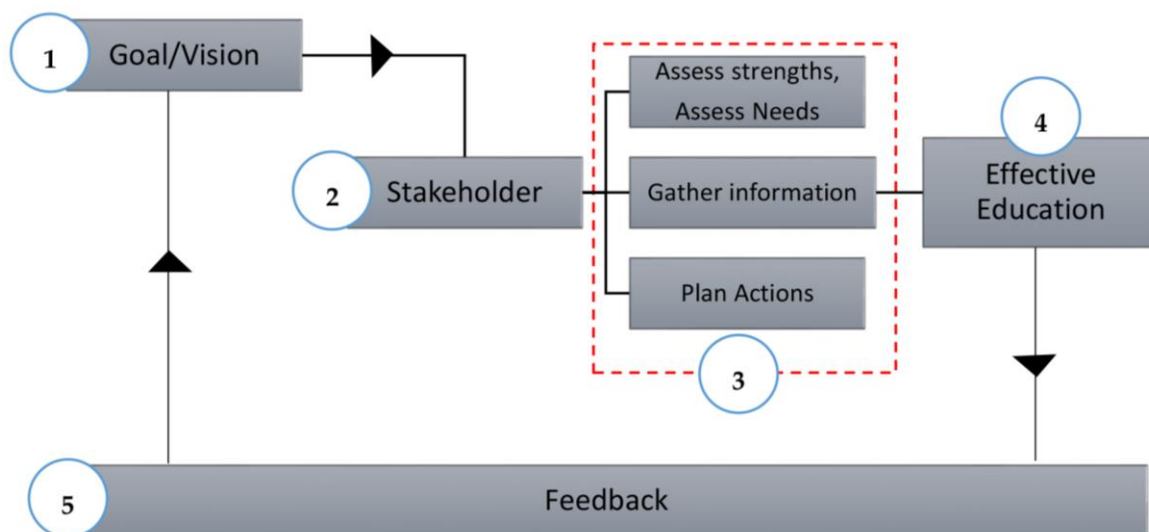
Figure 1. Building capacity: applying the principles of community-based education for living heritage conservation site, readapted with permission from Ref. [25].

Informed Group Activities

There are three divisions in informed group activities, which are: (1) assessing the community's strengths and needs; (2) gathering information; and (3) planning actions. This section was essential to identify the local communities' perception of their ICH value and to create effective education from analysis results. Therefore, this paper will be focused only on the gathering information part on the communities' attitudes, cultural knowledge, and awareness of the importance of living heritage, and their participation level towards living heritage conservation in Melaka UNESCO World Heritage Site.

i.   Assess the Community's Strengths and Needs

In any community capacity-building approach, community strengths and needs are essential factors if stimulated by a goal [26]. This study investigates the current status of the strength of the community in living heritage conservation areas on heritage resources such as history, visual and performing arts, heritage buildings, landscapes, and unique lifestyles, values, traditions, and events.

Understanding the needs of the entire community is the foundation of any approach to building community capacity. Individual needs will differ from person to person in terms of complexity and strength. Certain requirements may be more broadly shared within the community when it comes to gaining access to services and/or resources [27]. A community's changing political, social, and economic conditions will affect collective demands to varying degrees [28–30]. We can decide how the community can assist a particular person to handle their challenges more successfully by concentrating on that person's needs [31]. Authorities can better understand the community by interacting with community members directly about their needs, in order to enhance decision-making for sustainable development.

ii.   Gather Information on Community's Attitude, Cultural Knowledge, and Awareness toward Living Heritage Conservation

Understanding attitudes, cultural knowledge, and awareness of LH conservation are necessary to determine the amount of knowledge and awareness of the local community's own ICH in everyday practice. When evaluating stakeholders, the attitudes, cultural awareness, and a general understanding of the living heritage area, are essential factors in determining the sustainability of a heritage site [32–34]. This study will first ascertain the community's attitude toward, the amount of knowledge about, and an awareness of ICH. The wealth of knowledge and skills passed down from one generation to the next was essential for ICH conservation. The importance of knowledge's social and economic value is significant to both minority groups and groups in the majority society. Processes, words, knowledge, skills, connected artifacts, and cultural spaces are examples of intangible cultural heritage that individuals recognize as a part of their own. Being passed down through the generations and continually renewed, the spread gives humans a sense of identity and continuity. Examples of factors that have a favorable impact on the economy and social development include growth and development rates, foreign exchange outflow volumes, infrastructure development, innovative management practices, and training experience. A valuable economic source is the preservation of intangible cultural assets [35]. Therefore, wherever possible, the society, people, and, as necessary, the specific persons who represent such a heritage, must be included in conservation efforts.

Table 1 shows that intangible cultural heritage contributes to inclusive social development [16,36], environmental sustainability [16,37], inclusive economic development [16,35], and peace and security [16,38,39].

Second, based on the level of participation, the local community's attitude, knowledge, and awareness of LH conservation will be used to identify WHS conservation initiatives and cultural heritage education in this study. It has long been understood how crucial community participation is in the decision-making, implementation, and enforcement processes [39]. Numerous forms of community participation, from manipulative collaboration to citizen power, are discussed in the literature [40–44]. As a pioneer in this field, Arnstein (1969) proposed an eight-tier ladder of community participation divided into three categories: manipulative participation, citizen tokenism, and citizen power. Similar to this, Pretty (1995) created a typology of community involvement, which included manipulative participation, passive participation, and self-mobilization [42,45]. Tosun (1999, 2006) described three types of community participation in tourism development: coercive participation, induced participation, and spontaneous participation [45], combining the typologies of Arnstein (1969) and Pretty (1995).

Coerced residents are only marginally involved in development activities and have little control over decision-making or oversight [44,46]. Instead, governmental organizations and the private sector are in charge of monitoring the development of the tourism business [44,46]. Only by informing the community of planned projects and how those developments can benefit them can local governments engage the community [47]. According to Zhang et al. (2013), those in positions of power just need to tell the community about initiatives in order to fulfill their legal obligations and placate locals. In turn, this reduces opposition to the planned change. The residents' participation and opinions, however,

are not appreciated, and they have little practical power to influence the direction of the development [46].

Table 1. Intangible cultural heritage contributes to social, environmental, economic, and peace and security.

Contribution Category	Finding	Author					
		UNESCO, 2015 [16]	Petronela, 2016 [35]	S.-K. Tan et al., 2018 [36]	Ounanian, K. et al., 2021 [37]	Agarwal, S., 2018 [38]	UNESCO 2014 [39]
Inclusive Social Development	Intangible cultural heritage is vital to achieving food security.	✓					
	Traditional health practices can contribute to the well-being and Inclusive quality of health care for all.	✓					
	Traditional practices concerning water management can contribute to equitable access to clean water and sustainable water use.	✓					
	Intangible cultural heritage provides living examples of educational content and method.	✓					
	Intangible cultural heritage can help strengthen social cohesion and inclusion.	✓					
	Intangible cultural heritage is decisive in creating and transmitting gender roles and identities and, therefore, critical for gender equality.	✓					
	Intangible cultural heritage as a place attachment, sense of place, and place identity.			✓			
	Sense of loss when a lack of transmission of intangible cultural heritage knowledge and skills.			✓			
Environmental Sustainability	Intangible cultural heritage can help protect biodiversity.	✓			✓		
	Intangible cultural heritage can contribute to environmental sustainability.	✓			✓		
	Local knowledge and practices concerning nature can contribute to the research on environmental sustainability.	✓			✓		
	Knowledge and coping strategies often provide a foundation for community-based resilience to natural disasters and climate change.	✓			✓		
Inclusive Economic Development	Intangible cultural heritage is often essential to sustaining the livelihoods of groups and communities.	✓	✓				
	Intangible cultural heritage can generate revenue and decent work for many people and individuals, including poor and vulnerable ones.	✓	✓				
	Intangible cultural heritage, as a living heritage, can be a significant source of innovation for development.	✓	✓				
	Communities can also benefit from tourism activities related to intangible cultural heritage.	✓	✓				
Peace & Security	Many intangible cultural heritage practices promote peace at their very core.	✓					✓
	Intangible cultural heritage can help to prevent or resolve disputes.	✓					
	Intangible cultural heritage can contribute to restoring peace and security.	✓				✓	✓
	Protecting intangible cultural heritage is also a means to lasting peace and security.	✓			✓		
	Intangible cultural heritage in conflict-related emergencies.						✓

The second form of community participation, according to Tosun's (2006) typology, is induced community engagement, which is related to citizen tokenism in Arnstein's (1969) model and passive participation in Petty's (1995) typology. Despite the fact that they have a voice in the tourism development process and that decision-makers do pay attention to their ideas, residents do not actually have any impact or authority over the decision-making

process in induced community participation [44,46]. The decision-makers have the last word on whether to accept or reject suggestions made by residents during the planning and development process [45]. This type of community participation, also known as a public hearing or community consultation [48], usually occurs later in the planning process, after the majority of the concerns and options have been considered.

The various types of participation processes are shown in Table 2. Tosun (2006) describes the highest level of community participation as a spontaneous participation, Arnstein (1969) refers to it as citizen power, and Pretty (1995) refers to it as self-mobilization. Residents have the ability to make decisions and manage the development process through spontaneous participation. Spontaneous participation has the potential to increase resident trust, ownership, and social capital in contrast to the other two forms of conventional participation, which do not constitute effective participation and lead to conflicts [45,49]. All resident and stakeholder groups are actively involved throughout the entire participatory planning process due to spontaneous participation, which starts in the early stages of the planning process [44,48].

Table 2. The different types of participation processes.

Type / Components	Coercive Participation	Induced Participation	Spontaneous Participation
Level of Participation	Low level/Passive	Middle level/Responsive	High level/Active
Involvement	Negligible involvement (limited)	Passive involvement	Active involvement
Action	No actual power to make the decision and to control the development process.	No actual power to make decisions and control the development process.	Have the power to make decisions and control the development process.
Time involvement	Just get the information.	Usually, happen after development.	Early planning stage.
Input	Government, authorities, and the private sector exert their control.	Public hearing or community consultation.	Residents can generate trust, ownership, and social capital.

iii. Plan Action based on Community Perceptive

From the finding of assessing the community's strengths and needs, and gathering information on the community's attitude, cultural knowledge, and awareness toward living heritage conservation, the plan of action based on the community perceptive is the next step that will be investigated later, based on Cultural Heritage Education Programs (CHEP) in four case studies: Penang (Malaysia) [50], Singapore [51], the Philippines [52], and Europe [53], to identify the elements of learning content, learning preferences, and teaching-learning technique in this study. In addition, the comparison of the best practices of community-based education for living heritage site conservation in these four case studies was made by Aziz et al. [54].

2.3. CBE for LH toward Sustainable Community

In a sustainable community, multiple human needs are taken into account and satisfied, not just one at the expense of the others [55]. It is a setting where people from all backgrounds and perspectives can feel comfortable and welcomed, where all groups can take part in decision-making, and where prosperity is shared. A sustainable community balances the requirements of the present with the conservation of sufficient economic, social, and environmental resources for future generations [56,57]. There are eight component keywords to create a sustainable community, which is a community [58,59] that is: (1) well run; (2) active, inclusive, and safe; (3) sensitive to the environment; (4) thriving; (5) fair for all; (6) well connected; (7) well served; and (8) well designed and built (shown in Figure 2). Through the CBE model for LH, showing a well-run community is a first and second step to involving local people in all community-to-community decision-making processes,

forming a vision, and overall enjoying civic values, responsibility, and pride for achieving the goal of survival of the living heritage. A significant part of CBE for LH is establishing a community's vision and goals since it forms the basis for a strategy consultation that provides guidance on how and when the strategy might be used, either independently or in collaboration with other strategies [60]. As a result of this formulation, the vision and goals of CBE for LH will be formed as a guide for providing a top-notch education.
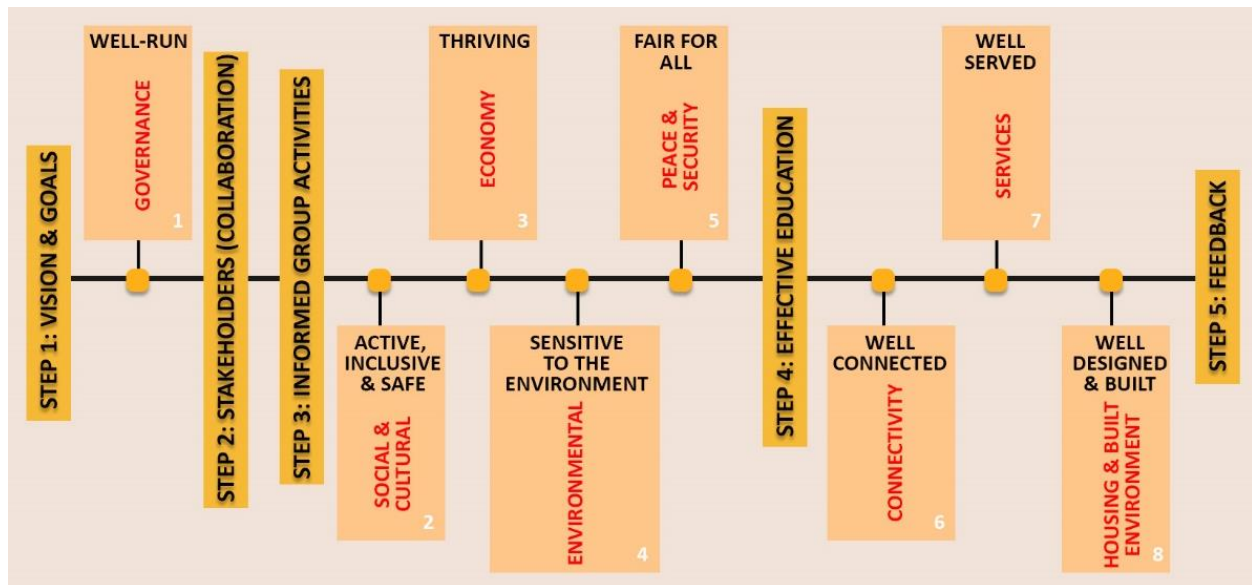
Figure 2. Building capacity: applying the principles of community-based education for living heritage toward sustainable community.

The third step in the CBE model for LH is information-gathering activities to identify the level of community strength, community needs, and community basic knowledge about cultural heritage. Through this step, the data of the results of each level of strength, need, and knowledge, and will take action plans based on the perspective of the community to create an active, inclusive, and safe community in social and cultural, thriving, sensitive to the environment, and fair for all. An active, inclusive, and safe community is a true sense of community where neighbors look out for each other, welcome to join events, and where there is healthy respect between cultures, and all are treated equally. In general, the community has the opportunity to earn money and achieve a good quality of life through the knowledge and skills of the living heritage provided by encouraging the community to open local businesses, create jobs for others, and spend and invest locally in a thriving community. Environmentally sensitive communities are communities that practice healthy lifestyles by actively trying to minimize climate change by encouraging recycling, water conservation, and by maintaining a cleaner, safer, and greener neighborhood. A fair community for all is where every individual of all ages, races, gender, and disabilities, is taken into account and given equal access to jobs, services, and education in the community.

The fourth step in the CBE model for LH is the formation of effective education where the knowledge and skills of living heritage provided and taught will create a community that is well-connected, well-served, and well-designed and built. A well-connected community promotes safe walking on heritage trails while connecting neighborhoods between communities and has communications connecting people to jobs, health, and other services. A well-served community is a community that provides good services in terms of easy access to fresh food and raw materials, high-quality and accessible family services, including healthy options for the community that is available and affordable, and volunteer and private services. Finally, a well-designed and well-built community has a real sense of place, positive purpose, and local character where heritage buildings are not

only attractive but also safe. It also has local activities that are still maintained and valuable and provide plenty of green and open space for people to spend time relaxing and playing. The fifth step in the CBE for LH model is the feedback that influences the vision and goals for quality education for living heritage. It ensures that CBE for LH runs smoothly and makes improvements if necessary.

3. Materials and Methods

This study uses the quantitative method of questionnaire survey technique to collect data on the communities' attitudes, cultural knowledge, and awareness of the importance of living heritage and their participation level towards living heritage conservation in Melaka UNESCO World Heritage Site. There were 392 respondents from the multicultural community of Melaka World Heritage Site, who randomly responded in July 2020.

3.1. Sample and Sampling Method

The survey tool for this study is an online questionnaire created with Google Forms. The questions were chosen because it related to the category of people's opinions, attitudes, and behavior [61]. Additionally, a questionnaire can minimize the interviewer's influence on the participants' responses [61]. According to the Department of Statistics Malaysia [62], the local community of Melaka WHS has respondents ranging in age from 15 to 64 years old who are of working age and are able to understand and express ideas.

3.2. Survey Instrument

The questionnaire was divided up into several sections, with questions about: (i) demographic data, (ii) the significance of LH, and (iii) the level of participation. To help answer the research questions about the level of community members' views, cultural knowledge, and awareness, the questionnaire included closed-ended questions. While the participation level comprises six (6) items across three (3) stage levels, the importance of LH has ten (10) items across four (4) factors of contribution. The 5-point Likert scale was used for the entirety of the response options in this study. The Likert Scale is an illustration of a composite assessment used to improve measurement standards in social research [63]. The scale in this study includes standard response categories such as "strongly disagree", "disagree", "partially agree", "agree", and "strongly agree", in order to determine the relative weight of each item.

3.3. Data Analysis

The data was transformed to digital form using SPSS 22.0. Both "user missing" (data that was absent during analysis and modification) and "missing system" types of missing data exist (utterly absent from the data as the respondent fails to answer it). In this work, there were no user-missing data. To determine if the missing data in the system was random, the author applied missing value analysis. It found out that it was. Similar to this, the patterns of the missing data had been investigated; however, no systematic pattern had been found, and the missing data were random [64].

To confirm that the data was internally consistent, a reliability test was carried out. In order to achieve the research objective, descriptive analysis is used to determine the demographic differences among respondents, the mean value of LH, and the level of participation. According to several studies, mean values are the best method for analyzing data from Likert scales as far as the validity of the analyses is concerned [65,66].

To check for a strong relationship and significance between the data, a correlation was conducted. Reliability is the measure of the internal consistency of the constructs in this study. A construct is reliable if the Alpha (α) value is greater than 0.70 [67]. Construct reliability was assessed using Cronbach's Alpha. The results revealed that the participation level scale with six items ($\alpha = 0.882$) and the importance of the LH scale with ten items ($\alpha = 0.944$). Reliability results are shown in Table 3.

Table 3. Reliability statistics of the participation level and the importance of LH.

Constructs	No. of Items	Alpha (α)
Participation level	6	0.882
Importance of LH	10	0.944

4. Results and Discussions

The continued use of heritage by the community it is linked with for the original purpose for which it was created is what is known as "Living Heritage" (LH). It has a unique bond to a community. As change is accepted as a component of the living nature of the heritage place, it is exposed to a continuous process of evolution as a result [68]. Melaka was chosen as a case study for this study. Melaka State, which is situated on the west coast of the central Peninsular of Malaysia, is bordered to the west by the Straits of Malacca, to the north by the State of Negeri Sembilan, and to the south by the State of Johor (shown in Figure 3).

Figure 3. Location of the study.

The city of Melaka and George Town in Penang was designated as UNESCO World Legacy Sites on July 7, 2008, in recognition of their distinctive multicultural living heritage that dates back to the trade routes and the outstanding universal values (OUV). The historic cities of the Straits Settlements are comprised of them all. The following is how UNESCO described Melaka's outstanding universal values in the inscription as a WHS [68]:

- Remarkable displays of multicultural trade towns formed by the commercial exchanges of Malay, Chinese, Indian, and European cultures, as well as the influences of architecture, urban form, technology, and monumental art;
- A tangible and intangible manifestation of the colonial influences and the multicultural heritage of Asia and Europe, exemplified by the diversity of religious structures of various faiths, ethnic communities, numerous languages, worship and religious festivals, dances, costumes, art, music, food, and daily life;
- A mixture of elements that have created an unmatched architecture, culture, and urban environment in East and South Asia. Primarily the unique variety of townhouses and shophouses, each in a different stage of development.

The Melaka city region was needed to safeguard its distinctive tangible and intangible cultural characteristics due to its designation as a World Heritage Site. As a result, altering or destroying the look of its historic structures is prohibited. Melaka also needs to raise awareness of the WHS, particularly among its communities, foster a sense of ownership, and build support by highlighting its importance. The estimated population distribution

by ethnic group in Melaka is shown using data from Table 4 [69]. Three hundred and eighty-four (384) samples are needed to represent one million populations with a 95% confidence level and a 5% error margin. A total of three hundred and ninety-two (392) respondents were chosen at random to participate in the data collection.

Table 4. Melaka—estimated population by ethnic group, readapted data with permission from Ref. [69].

Ethnic Group	2020		Sample Size	Actual
	Percentage (%)	Population	Data Collection	Data Collection
Malay	71.7	715,872.9	275	268
Chinese	22.1	220,652.6	85	50
Indian	5.6	55,912.0	22	13
Others	0.6	5990.6	2	61
Total	100	998,428	384	392

The results for this paper focused on gathering information, part of which is respondents' attitudes, cultural knowledge, and awareness of the importance of LH and the participation level. Data collection for this study used an online google form questionnaire and was randomly responded from the Melaka local community.

There are three hundred and ninety-two respondents. In the demographic data for gender, there are 193 male (49.2%) and 199 female (50.8%) respondents; seven respondents are different in gender. There are five groups of middle age level which is: (1) 15–24, (2) 25–34, (3) 35–44, (4) 45–54, and (5) 55–64. The higher range level of age was 25–34, with 98 respondents (25%). Malay was the higher number of respondents in the race categories with 268 respondents (68.4%), following the estimated Melaka population by ethnic group [67]. Other races included Portuguese, Nyonya baba, and mixed ethnic. These demographic data results (shown in Table 5) are used in the crosstab of the comparison mean in the importance of LH and the participation level.

Table 5. Respondents' demographic data in gender, age level, and race (*n* = 392).

Demographic	Variable	Frequency	Percentages %
Gender	Male	193	49.2
	Female	199	50.8
Age Level	15–24	79	20.2
	25–34	98	25.0
	35–44	85	21.7
	45–54	94	24.0
	55–64	36	9.2
Race	Malay	268	68.4
	Chinese	50	12.8
	Indian	13	3.3
	Others	61	15.6

4.1. Respondents' Attitude, Cultural Knowledge, and Awareness of the Importance of Living Heritage

There are 10 variables of the importance of LH (shown in Table 6), which are four variables in social contribution (SC1, SC2, SC3 and SC4), two variables in economic contribution (EC1 and EC2), two variables in environmental contribution (EN1 and EN2), and two variables in peace and security contribution (PS1 and PS2). Nine out of 10 variables mean they are in the high level (4: agree), just one variable was in the moderate level (3: partially agree) in the environmental contribution. The EN1: "Knowledge and practice of cultural heritage accumulated over time to make sustainable use of natural resources and minimize the impact of climate change", with a 3.97 mean (red highlighted). This knowledge and practice of cultural heritage accumulated over time to make sustainable use of natural resources and minimize the impact of climate change, needs to be highlighted to

provide information in CBE for LH to create an adequate education. Still, many respondents are unaware that this important variable can change our life if we practice it daily as our routine. The highest mean in social contribution was SC2: the loss of cultural heritage caused losses to the community in Melaka, with a 4.36 mean (blue highlighted). Most of the respondents were aware of the importance of this variable in the community.

Table 6. The overall means of attitude, cultural knowledge, and awareness of the importance of LH are based on respondents' perspectives (*n* = 392).

Importance of LH	Code	Variable	Mean	SD
Social: SC	SC1	The cultural heritage in Melaka as my image, identity, and pride.	4.32	0.86
	SC2	The loss of cultural heritage caused losses to the community in Melaka.	4.36	0.84
	SC3	I am responsible for practicing my cultural heritage for its continuity in the future.	4.14	0.90
	SC4	The continuity of heritage culture terminates when there is a lack of transmission.	4.20	0.82
Economic: EC	EC1	Knowledge, skills, and cultural heritage practices contribute to economic improvement and living standards.	4.14	0.85
	EC2	The originality of the culture is lost, and natural resources are destroyed when there is a lack of awareness in the new development management.	4.22	0.83
Environmental: EN	EN1	Knowledge and practice of cultural heritage accumulated overtime to make sustainable use of natural resources and minimize the impact of climate change.	3.97	0.92
	EN2	The cultural heritage in Melaka contributes to the continuity between the past, present, and Future in the environment setting.	4.33	0.84
Peace & Security: PS	PS1	Appreciation and understanding of cultural differences between communities create harmony in daily life.	4.27	0.81
	PS2	An unpeaceful environment occurs when there is a lack of understanding of cultural differences in the community.	4.18	0.83

The Comparison Means of Attitude, Cultural Knowledge, and Awareness in Gender, Age Level, and Race of the Importance of Living Heritage

In this subsection, the comparison means of attitude, cultural knowledge, and awareness in gender, age level, and race of the importance of LH are based on respondents' perspectives on social, economic, environmental, and peace and security contributions, are shown in Table 7. Most of the mean of the importance of LH is high level (4: agree), just some variables in moderate level (3: partially agree).

In the gender group, males have a moderate level (3: partially agree) of knowledge awareness of the importance of LH in environmental contribution (EN1) compared to females, that have a high level (4: agree). Therefore, more focus on the male gender must be highlighted to provide information in CBE for LH to create an effective education.

The same variable on the importance of LH in environmental contribution (EN1) has a comparison in the age level group. The age level groups more senior in 45–55 and 55–64 have a high level (4: agree) meanwhile a middle age level group of 15–24, 25–34, and 35–44 have a moderate level (3: partially agree). Recommendation to create an effective education

in CBE for LH, more focus on a middle-age level group of 15–24, 25–34, and 35–44 must be highlighted and taken into consideration.

Table 7. The comparison means of attitude, cultural knowledge, and awareness in gender, age level, and race of the importance of LH is based on respondents' perspectives on social, economic, environmental, and peace and security contributions.

	N	SC1	SC2	SC3	SC4	SC	EC1	EC2	EC	EN1	EN2	EN	PS1	PS2	PS
Overall	392	4.32	4.36	4.14	4.20	4.25	4.14	4.22	4.18	3.97	4.33	4.15	4.27	4.18	4.23
Gender															
Male	193	4.31	4.33	4.09	4.21	4.24	4.10	4.24	4.17	3.91	4.31	4.11	4.26	4.13	4.20
Female	199	4.33	4.39	4.18	4.19	4.27	4.18	4.21	4.19	4.04	4.36	4.20	4.29	4.22	4.25
Age Level															
15–24	79	4.28	4.23	4.03	4.16	4.17	4.11	4.10	4.11	3.94	4.19	4.06	4.22	4.09	4.15
25–34	98	4.14	4.32	4.03	4.19	4.17	4.12	4.26	4.19	3.92	4.18	4.05	4.19	4.09	4.14
35–44	85	4.33	4.38	4.21	4.31	4.31	4.19	4.25	4.22	3.96	4.40	4.18	4.29	4.25	4.27
45–54	94	4.43	4.46	4.17	4.12	4.29	4.10	4.19	4.14	4.03	4.48	4.26	4.27	4.18	4.22
55–64	36	4.58	4.47	4.39	4.28	4.43	4.22	4.42	4.32	4.08	4.50	4.29	4.58	4.44	4.51
Race															
Malay	268	4.35	4.45	4.16	4.31	4.32	4.21	4.30	4.26	4.04	4.40	4.22	4.31	4.25	4.28
Chinese	50	4.16	4.22	4.00	3.98	4.09	4.00	4.10	4.05	4.00	4.16	4.08	4.08	4.08	4.08
Indian	13	4.23	3.85	4.00	3.92	4.00	4.15	4.23	4.19	3.62	4.00	3.81	4.23	3.85	4.04
Others	61	4.33	4.20	4.15	3.95	4.16	3.92	3.97	3.94	3.74	4.26	4.00	4.28	4.00	4.14

Noted: red highlighted was moderate level.

Based on race group, 10 out of 10 of the mean variables of the importance of LH in high level (4: agree) in the Malay race responded. In the Chinese race, it was just a variable SC4 at a moderate level (3: partially agree). In the Indian race, four out of 10 of the mean was in moderate level (3: partially agree) was SC2, SC4, EN1, and PS2. Lastly, in other races, four out of 10 of the mean was in moderate level (3: partially agree) was SC4, EC1, EC2, and EN1. It is recommended in creating an effective education that every variable at a moderate level (3: partially agree) in the race must be highlighted and taken into consideration to increase the knowledge and awareness in CBE for LH.

Most of the mean of the importance of LH in high level (4: agree) just some contributions in moderate level (3: partially agree), especially in race group. The Indian race was at a moderate level (3: partially agree) in environmental contributions, meanwhile other races who were at a moderate level (3: partially agree) were in economic contributions. It must be highlighted or taken into consideration in creating an effective education to increase the knowledge and awareness in CBE for LH.

4.2. Respondents' Attitude, Cultural Knowledge, and Awareness of the Participation Level

There is six variables of the participation level, which is two variables in the low level (L1 and L2), two variables in the middle level (M1 and M2), and two variable in the high level (H1 and H2). Two out of six variables mean at moderate level (3: partially agree), meanwhile others were at low level (2: disagree).

The overall means of attitude, cultural knowledge, and awareness of the participation level are based on respondents' perspectives are represented in Table 8. The highest mean variable in high participation level (decision-making) was H1: I am interested in volunteering and participating from the beginning until the end, with a 3.18 mean (blue highlighted) in the moderate level (3: partially agree). Meanwhile, the lowest mean variable in the middle participation level (collaboration) was M2: I meet with local authorities and state government officials to discuss the issues, with a 2.51 mean (red highlighted) in the low level. Most respondents lack collaboration with local authorities and state government officials in discussing LH education and conservation issues. This makes information regarding LH education and conservation very low or late received in the local community.

Table 8. The overall means of attitude, cultural knowledge, and awareness of the participation level are based on respondents' perspectives (*n* = 392).

Participation Level	Code	Variable	Mean	SD
Low: L (Information)	L1	I get involved and keep up with the news regarding this conservation.	3.01	1.11
	L2	I am familiar with this conservation.	2.83	1.08
Middle: M (Collaboration)	M1	I receive information and do what local authorities and state government officials ask.	2.98	1.17
	M2	I meet with local authorities and state government officials to discuss the issues.	2.51	1.17
High: H (Decision Making)	H1	I am interested in volunteering and participating from the beginning until the end.	3.18	1.20
	H2	I in my community have the power to change the decisions taken by local authorities and state government officials.	2.77	1.31

The Comparison Means of Attitude, Cultural Knowledge, and Awareness in Gender, Age Level, and Race of the Participation Level on Low, Middle, and High Levels

Table 9 shows the comparison means of attitude, cultural knowledge, and awareness in gender, age level, and race of the participation level based on respondents' perspectives on low, middle, and high levels. Most of the mean of the participation level is in the low level (2: disagree), just some variables in the moderate level (3: partially agree). Participation was the most important part of doing a project to be successful, so the increase of participation level to ACTIVE in CBE for LH conservation must provide the best information and practical education to attract local community involvement and empowerment.

Table 9. The comparison means of attitude, cultural knowledge, and awareness in gender, age, and race of the participation level is based on respondents' perspectives on low, middle, and high levels.

	N	L1	L2	L	M1	M2	M	H1	H2	H
Overall	392	3.01	2.83	2.92	2.98	2.51	2.75	3.18	2.77	2.97
Gender										
Male	193	2.98	2.83	2.91	2.96	2.53	2.75	3.21	2.80	3.00
Female	199	3.04	2.83	2.94	3.01	2.48	2.74	3.15	2.73	2.94
Age Level										
15–24	79	3.23	2.99	3.11	3.13	2.63	2.88	3.63	3.11	3.37
25–34	98	2.99	2.87	2.93	3.12	2.62	2.87	3.24	2.88	3.06
35–44	85	3.14	2.86	3.00	3.12	2.68	2.90	3.34	2.78	3.06
45–54	94	2.79	2.63	2.71	2.68	2.21	2.45	2.72	2.44	2.58
55–64	36	2.89	2.89	2.89	2.78	2.28	2.53	2.78	2.53	2.65
Race										
Malay	268	3.05	2.86	2.95	3.10	2.57	2.84	3.32	2.81	3.07
Chinese	50	3.04	2.88	2.96	2.84	2.44	2.64	3.28	3.00	3.14
Indian	13	3.00	2.92	2.96	3.15	2.54	2.85	3.15	2.85	3.00
Others	61	2.84	2.67	2.75	2.54	2.26	2.40	2.44	2.34	2.39

Noted: red highlighted was low level.

In the gender group, males only have one variable in the moderate level (3: partially agree) in high participation level H1 compared to females with three variables in the moderate level (3: partially agree) L1, M1, and H1. Its recommendation is to focus more on the male gender to improve the participation level in creating an effective education of CBE for LH.

Six out of six of the mean participation levels in the age level groups more senior in 45–55 and 55–64 have a low participation level (2: disagree) compared to a middle age level group of 15–24, 25–34, and 35–44. More interesting activities and interactive education need to focus on the age level groups 45–55 and 55–64 in creating an effective education of CBE for LH.

Based on the race group, six out of six of the mean variables of the participation level in the low level (2: disagree) in other races responded compared to the Malay, the Chinese, and the Indian races. Its recommendation in creating an effective education that every variable in participation level in the race must be highlighted, especially in other races to increase the knowledge and awareness in CBE for LH.

In creating an effective education, the L2 and M2 variable must be focused on every gender, age level, and race group of the participation level because it means in the low level (2: disagree). Meanwhile, the middle level (collaboration) of participation level must be focused on every gender, age level, and race group of the participation level because it means also in the low level (2: disagree).

5. Recommendation

H1. *There are significant participation levels and the importance of living heritage*.

Pearson product correlation of the participation level and the importance of LH was found to be very low positive in Table 10, and statistically significant (r = 0.254, $p < 0.001$). H1 was supported. This shows that an increase in the participation level to ACTIVE would lead to a higher altitude, cultural knowledge, and awareness of the importance of LHs in the local community.

Table 10. Correlation analysis of the participation level and the importance of LH.

	Participation Level	Importance of LH
Participation level	1	0.254 **
Importance of LH	0.254 **	1

** Correlation is significant at the 0.01 level (2-tailed).

Table 11 summarizes the analysis of the level of participation and the importance of LH. To increase cultural knowledge and awareness in both categories, the male gender is the one that is given more attention. Several studies have found that, on average, males do better on general knowledge assessments than females [70–72], but this study argues against that finding since the differences are most likely the result of various interests that male and female each has.

Table 11. Summary analysis of the participation level and the importance of LH.

	The Importance of LH	Participation Level
Gender	Focused more on the male gender.	Focused more on the male gender.
Age Level	More focused on a middle-aged level group of 15–24, 25–34, and 35–44 to increase cultural knowledge and awareness.	Focused on the age level groups 45–55 and 55–64. Creating more interesting activities and interactive education.
Race	The Indian race needs to focus on environmental contributions meanwhile other races in economic contributions.	Every variable in participation level in the race must be highlighted, especially in other races.
Overall	The EN1 variable must be highlighted in every gender, age, and race group the importance of LH to increase cultural knowledge and awareness.	The L2 and M2 variable must be highlighted in every gender, age, and race group of the participation level, especially the middle level (collaboration).

At the age level group, there are comparisons in the importance of LH and the participation level. This is the importance of LH the focused on a middle-age level group of 15–24, 25–34, and 35–44 to increase cultural knowledge and awareness compared to the participation level, focused on the age level groups 45–55 and 55–64 to create more interesting activities and interactive education. In addition, individuals in the oldest age

group reported role loss more frequently than participants in the younger age groups. Reduced physical capacity, the development of disease, and functional limitations, may all be linked to decreased participation level, which is more common among older age groups [73].

The Indian race needs to focus on environmental contributions meanwhile, other races in economic contributions in the importance of LH. Meanwhile, every variable in participation level in the race must be highlighted, especially in other races.

The importance of LH to increase cultural knowledge and awareness, while the L2: I am familiar with this conservation, and M2: I meet with local authorities and state government officials to discuss the issues, must be highlighted for overall analysis. The EN1: Knowledge and practice of cultural heritage accumulated over time to make sustainable use of natural resources and minimize the impact of climate change must be highlighted in every gender, age level, and race group (collaboration).

The new direction for future investigations is the CBE Framework for LH conservation and the community participation level toward sustainable development at the World Heritage Site (WHS) in Malaysia.

6. Conclusions and Implications

In conclusion, increasing participation in ACTIVE would lead to greater attitudes, cultural knowledge, and awareness of the importance of LHs in the community. The overall analysis of participation levels and the importance of LH as a general guide to raising community awareness, cultural understanding, and altitudes. If this LH is not maintained, the community suffers losses in terms of identity, image, sense of place, and sense of pride. Therefore, further research is required to determine the research topic of heritage educational programs, preferred learning styles, and teaching methods in CBE for LH conservation.

Due to resource constraints (time and financial), this research study only managed to research into one case study, the Melaka WHS, with returned and answered questionnaires by 392 local community. One of the most challenging and time-consuming parts of the field research exercise was due to the COVID-19 situation, the face-to-face data collection needed to change to online. The feedback from the local community took about half a year to complete. However, based on the amount of feedback and commitments received, it is more than sufficient to generalize the results, and therefore, the result highlighted in this research study is hopefully found to be trustworthy to represent the population of the Melaka WHS. An in-depth evaluation of cultural heritage education and current practices of heritage site management for the living heritage sites in Malaysia should be carried out by researchers. Indeed, this research study was based on one case study in one state in Malaysia only. In order to enhance research findings, a more thorough study needs to be carried out in every state in Malaysia where there are living heritage sites. This will prove whether the problems of cultural knowledge and participation level in cultural heritage education are similar or unique only to Melaka WHS, based on the findings from the other states. Although the recommendation aspect was highlighted in the results have shown that, it could be 'implementable', the details of the implementation aspects were not discussed because this recommendation would need to be studied in depth on the suitability and problems of implementation in real practice.

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Conceptualisation of heritage diplomacy in scholarship

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ABSTRACT

Heritage diplomacy is a recent concept and a new area of interest in the expanding scope of diplomacy. The concept is explored with various epistemological foci and theoretical frameworks in Western scholarship. It is often used to describe joint international projects or government initiatives abroad for preserving tangible cultural heritage. Several recent studies link heritage diplomacy to attempts to develop reciprocal relations between countries, regions, and/or communities through cultural heritage based on dialogue. This article contributes to interdisciplinary scholarship on heritage diplomacy by clarifying the concept, including its inherent notions of cultural heritage and approaches to power. Our critical close reading of 57 sampled scholarly publications reveals how heritage diplomacy is commonly approached from a conservationist point of view, emphasising the preservation of tangible cultural heritage through knowledge exchange, material aid, and funding. Scholarship lacks studies focusing on the uses of intangible cultural heritage for heritage diplomacy. The study reveals heritage diplomacy scholars' shared interest in power asymmetry and struggle: the concept can be used to recognise and deconstruct power hierarchies between heritage communities. We do this by understanding cultural heritage as a contact zone of people-to-people connectivity, reciprocal cooperation, mutual trust, and dialogue.

Introduction: increasing interest in the entanglement of cultural heritage and diplomacy

During the past few years, policymakers, cultural managers, and scholars have become increasingly interested in the social value of cultural heritage. Its potential for initiating and strengthening cooperation between and within heritage communities has been recognised, as has its value for creating diplomatic relationships as part of international heritage governance and states' foreign policy. Recently, scholars have explored these linkages between cultural heritage and diplomacy with various emphases and conceptualisations. This interdisciplinary research combines diverse human sciences, including international relations, law, public policy and governance, history and critical heritage studies. Scholars have critiqued the instrumentalisation of cultural heritage for political purposes, which, intentionally or not, may maintain or create hierarchical power relations (e.g. Luke and Kersel 2012; Kersel and Luke 2015; Meskell 2015; Carruthers 2016; Peycam 2016; Hafstein 2018; Winter 2019; Andersen, Clopot, and Ifversen 2020). At the same time, various recent studies (e.g. Andersen, Clopot, and Ifversen 2020; ECHOES 2020; Clopot, Andersen, and Oldfield 2022; Čeginskas and Kaasik-Krogerus forthcoming) emphasise the importance of developing

reciprocal relations through cultural heritage based on dialogue. Conceptual plurality and ambiguousness reflect the ways in which scholars have linked the notions of cultural heritage and diplomacy and approached the concerns and potentials associated with this entanglement.

Heritage diplomacy is a new area of interest in the expanding scope of diplomacy. Although cultural heritage has been used for diplomatic endeavours since Pharaonic Egypt and Ancient Greece and Rome (Black 2010), explicit explorations of the concept are more recent. In the 2010s, critical heritage scholars have increasingly explored heritage diplomacy due to the launch of several political initiatives and policies worldwide seeking to link cultural heritage and diplomacy. These include the Chinese Belt and Road Initiative launched in 2013 and the European Union's document 'Towards an EU strategy for international cultural relations' published in 2016. The research on heritage diplomacy reflects recent intertwined political, social, and cultural movements in Western societies focused on global inequality, including debates on cultural appropriation, decolonisation, repatriation of cultural heritage, and recognition of indigenous knowledge and heritage practices.

Conceptual clarity has not arisen from this increase in scholarship. Case studies on heritage diplomacy reflect different geopolitical contexts and are based on divergent epistemological approaches and academic disciplines. Thus, the concept is used with various emphases and meanings: as an analytical tool, it remains ambiguous and vague. Motivated by this plurality and ambiguity, in this article we aim to clarify what heritage diplomacy means by exploring scholars' use the concept, including their notions of cultural heritage and approaches to power.

In this article, we focus on the conceptual entanglement of cultural heritage and diplomacy and explore how the linkages between them are explained, theoretically framed, and conceptually developed in scholarship. Our core research questions are: How has heritage diplomacy been conceptualised in scholarship and what is the concept's interdisciplinary potential? Our data consists of sampled scholarly publications, which we perceive as a discursive space to construct the meanings of heritage diplomacy and define the conceptual linkages between cultural heritage, diplomacy, and various forms of power. To serve scholars exploring the practices and policies of heritage diplomacy, we conclude by proposing how the concept could be approached and defined in future research.

The recent scholarly interest in the uses of cultural heritage for diplomatic endeavours reflects the development of scholarship that both responds to and actively participates in the above-mentioned political, social, and cultural movements. In the 2000s, research on cultural heritage faced a paradigm shift in Western academia (e.g. Smith 2006; Harrison 2013a, 2013b; Lähdesmäki, Zhu, and Thomas 2019). This shift has broadened the field of heritage studies beyond conservation of heritage, although conservation still is an important area in the field (Lähdesmäki, Zhu, and Thomas 2019), to pivot on a question of power: the ability of discourses and practices in cultural heritage to both create and dismantle power relations. This research has drawn from poststructuralist and Foucauldian perspectives on power, borrowing from postcolonial, racial, gender, and subaltern studies and new museology developed in the 1970s and 1980s (Lähdesmäki, Zhu, and Thomas 2019). Scholars drawing on such critical perspectives have sought to deconstruct the role of cultural heritage in monocultural nation-building projects, transmitting elitist cultural canons, and upholding Western cultural values. As a part of this paradigm shift, consensuses on the ideas of nation and national identity have been questioned and contested by alternative identity claims and/or plural heritage narratives (Smith 2006; Ashworth, Graham, and Tunbridge 2007; Labadi 2007; Lähdesmäki, Zhu, and Thomas 2019). Besides nationalism, critical scholars have scrutinised how several other 'grand narratives', such as 'imperialism, colonialism, cultural elitism, Western triumphalism, social exclusion based on class and ethnicity, and the fetishizing of expert knowledge' (Smith 2012, par. 2; see also 2006), have dominated the meaning-making and practices of cultural heritage, both in the 'West' and, through its dominance, elsewhere in the world. These narratives and the ideas and ideologies they include have influenced what has been understood and defined as cultural heritage by privileging 'old, grand, prestigious, expert approved sites, buildings, and artefacts that sustain Western narratives of nation, class and science' (Smith 2012, par. 3).

The critical approach to power in the research of cultural heritage has had major political implications. First, it has revealed the role of cultural heritage in creating social relations. Recent research has brought out various oppressed, colonised, marginalised, and silenced heritage narratives as well as emancipatory and empowering narratives, thus emphasised the diversity of cultural heritage and linked it to the pursuit of justice and rights today (e.g. Whitehead et al. 2019; Andersen, Clopot, and Ifversen 2020; Knudsen et al. 2022). Second, the critical approach has changed the very idea of cultural heritage and its function within communities and societies, and in their internal and external relations. The critical approach builds on the notion that cultural heritage is proactive, that is, it 'does' things through how heritage is discussed, used, and managed (Harrison 2013a, 2013b). Cultural heritage is seen as actively transmitting values, social norms, and political ideas; establishing worldviews and power relations but also questioning them; strengthening or oppressing identities and feelings of belonging; creating dialogue and reciprocity or leading to confrontation in or between communities, and so forth (see Smith 2006; Harrison 2010, 2013a, 2013b; Lähdesmäki, Zhu, and Thomas 2019; Whitehead et al. 2019; Lähdesmäki et al. 2020). Drawing predominantly on critical heritage studies, our theoretical approach to heritage diplomacy builds on this proactive understanding of cultural heritage and critical emphasis on power. Moreover, we take the constructivist perspective on language use. Concepts, such as heritage diplomacy, are linguistic constructions used to order and understand abstract and ambiguous phenomena. Concepts are not neutral means of explanation but scholars explicitly and implicitly 'engineer' their meanings (Kuutma 2012; Lähdesmäki 2016).

Our exploration of heritage diplomacy is structured into four sections. We start by introducing our data and methods. The data is then explored in two more sections: in one, we discuss the meaning-making and definitions of heritage diplomacy in scholarship and the notions of cultural heritage embedded them. In the other, we explore how the idea of heritage diplomacy has developed in scholarship and reflects the broader conceptual contexts of (international) cultural relations. Fourthly, we explore the use of power and power relations embedded in the conceptualisations of and approaches to heritage diplomacy. The conclusion draws together the main findings and arguments of the article with suggestions for how to approach heritage diplomacy in future critical heritage studies and in interdisciplinary research.

Data and methods

Ambiguous and fluid concepts – particularly recent ones that are not yet established – can be used in various contexts and include diverse meanings that are more or less theoretically rigorous (Soini and Birkeland 2014; Lähdesmäki 2016). To investigate the conceptualisation of heritage diplomacy in scholarship, we gathered 57 scholarly publications through two sampling methods. The first sample was based on English-language scholarly publications (journal articles, review articles, book chapters, and books) found from interdisciplinary ProQuest and JSTOR databases with search term 'heritage diplomacy'. This sample included 41 texts published between 2012 and 2021. For both databases, the search tool failed to identify certain publications we had previously found in our broader review of literature on international cultural relations and cultural diplomacy. Therefore, we decided to broaden the results by adding a second sample of 16 more publications (scholarly articles and book chapters) that explicitly refer to heritage diplomacy. Together, both samples extend our interdisciplinary approach to the concept beyond few widely cited authors to include less-known voices. We do not refer to all 57 publications here, but we have marked those to which we refer with an asterisk in our list of references.

Heritage diplomacy affects different areas of scholarship. JSTOR and ProQuest are central, frequently used databases in humanities and social sciences, which offer access to a very broad range of scholarly journals, periodicals, books, collections, and other sources within *and* across multiple fields. JSTOR claims to provide more than 12 million academic journal articles, 85,000 books, and 2 million primary source documents in 75 disciplines in English and other languages.

We decided to limit our search to scholarly articles and book chapters published in English both to narrow the scope and to address an international audience in this scholarly journal. English has become a global *lingua franca* in academic research and cooperation, and scholars writing in other languages are increasingly asked to publish their key research in English in order to increase their impact. This applies to the authors of the selected publications on which we draw, who represent different disciplines and differing approaches to heritage diplomacy based on their various national and cultural backgrounds.

To understand the conceptualisation of heritage diplomacy, including the notions of cultural heritage and the approaches to power it contains, we examined the data in the light of our research question through critical close reading. The method of close reading concerns the broad category of interpretative explorations that enable detailed analysis of linguistically communicated phenomena at semantic, structural, representational, and sociocultural levels. Close reading originates in literary studies, where it has been associated with New Criticism (Dubois 2003, 2). In this context, the method aims at the 'mindful, disciplined reading of an object with a view to deeper understanding of its meanings' (Brummett 2010, 3). It has been subsequently employed in social sciences (Gallop 2007, 183–184; Norocel et al. 2020), where the context surrounding the analysed data is also considered. Critical close reading entails interpretative and hermeneutically oriented analysis, aiming to understand the meaning-making and functioning of power in the explored phenomenon. In our study, we conducted critical close reading as interactive teamwork: our remarks on the conceptualisation of heritage diplomacy were constantly discussed and jointly structured into meaningful units.

Meaning-making of heritage diplomacy and notions of cultural heritage

Next, we discuss how scholars in our data approached and defined the concept of heritage diplomacy by linking it to certain types of heritage, practices of fostering it, and actors seen as central for such practices. Our discussion proceeds from the most common understandings of heritage diplomacy to attempts to reinterpret or restructure the existing approaches.

In our data, heritage diplomacy is typically approached from a perspective of cultural heritage stewardship (see Billore 2021), which emphasises the importance of international action and collaboration in sustainably conserving and transmitting cultural heritage for future generations. The studies address the role and responsibility of various stakeholder engagements in the preservation, restoration, and revitalisation of cultural heritage-based resources and practices through academic involvement, technical and financial support, and a communities-based approach in international relations (e.g. Luke 2012a; Luke and Kersel 2012; Winter 2014; James 2016; Peycam 2016; Larsen and Buckley 2018; Svensson and Maags 2018). This conservationist approach builds on a traditional Western notion of what cultural heritage is by emphasising its material continuity and authenticity (see Stille 2002). Most of the studies in our data explore joint international projects or government-initiated activities abroad for preserving tangible cultural heritage (particularly archaeological sites, historical buildings, and monuments) through scientific conservational knowledge exchange, material aid, and funding. Moreover, exploration of diplomatic action often focuses on cultural heritage that Western heritage experts or an international heritage organisation, chiefly the United Nations Educational, Scientific and Cultural Organization (UNESCO), considers as forgotten, neglected, damaged, or threatened, and therefore in need of an international conservationist collaboration. This perspective of cultural heritage stewardship includes studies of heritage diplomacy through the prevention of illegal practices such as looting, illicit trade, or trafficking of cultural heritage goods (e.g. Luke 2012b; Winter 2016, 2017; Hafstein 2018), as well as through tackling military or terrorist destruction of heritage sites in conflict zones (e.g. Schwartz 2018).

Scholars commonly approach heritage diplomacy as a loose conceptual framework defined by states' and diplomats' actions in bilateral or multilateral projects dealing with cultural heritage, or state cooperation in international heritage governance. This understanding of heritage diplomacy is aptly described by Clarke (2018)

There are several common ways in which heritage diplomacy takes place: in the high-level negotiations between state parties with regards to conservation decisions such as United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage listing; in donations of funding and expertise proffered by one or more external actors to a strategically valuable state; and even in the exchange of artefacts and exhibitions as a means of promoting bilateral bonds or mending damaged relationships.

Although the scholars in our data typically connect heritage diplomacy to state-led or state-initiated high-level collaboration and the work of official networks and international organisations dealing with heritage – thus 'intrinsically connected with a country's foreign policy' (Winter 2015, 14–15) – several of them, including Clarke (2018), identify non-state actors as planners and implementors of heritage diplomatic projects. These actors include non-governmental organisations (NGOs), networks of local stakeholders, and individual experts, such as archaeologists working at heritage sites (e.g. Luke and Kersel 2012; Luke 2012a, 2012b; McClelland 2020). Through these actors, heritage diplomacy can be considered as including people-to-people diplomatic relationships, which scholars rarely scrutinise. Such research could broaden the current understanding of heritage diplomacy (Tal 2017, 3).

Our analysis shows how the conceptual understanding of heritage diplomacy developed and underlines the influence of a few pivotal scholars. In our data, heritage diplomacy is commonly defined by referring to Winter's notion of it as modes of commemorating and communicating the past to shape international relations (Winter 2015, 14–15). These definitions mention his seminal theorisation of two core approaches: 'heritage *in* diplomacy' and 'heritage *as* diplomacy'. The difference is in whether heritage is or is not shared between the parties in heritage diplomacy. By the first approach (heritage *in* diplomacy), Winter refers to heritage-related initiatives and projects that are coordinated as part of diplomatic actions that do not depend on the notion of mutual or shared heritage as a mediator of relations, but rather 'highlight the various ways in which heritage figures into existing diplomatic ties and policy structure built around trade, the bonds of colonialism, conflict or other strategic alliances' (Winter 2015, 1009). The 'heritage *as* diplomacy' approach draws on fostering shared heritage and building connectivity by identifying shared pasts. Winter (2015, 1011) notes how, today, former colonial powers discursively shape a certain material culture as heritage shared by the former coloniser and colonised to create historical and cultural connections between them and give their contemporary international relations more diplomatic weight and historical validity. He recognises the legacy of unequal power relations included in the concept but sees that it simultaneously helps to 'move beyond the commonly used frameworks of the colonial and postcolonial' (Winter 2015, 998).

Winter's conceptualisation is developed further in some studies in our data. For instance, Vandesande discusses how both heritage *in* diplomacy and heritage-driven diplomacy (drawing from Winter's heritage *as* diplomacy) are based on three modes of addressing heritage. Her conceptualisation draws on the location and origin of both the heritage and the actor who is using it for diplomacy. She calls the first mode 'heritage on location' that refers to 'heritage in a specific country being investigated, promoted or supported by international stakeholders' (Vandesande 2019, 72). The second mode, 'heritage "own-origin"' refers to how 'heritage of a country or a smaller entity is presented outside the country's borders' usually by the actors from that country or entity, and the last mode, 'shared pasts' is based on 'a notion of mutually shared transnational pasts' between countries or smaller entities (Vandesande 2019, 73–74). This conceptualisation reflects common understandings of heritage diplomacy in our data emphasising international heritage governance (first mode); states' international cultural relations or even nation-branding that is often seen characterising the goals of cultural diplomacy (second mode); and Winter's notion of heritage *as* diplomacy (third mode).

Huang and Lee (2019) use Winter's work as their point of departure for developing the notion of 'difficult heritage diplomacy' and 'heritage *off* diplomacy'. They note how 'in a region where geopolitics remains difficult, difficult heritage may even become heritage *off* diplomacy when other diplomatic challenges arise' (Huang and Lee 2019, 143). This may occur when the parties

involved in heritage diplomacy 'have different views of how to reassemble and reformulate difficult memories to ensure balance is maintained in the multi-lateral relations that extend beyond the collaboration' (Huang and Lee 2019, 147). In this conceptualisation, cultural heritage not only enables diplomacy but may suppress it. In such cases, diplomatic attempts may become 'integral to the making of heritage' (Huang and Lee 2019, 154): challenges in heritage diplomacy may rearticulate meanings of cultural heritage and bring about new heritagisation processes.

In our data, scholars rarely explored the scale in heritage diplomatic actions and the creation of symbolic value for cultural heritage. Chalcraft takes scale and sociological value as a basis for developing a new typology, drawing from tensions between 'charismatic heritage diplomacy' and 'careful heritage diplomacy' (Chalcraft 2021, 2). The first type of heritage diplomacy focuses on endangered, internationally recognised, and highly symbolic heritage sites that offer international donors' diplomatic visibility and opportunities for image-building as concerned actors and supporters of 'universal' values of heritage. The second type of heritage diplomacy is less spectacular and focuses on high-risk projects, often dealing with communities and their intangible cultural heritage to 'open up the past and make it work for communities traumatised by conflict' (Chalcraft 2021, 2).

Chalcraft's is one of few studies in our data that recognise the potential of intangible cultural heritage for heritage diplomacy. One other study discusses 'digital heritage diplomacy' but simply defines it as focusing on 'the role and potential of heritage within digital diplomacy strategies' (Clarke 2016, 52). Clarke emphasises the need for a deeper analysis in this emerging field and calls for heritage professionals to increase their efforts to push it up national digitalisation agendas. Recently, the digitalisation of heritage as a diplomatic practice has been explored within the context of museums and as museum diplomacy. Besides its potentials regarding access to cultural heritage and communicating it easily to diverse audiences, this research has identified challenges stemming from power hierarchies and imperialistic and colonial legacies similar to those in 'analogue' heritage diplomacy (Grincheva 2020).

Contexts of conceptual development

In this section, we explore how the idea of heritage diplomacy has developed in scholarship and reflects the broader conceptual contexts of (international) cultural relations. The emergence of heritage diplomacy as a policy and practice is connected to the beginning of international heritage governance, which was based on the experience of tangible cultural heritage being destroyed and museums and collections looted during international conflicts in the twentieth century. As part of a broader move towards internationalism in politics after the Second World War, the international community was established as custodian of cultural heritage, reflecting the growing awareness that a multilateral approach to heritage protection was needed that went beyond traditional approaches and means of diplomacy (Geering 2020; Gaudenzi and Swenson 2018; Winter 2017; Swenson 2016). Central institutional networks were established as new actors in international cultural relations, including UNESCO, the International Council of Museums (ICOM), the International Union for the Conservation of Nature (IUCN), the International Centre for the Study of the Conservation and Restoration of Cultural Property (ICCROM), and the International Council on Monuments and Sites (ICOMOS). This move resulted in the first international treaty focusing on cultural heritage, the Convention on the Protection of Cultural Property in the Event of Armed Conflict in 1954.

With the establishment of the international community as warden, cultural heritage has become an international phenomenon of shared concern and is no longer exclusively an element of nation-building. Huang and Lee (2019, 146) describe this development by noting how UNESCO's World Heritage List is 'a set of processes by which the state paradoxically makes heritage into national and international objects at the same time'. Heritage regulations within the framework of the international community have come to function as a tool to discipline and regulate states that fail to adhere to international conventions of heritage governance. Such governance has raised the moral

responsibility of the signatory states to conserve and protect World Heritage sites and national heritage on their territories, as well as to assist heritage conservation management of endangered cultural and natural property outside their borders (Geering 2020; Hølleland, Hamman, and Phelps 2018). Reflecting this context of international heritage governance, various endeavours in heritage diplomacy are commonly underpinned by a universalistic discourse on science, culture, and education as a basis of building intercultural understanding and peace between peoples and countries (Riviera 2015; Winter 2016, 2019; see also UNESCO 1972, Art 1.1).

The emphasis on the transnational, or even universal, character of cultural heritage as belonging to all humanity has contributed to establishing the idea of heritage conservation and management as a basis for international actions enhancing international relations of mutual trust. This emphasis has also helped to legitimise cooperation with non-state actors through institutionalised frameworks (Winter 2015; Tal 2017; Clarke 2018; Hølleland, Evan, and Phelps 2018): participants in heritage diplomacy now range from governmental actors (e.g. states, foreign ministries, diplomats, and policymakers) to non-governmental ones (e.g. international and national NGOs, cultural organisations, civil interest groups, museums, heritage practitioners, heritage communities, and cities). Digital strategies enable even broader participation in heritage diplomacy, which broadens the notion of international cultural relations (Clarke 2016). The deepening entanglement of official, unofficial, governmental, and non-governmental actors in a 'network of networks' (Winter 2015, 1006) challenges previous understandings of diplomacy as an exclusive domain of states (see also Tal 2017, 3).

Some of the recent studies on heritage diplomacy highlight the role of the international heritage community for shaping discussions on cultural heritage, cultural rights, and justice, such as debates on the ownership of heritage items and their repatriation and restitution in colonial contexts. These studies point out that as a result of the inclusion of non-governmental actors in international heritage projects, the heritage diplomacy agenda has become increasingly linked to the promotion of (Western) values of democracy, human rights, diversity, and civil society. This connects cultural heritage with a wide range of topical global issues, including tourism, sustainability, environmental crises, climate change, migration, inclusion, citizenship, and international security. As a result, the rights-based approach to heritage practices and ownership of heritage has increased and attempts to create dialogue through heritage have been strengthened (e.g. Winter 2015, 2017; Gaudenzi and Swenson 2018; Larsen and Buckley 2018; Schwartz 2018; Jang, Lee, and Kang 2020; Kirchmair 2020).

All these developments move heritage diplomacy further away from the common conceptualisation of cultural diplomacy. Indeed, the studies in our data commonly emphasise the difference between heritage and cultural diplomacy. Winter (2015, 1007) notes, for instance, how in the latter 'relations are couched in self-promoting one-sided actions of a soft power nature' while 'heritage diplomacy is closer to a relational perspective of cultural flows and exchanges'. In the studies, heritage diplomacy is still often seen as the use of 'soft power', drawing on the theory on different forms of power politics between states in global competition (Nye 2004, 2008, 2011) but incorporating forms of 'hard power' (Winter 2015, 11; McClelland 2020, 381). Luke (2012a, 2012b) identifies heritage diplomacy as reflecting 'smart power' (Nye 2008) based on a strategic mixture of soft and hard tools in appropriate context (see also Winter 2015; Clarke 2018).

Instead of simply exporting or projecting one culture as part of a state's soft power and branding strategies, in our data, scholars emphasise building long-term heritage diplomatic relations between states and people through establishing partnership and cooperation drawing on historical cultural interconnections (e.g. Winter 2015, 2016; Clarke 2018). In some of the recent studies in our data, this understanding of heritage diplomacy even moves towards the idea of intercultural encounters. Kersel and Luke (2015, 70, 79, 87) note how heritage diplomacy may function as a 'contact zone between people' enabling 'sources of knowledge and catalysts for new relationships – both within and between communities' and as an 'open and honest dialogue' where 'productive and lasting relationships emerge' (see also Chalcraft 2021). Andersen, Clopot, and Ifversen (2020, 3) take

a similar approach by emphasising the people-to-people dimension in 'colonial heritage diplomacy' as reflecting 'a more expansive interpretation of what heritage [is], which goes hand in hand with a more expansive interpretation of who can act as agents of heritage diplomacy'. In their view, heritage diplomacy may facilitate intercultural dialogue based on the negotiation of common values and accounting for the past.

Heritage diplomacy, power, and geoculture

Our exploration reveals power as key factor in heritage diplomacy. Scholarly interest in power refers to both its use in international relations and attempts to deconstruct or reorganise existing power hierarchies. Next, we explore the power relations embedded in the conceptualisations of and approaches to heritage diplomacy. In our data, most authors are interested in power politics in the international political economy, states' foreign policy, and international relations (Winter 2014, 2015) including emerging political and economic powers, such as China and India, who are attempting to make their mark on the global map. The much-studied Chinese Silk Road Diplomacy is a typical example of such a scholarly focus on power politics (e.g. Pradhan 2017, 2019; Sevilla 2017; Winter 2019, 2020a, 2020b, 2021; Xie, Zhu, and Grydehøj 2020). The interest in power characterises several studies exploring diplomacy in the policy and decision-making processes within UNESCO's World Heritage Committee. These studies (Luke 2016; Peycam 2016; see also Meskell 2018) stress how the Committee's work is intertwined with power struggles and negotiations between state actors.

Diplomatic endeavours may include the use of structural power. Some scholars have noted how practices and policies of cultural diplomacy may echo (cultural) imperialism and power relations stemming from colonialism (Reeves 2007; Nisbett 2013). Some of the texts in our data focus on global structural power, to describe how Western dominance and its imperialistic and colonial legacies still define various heritage diplomatic projects, for instance, through their 'West knows best' stance (Meskell 2015, 8). These researchers have explored the unintentional creation of a 'neo-colonial' or 'neo-imperial' environment in UNESCO's transnational conservation and preservation projects stemming from the power exerted by Western experts and their scientific values at non-Western heritage sites (Kersel and Luke 2015). In these critical studies, heritage diplomacy includes exploration on 'how nations struggle internally to understand their own pasts and the ways in which that specific historical experience continues to condition attitudes and actions' (Yapp 2019, 68).

Many studies in our data criticise the international heritage community as a norm entrepreneur that establishes an international 'authorized heritage discourse' (Smith 2006) founded on Western values through its guidelines and conventions as well as on the heritage diplomacy activities of former colonial powers (e.g. Hafstein 2018; Larsen and Buckley 2018; Schwartz 2018; Huang and Lee 2019; Winter 2019; see also Meskell 2015). Several authors show how the international heritage community includes a power asymmetry based on a small number of primarily Western states that implement international heritage governance by transferring institutionalised approaches to other regions of the world at the expense of local conservation and management practices and decision-making (see Kersel and Luke 2015; Meskell 2015; Akagawa 2016; Clarke 2016; Carruthers 2016; Peycam 2016; Sevilla 2017; Andersen, Clopot, and Ifversen 2020). These studies point out how power imbalance continues to influence today's international relations between the Global North and Global South, or the West and the East (e.g. Luke and Kersel 2012; Kersel and Luke 2015; Meskell 2015; Carruthers 2016; Peycam 2016; Hafstein 2018; Winter 2019; Andersen, Clopot, and Ifversen 2020). However, Beaumont (2016, 363–364), who studied Australian extra-territorial heritage sites in Papua New Guinea, argues that successful bilateral heritage diplomacy can be based on an imbalanced, asymmetrical, and even neo-colonial power relationship between countries, provided that the relations are positioned in terms of mutual gain and self-interest for all involved countries (see also Winter 2015, 998, 2019).

Heritage diplomacy ideally 'relies for its legitimacy on an appearance of openness to dialogue, an avoidance of nationalist sentiments, and a sense of distance from the immediate political priorities' of the government (Clarke and Duber 2020, 63). Several scholars in our data (e.g. Winter 2016, 2020a, 2020b, 2021; Tal 2017; Pradhan 2019; Geering 2020), however, point out that heritage diplomacy or international cultural relations more broadly are controversial as they often disguise national policy objectives and strategies that are labelled as a 'byproduct of the trust, understanding, and relationship developed through cultural relations' (Riviera 2015, 11). These studies draw critical attention to how heritage diplomacy may reflect strategic national objectives in international relations, which makes it difficult to clearly distinguish between domestic and international policy goals. Indeed, the emphasis on the international heritage community's stewardship often conceals geopolitical complexities underlying international funding and engagement in cultural heritage (see Luke 2012a, 2012b; Luke and Kersel 2012; Winter 2014, 2016, 2017, 2019; Kersel and Luke 2015). For instance, many international heritage projects during the Cold War era were embedded in the strategic social, political, and economic objectives of competing political ideologies and geopolitical blocs (Winter 2014, 2017, 2019; Carruthers 2016; Tal 2017; Hafstein 2018; Pomian 2019; Geering 2020). More recent examples of international heritage cooperation in response to the destruction of World Heritage sites in the Middle East and Africa (e.g. the Bamiyan Buddhas in Afghanistan and the cultural heritage sites of Timbuktu in Mali, Nimrud and Niniveh in Iraq, and Palmyra in Syria) are also closely linked to international and national security concerns about combatting extremism and preventing the illegal trade in cultural goods as an important source of income for terrorist groups (Hafstein 2018; Schwartz 2018; Kirchmair 2020).

Our data reveal how states mobilise heritage discourses to advance their strategic political priorities in both their domestic and international relations (e.g. Winter 2014, 2015, 2016, 2020a, 2020b; Kersel and Luke 2015; Meskell 2015; James 2016; Hølleland Hamman, and Phelps 2018). In both contexts, heritage discourses commonly emphasise a mutual past or historical connectivity as a basis either for nation-building or building trust and international relations in the countries' foreign policies (see Calligaro 2014; Winter 2014, 2015). Scholars in our data critically note that not every case of historical cultural contact is evidence of a 'shared' heritage (Swenson 2016; Winter 2019; Andersen, Clopot, and Ifversen 2020). References to a 'shared', 'common', or 'mutual' heritage often have power to depoliticise international relations (Yapp 2016, 74) by associating histories of connectivity and cultural entanglement with positive ideals and values, such as peace, exchange, friendship, dialogue, and trust (Winter 2021, 701). While an emphasis on shared heritage in international relations helps to question prevalent national interpretations of the past by offering a transnational perspective on entangled historical processes and events, it can be used to secure influence in strategically important regions, both within countries and in relations with other countries.

Even though heritage diplomacy typically has an international dimension, its goals may still draw from domestic geostrategic interests, such as the governance of cultural minorities or the fostering of cultural nationalism (e.g. Akagawa 2014, 2016; Winter 2014, 2020a, 2020b; Yapp 2016; Pradhan 2017, 2019; Svensson and Maags 2018; Huang and Lee 2019; Winter 2019, 2020b, 2021; Xie, Zhu, and Grydehøj 2020). The domestic and international dimensions may even collide. Clarke (2017) discusses Australia's attempt to create a list of extra-territorial heritage sites situated overseas that highlights its 'global past', revealing that the instrumentalisation of heritage for domestic and nationalistic reasons may create tensions in international relations. Also, Clarke and Duber (2020) point out that successful domestic strategies are not necessarily successful in foreign relations, as manifested in the case of Poland's attempts to govern the meanings of war heritage at the Museum of the Second World War in Gdańsk. Moreover, many of the heritage diplomatic projects between former colonising and colonised countries stem from domestic geostrategic interests. Heritage diplomacy in such contexts may include geopolitical power imbalances that obscure (colonial) legacies connected to experiences of shame, trauma,

violence (e.g. Gaudenzi and Swenson 2017; Garnsey 2019; Jang, Lee, and Kang 2020; Andersen, Clopot, and Ifversen 2020), or unresolved geopolitical conflicts (Huang and Lee 2019; Jang, Lee, and Kang 2020; Pradhan 2019; Winter 2019).

China's heritage diplomacy in the framework of the Belt and Road Initiative (BRI) is considered as a successful recent example of intertwining international and domestic interests. Under the leadership of Xi Jinping, the BRI was launched in 2013 as part of a new grand strategy to make China an economic superpower. China's new focus on economic expansion changed its diplomatic strategy in international relations, incorporating different uses of soft power to secure and improve its international status (see Winter 2019). The BRI is a highly controversial initiative. The international community, with the USA, EU, India, and Australia leading the way, criticise the BRI for encouraging corruption, failing to meet international standards, and leveraging a form of debt-trap diplomacy for geopolitical ends (see Ohashi 2018). A number of scholarly works, including Winter's pre-eminent analyses of heritage diplomacy, focus on China's BRI model in global political and economic governance, which necessitates a more extensive discussion of it here.

Winter's recent works (2017, 2019, 2020b, 2021) reveal the strategic value that China attaches to its attempts to revive the Silk Road narrative to 'win friends and build loyalties, and to legitimise expansionist ambitions to public audiences, both at home and abroad' (Winter 2019, 18). He shows how China has taken the Silk Road narrative forward, reinterpreting the past to expand its significance in international affairs, while framing its foreign policy ambitions within a language of peaceful connectivity and harmonious dialogue (Winter 2019). Winter addresses China's Silk Road diplomacy with the concept of geoculture, which he understands as a strategic exercise of geopolitical power (Winter 2019, 2020a, 2021). Within this exercise, the selective mobilisation of culture and history are being used to promote a new level of cultural cooperation and people-to-people contacts in international relations (see also Huang and Lee 2019; Khazanov 2019). Geoculture critically points towards the ways in which fragmented and disconnected strategies find coherence in a grand narrative that not only serves international relations and domestic governance, but also makes the distinction between them, and between hard and soft power, irrelevant in heritage diplomacy. For Winter (2019), geoculture combines a spatial and cultural reach beyond the territorial and temporal confines of a nation state; it scrutinises new forms of knowledge, power, and ways of recreating history. His conceptualisation of geoculture is important for broadening the understanding and use of heritage diplomacy in international relations beyond perspectives of cultural heritage stewardship.

Some scholars in our data discuss how Chinese Silk Road Diplomacy can serve to both counterbalance Western influence in international heritage governance and impel states to expand their vision of common cultural and political values and priorities around the notion of interconnected pasts (Sevilla 2017; Svensson and Maags 2018; Xie, Zhu, and Grydehøj 2020). Other scholars critically highlight how this narrative helps China to legitimise its current geopolitical claims and to strengthen its geopolitical and economic power in a vast area from East Asia to South-East Asia, West Asia, Middle East, Europe, and East Africa, indeed on the global stage (see also Pradhan 2017, 2019; Winter 2020a, 2020b, 2021; Xie, Zhu, and Grydehøj 2020). Cultural heritage connects to geocultural power aspirations in the context of the European Union's international relations with strategically important regions and countries. While scholars of this connection point out the use of similar narratives of historical connectivity, shared cultural heritage, and common values, and refer to the EU's alleged historical competence in creating intercultural dialogue, these researchers often discuss these attempts in terms of cultural diplomacy (e.g. see Isar 2010; Vos 2017; Clarke 2018; Lähdesmäki, Kaasik-Krogerus, and Mäkinen 2019; Lähdesmäki et al. 2020; Scott 2019; Molho 2020; Carta and Higgott 2020; Čeginskas and Kaasik-Krogerus forthcoming).

Conclusions

Scholars have long explored the role of cultural heritage in international cultural relations. Scholarly discussion on heritage diplomacy as such is more recent. This discussion has emerged and developed during the past decade – particularly inspired by Winter's seminal studies. The increased scholarly interest in the potential of cultural heritage for diplomacy can be connected to the paradigm shift – the emergence of a novel critical view in heritage scholarship – towards understanding heritage as proactive. Critical heritage researchers have become more interested in power, the uses of cultural heritage for diverse political purposes, and how fostering something as heritage can 'do' things. Moreover, the scholarly interest in heritage diplomacy reflects the recent emphasis on the social dimension of cultural heritage, such as its potential for bringing about community building, social participation, and dialogue.

Our exploration of the sampled publications revealed seven main ways in which scholars conceptualise and define heritage diplomacy. To a certain extent, these different approaches build on each other and overlap in scholarly works. First, these conceptualisations commonly deal with heritage-related actions in states' international relations and foreign policy, as well as cooperation within international heritage governance, particularly in the framework of UNESCO. In this context, heritage diplomacy is also understood as acts of enhancing peace, stability, and trust in conflict zones through international collaboration. Second, scholars often approach heritage diplomacy as influenced by and being part of states' domestic policy goals and governance. This conceptualisation challenges the idea of heritage diplomacy as 'soft power' (Nye 2004) that aims at impacting 'outsiders' and the conditions 'outside' one's own borders. Rather, it suggests new ways to think about heritage diplomacy, as in the case of Winter's recently developed concept of geoculture. This concept represents a third way to conceptualise heritage diplomacy in our data. It emphasises culture more broadly as a constant parameter of intertwined international and domestic power relations that blurs rigid distinctions between internal and external objectives, policies, and practices in states' international relations. Winter's impact on scholarship is particularly evident also in his conceptualisation of 'shared heritage' as a basis for heritage diplomacy. This concept represents a fourth avenue for understanding heritage diplomacy as an attempt to build international relations by identifying shared values and interpretations of the past. The idea of shared heritage and historical connectivity guides scholars to explore heritage diplomacy in two more, overlapping contexts: one within a (de)colonial framework emphasising heritage-related actions to dismantle historical and ongoing power asymmetry through repatriation and restitution and the other taking a rights-based approach to heritage practices and ownership of cultural heritage. These two conceptualisations of heritage diplomacy represent a fifth and a sixth approach, respectively, in our data. Both approaches underpin heritage as a challenging political and diplomatic tool in international relations that goes beyond its use for strengthening cohesion and inclusion by emphasising its ability to create exclusion, division, and hierarchical power relations between people. Finally, and as the seventh mode of conceptualisation, heritage diplomacy is also perceived more broadly as providing contact zones for intercultural dialogue within and between diverse communities and cultural groups.

Most of the studies in our data were written by scholars with a background in history, (archaeological) anthropology, or built heritage, who explore the management of historical monuments, buildings, artefacts, or archaeological sites through diverse programmes and initiatives of conservation, restoration, research, funding, transfer of scientific and technical expertise, building of institutional structures, or cultural exchange. This scholarship sharpens the focus on tangible cultural heritage in heritage diplomacy. Only in the past few years, scholars have started to explore the full potential of cultural heritage by considering intangible aspects, such as value discourses and the relevance of narratives in building international cultural relations. Our data, however, lack studies focusing exclusively on intangible cultural heritage in the field of heritage diplomacy.

Even though heritage diplomacy is a relatively new concept in scholarship, many of its core elements have been previously discussed within the frameworks of cultural diplomacy, public diplomacy, new diplomacy, soft power, or the internationalisation of politics that emphasise the interconnection of cultural heritage with power and geopolitics. However, scholars usually distinguish between these previous frameworks and heritage diplomacy. Our analysis shows that heritage diplomacy provides a useful conceptual framing to interdisciplinary research on the manifold ways in which heritage and history are deployed in the building, negotiation, and struggle over geopolitical power. Thus, the concept of heritage diplomacy can effectively capture current global issues drawing on power asymmetry, such as the use of cultural heritage in the intertwined political, social, and cultural movements seeking to counter inequality, colonial legacy, and racism, and to enhance the pursuit of justice and (cultural) rights.

Our research underlines that cultural heritage and power relations are entangled in the conceptualisations and explorations of heritage diplomacy. A critical approach to this entanglement encourages us in line with earlier research to rethink cultural heritage through a transnational perspective that highlights the historical connectivity and mobility of people, objects, and ideas, as well as the uses of power included in narratives dealing with such connectivity. Moreover, it encourages us to rethink who the actors in heritage diplomacy are – who wields the power? We suggest approaching heritage diplomacy as way to recognise and deconstruct power hierarchies between heritage communities by understanding cultural heritage as a contact zone of people-to-people connectivity, reciprocal cooperation, and mutual trust. Both governmental and non-governmental actors can appropriate and use cultural heritage to become contact zones that enable intercultural encounters. Meaningful encounter requires dialogue that incorporates a sensitivity towards difference (Constantinou 2013), empathy (Lähdesmäki and Koistinen 2021), an appreciation of different types of knowledge (Clopot, Andersen, and Oldfield 2022), and active listening (Di Martino 2020) – 'an ethical approach to listening, based on a genuine interest in the other's perspective and placing listening as an outcome in and of itself' (Clopot, Andersen, and Oldfield 2022, 275; see also Di Martino 2020). A dialogic understanding of heritage diplomacy is not restricted to harmonious relations, but includes controversies and dissonance. Indeed, heritage dissonance can strengthen dialogue by enabling people to open up and use the dissonance to 'do' more inclusive heritage (Čeginskas and Kaasik-Krogerus forthcoming; see Mäkinen 2019). This contact-zone approach enables scholars to perceive cultural heritage as a proactive site of connectivity linked to multiple global issues and challenges. This will advance the interdisciplinary research of heritage practices and processes within societies and communities, in their intertwined relations internally and with the wider world.

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CULTURAL HERITAGE

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Cultural heritage preservation efforts in Malaysia: A survey

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Abstract. Malaysia, just like its neighbouring countries in the region, has a rich and diverse culture and heritage treasures. What makes Malaysia more unique is its diversity as a multi-racial and multi-cultural country. These cultural heritages might become lost and extinct without any efforts in preserving and safeguarding due to modernization, assimilation, and globalization. We present an overview of different cultural heritage in Malaysia and available efforts to preserve these treasures found from literature. Digital preservation efforts that computer graphics, media scientists and practitioners could offer as alternatives in preservation of culture and heritage preservation will also be included in this paper.

1. Introduction

The need for cultural heritage preservation is certainly pressing, due to many factors such as development, modernization, climate change and assimilation. Due to its necessity, the United Nations Educational, Scientific and Cultural Organization (UNESCO) has established working committees and manuals to ensure that cultural heritage around the world receives proper attention and protection.

The context of cultural heritage relates to culture, heritage and cultural heritage. Culture has a broad meaning, but for clarification we refer to UNESCO's definition as the "complex whole that includes knowledge, beliefs, arts, morals, laws, customs and any other capabilities and habits" within a society. The World Heritage Convention in 1972 acknowledges that 'monuments, groups of buildings and sites' as heritage. However, as time progresses, interaction with humanity also has influence with the environment thus making the whole environment can be regarded as heritage.

There are different categories of heritage based on UNESCO's definition: cultural heritage, natural heritage and heritage in the event of armed conflict. We will outline different types of heritage in Malaysia in the next section, followed by efforts in cultural heritage preservation that were found in the literature. Highlight on the role of computer graphics technology in cultural heritage preservation will be presented before we conclude this paper.

2. Available Cultural Heritage in Malaysia

We will follow closely the categories outlined by UNESCO and the National Heritage Department, Ministry of Tourism and Culture Malaysia on various types of heritage available locally. Cultural heritage is diverse;

it is further divided into tangible and intangible cultural heritage. Tangible cultural heritage generally includes all things that can be observed such as things (movable – such as coins and paintings, and unmovable – such as sites and monuments) both on dry land and underwater. Intangible cultural heritage deals with a more subjective aspect such as tradition, dances and rituals. We listed some of the examples of cultural, natural and heritage in the event of armed conflict below – divided into those recognized in the UNESCO World Heritage list (Table 1):

Table 1. UNESCO World Heritage.

Category	World heritage in Malaysia
Natural Heritage Sites	a. Gunung Mulu National Park, Sarawak b. Kinabalu National Park, Sabah
Cultural Heritage Sites	a. Melaka and George Town, Historic Cities of Straits of Malacca b. Archaeological Heritage of the Lenggong Valley, Perak
Memory of the World	a.Correspondence of the late Sultan of Kedah (18 1943) b. Sejarah Melayu (The Malay Annals) c. Hikayat Hang Tuah d. Batu Bersurat Terengganu (Inscribed Stone Terengganu)
Global Geopark	Langkawi UNESCO Global Geopark, Kedah
Intangible Cultural Heritage of Humanity	Mak Yong theatre

At the national level, the National Heritage Act 2005 (Act 645) was tabled and endorsed in order to ensure conservation and preservation of the National Heritage; including sites, tangible and intangible cultural heritage, underwater cultural heritage, artefacts and related items. Some of the examples of natural heritage items (apart from those recognized by UNESCO) are:

- Sites (building): St Paul's ruin, Melaka, Carcosa Seri Negara, Sultan Abdul Samad (Supreme Court), Tugu Negara (the National Monument)
- Sites (archealogy): Gua Badak Archeological Site (Cave Drawing), Teluk Kelawar Cave
- Sites (natural): Taman Negara (National Forest - Peninsular Malaysia), Timbalai Triangulation Station
- Objects: Perak Man, Tengkolok Diraja (Royal headgear), Perahu Kemajuan (boat)
- Intangible (dances/performances) : Zapin, Gamelan, Wayang Kulit
- Intangible (traditional games): Wau, Gasing, Congkak
- Intangible (local delicacies): Nasi Lemak, Nasi Tumpang, Nasi Dagang, Laksa Johor

Note however, that the full list can be found on from National Heritage Department's website [1]. The National Heritage Department is the main body governing the regulations and enforcement of the National Heritage Act, besides conducting activities and seminars to create and strengthens awareness in the local community.

3. Efforts in Preservation of Cultural Heritage in Malaysia
Based on survey of the literatures, we present efforts done by various researchers related to cultural heritage preservation in Malaysia:

Malaysia is a member of ASEMUS (Asia-Europe Museum Network); which is a museum network collaboration targeting the use and sharing of objects in museum collection. As part of ASEMUS, there is a section called Virtual Collection of Asian Masterpieces (VCM) with the purpose of sharing museum collections across Asian and European museums. Visitors can search shared museum collections to view images and browse information related to the viewed object [2]. Malaysia participates with the virtual Islamic Arts Museum Malaysia, complete with some of the virtual exhibits as shown as Figure 1.
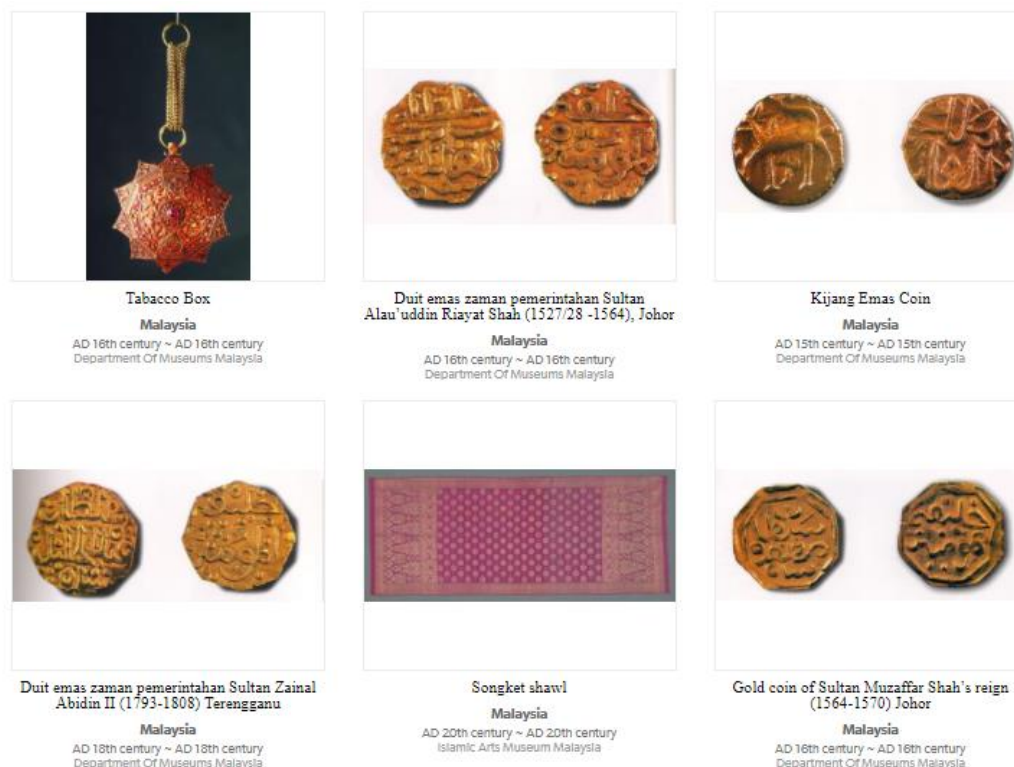
Figure 1. Some of the VCM exhibits from Malaysia [2].

Survey among local people and site observation related to identity of the historic sites (e.g. case study on Kuala Dungun and Taiping) [3] was conducted and another one on Malaysian public's perception on heritage buildings conservation [4]. There are also studies on issues in conservation and redevelopment in areas surrounding historic areas[5], on heritage building conservation (with pilot study)[6], formulation of best maintenance practice guidelines[7], sustainable best practice criteria[8] for Malaysian heritage building conservation, the challenges in conservation practices in Malaysia[9], and the use of Geographic Information System (GIS) technology as digital archive to manage heritage buildings and monuments in Melaka[10]. Similarly, proper asset management on virtual model of the sheltered pavilion of Pak Badol, which has been relocated to the Kelantan Museum of Royal Traditions and Customs for conservation [11] was proposed.

A virtual reconstruction of iconic heritage buildings [12], digital preservation of Malay architectural heritage (Rumah Tok Su – a traditional Malay house in Kedah) [13], recreating the 3D model of traditional Malay house (Teratak Zaaba) [14], virtual preservation of panoramic Kota Kuala Kedah[15] and 3D preservation of the A Famosa Fortress in Melaka[16] are among efforts done in using computer graphics and media technology in preservation of cultural heritage. Apart from that, a study on the potentials and

challenges in digitising facial expressions for preservation of a Malay folkdance called Mak Yong [17] was carried out recently.

Studies on performance and establishment measurements on the Geopark concept based on the indicator proposed by Global Geopark Network (GGN)[18] and into the practices of responsible tourism in the Kinabalu Park (UNESCO National Park)[19] were done related to natural heritage sites. The willingness of the tourism to pay the preservation works was also studied and creating value for sustainable tourism in the heritage site [20]. An improved technique for Land Use/Land Cover (LULC) map was proposed for the purposes of environmental monitoring and natural resources management purpose towards conservation of UNESCO Global Geopark - the Kilim Karst Geoforest Park (KKGP) in Langkawi [21].

Among those related to intangible cultural heritage are a study on the visual styles of the Wayang Kulit Kelantan and its capturing methods [22], design and development of interactive virtual Wayang Kulit [23], preservation of Wayang Kulit using multimedia technology[24] into an interactive game[25] and emulating the visuals of Wayang Kulit with Computer Generated Imaginary[26]. Other than that, studies on the determinants of food heritage through food identity [27] and based on age of public perceptions [28] were also done to preserve local food heritage and identity.

Computer game is also used as an indirect way to preserve cultural heritage and create interest and awareness among public. Example of this approach are interactive Wayang Kulit[25], a virtual heritage game called M-Heritage Hunt based on surroundings of George Town, Penang in Malaysia[29], presentation of the history of A Famosa using Game Based Learning methodology[30] and digital Congkak[31]. An AR application was developed to expose users on the masks of the Orang Asli Malaysia (part of the exhibition in the The Museum of Asian Art) as a fun, learning tool [32].

4. Computer Graphics and Media Research for Preservation of Cultural Heritage

We will discuss this topic mainly because our team consists of computer graphics and digital media researchers. Based on previous discussion, there are quite a number of research utilizing computer graphics and multimedia tools and approaches as outlined in the previous sections. It was stated that the first use of graphical representation in archaeology was in the late 1950s [33] using vector-based display. Computer graphics and multimedia technology has progressed to the state of being able to offer digital representation of world cultural heritage. However, it would be costly to set up an online world heritage site; for example, results from a committee appointed by the European Commission estimated 100 billion Euros cost for digitizing European cultural heritage [34].

Computer graphics and multimedia technologies have been used widely in documenting cultural heritage, especially the ones that fall under tangible heritage category. It can be used for the purpose of documentation, reconstruction, visualization, gamification and training towards cultural preservation and awareness. Research onto utilizing computer graphics and media technology into intangible cultural heritage is emerging rapidly.

Based on literature review of cultural heritage preservation in Malaysia, previous efforts were mostly channeled towards preservation of tangible heritage. Digital reconstruction of heritage site/building as a form of tangible heritage preservation is more distinct compared to digital preservation of intangible cultural heritage (ICH). Due to the diversity and subjectivity of ICH, digital preservation of ICH faces enormous technical challenges.

We took up the challenge of venturing into digital preservation of ICH especially for local context. Over the years, there are various research and development projects carried out by our research members that are related to traditional games such as natural interaction using Leap Motion for marble game[35] and Congkak[36] – these are some of the research examples combining affordable hardware (Leap Motion) to cater natural user interaction that incorporate ICH-related contents. Some of the scenes captured from the 3D experience are included as Figure 2 and 3.

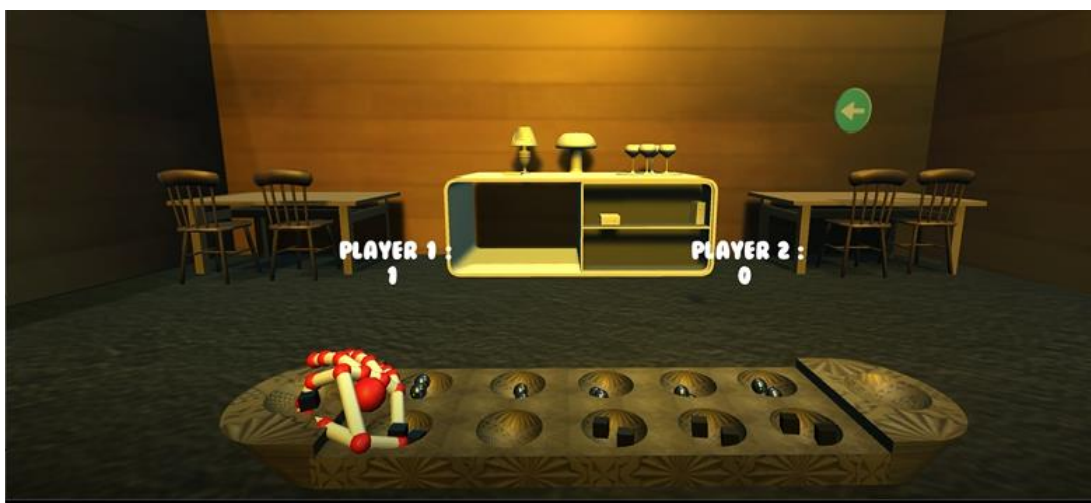**Figure 2.** Scenes from Marble Game[35].

Figure 3. 3D Congkak[36] incorporating natural user interactions.

An enhancement of virtual reconstruction of historical sites involving the use of augmented reality (AR) technology was done for ancient Malacca [37] – an early settlement in the Straits of Malacca. The use of AR in preservation efforts requires more research such as in object recognition/detection and design of interactions, apart from integration with the 3D environment.

   We also work closely with Johor Heritage Foundation in exploring the possibility of using current technology in digital heritage preservation. Based on initial collaboration, we managed to get the involvements of UTM ViCubeLab researchers, undergraduate and postgraduate students to work together with the Johor Heritage Foundation. Experts in traditional dance took part in a series of motion capture data sessions (using marker (Figure 4) and markerless multi-camera systems (Figure 5)) and video recording (Figure 6) to get reliable Zapin dance data for further use.

   The captured Zapin dance data were used in various research, for example a study on suitable algorithms to generate a more natural facial expressions for motion capture data re-use in 3D animation[38], to propose a method of extracting the 3D dance motion data of Zapin traditional dance from video data using keyframe animation extraction method[39] and a framework for constructing a 3D motion and skeleton using a monocular video source (2D video) targeted for traditional dance motion data extraction[40].
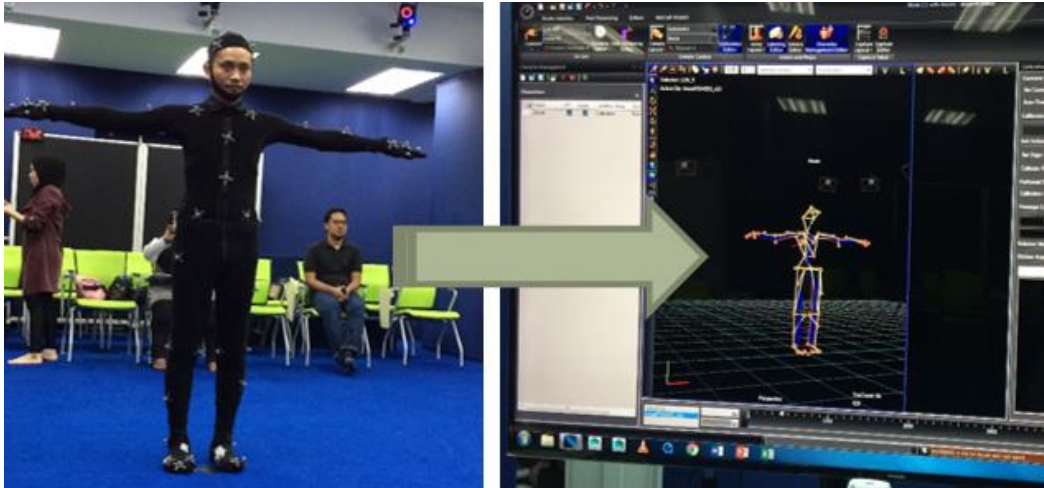
Figure 4. Expert involvement in a marker-based motion capture session.
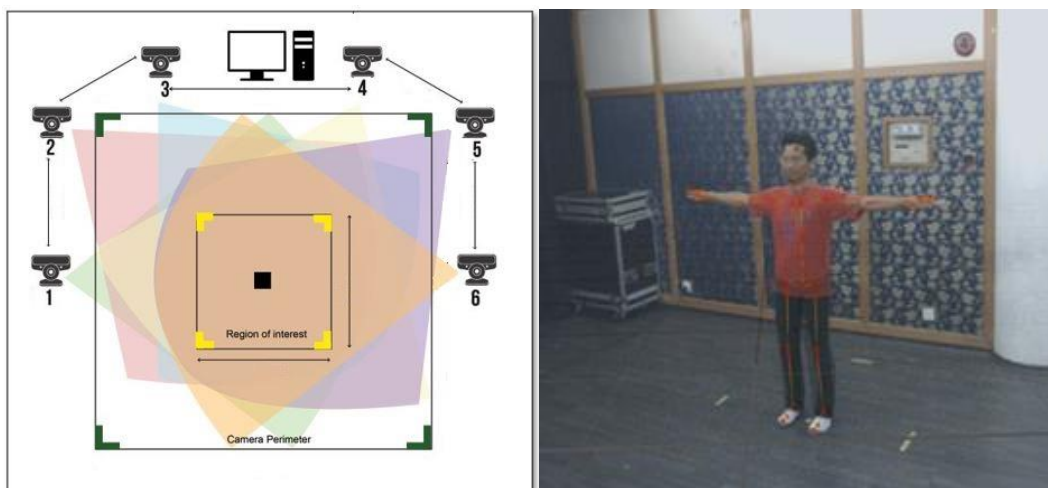
Figure 5. Camera setup (left) and expert involvement in markerless motion capture sessions.

Figure 6. Expert involvement (left) in video recording sessions.

On the lighter side, we managed to integrate heritage elements into our final year projects. Some of the examples are the study of fabrics and motives used for dance costumes as shown in Figure 7 (this was based on the visit to textile gallery at Johor Heritage Foundation) along with motion capture data re-use for animation [41], photogrammetry for artifacts reconstruction [42] and virtual museum on handheld device [43].
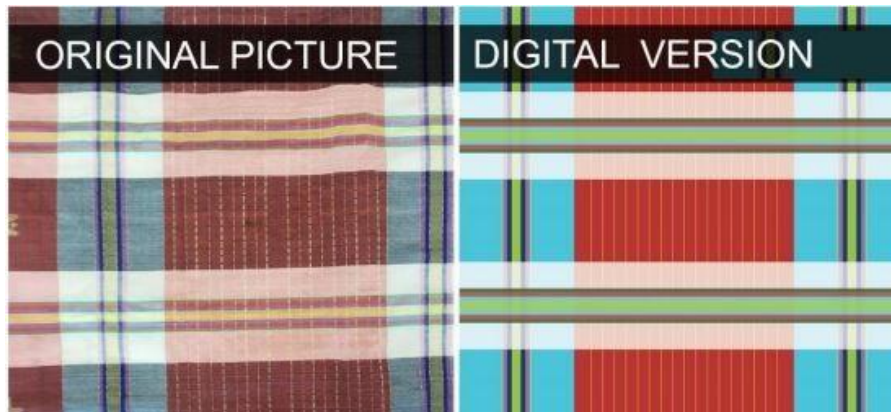
Figure 7. Original motive on textile (left) and the digital adaptation (right) [41].

5. Conclusion and Future Work

As a conclusion, we have seen the diverse cultural heritage available in Malaysia. Based on what were found from the literature, most of the preservation efforts (including usage of computer graphics and media) reported were mostly centered around tangible cultural heritage. Since computer graphics and media technology has so much to offer, there are endless possibilities for cultural preservation efforts digitally both for tangible and intangible cultural heritage preservation. Our team is currently working with Southeast Asian and European partners towards intangible cultural heritage preservation using computer graphics and computational science methods.

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ARTICLES FOR FACULTY MEMBERS

CULTURAL HERITAGE

Title/Author	Geological, biological, cultural and local wisdom heritage a key element of mersing geopark development / Said, M. Z., Komoo, I., Mohamad, E. T., Ali, C. A., Ahmad, N., Wahid, M. E. A., & Rajimin, M. F.
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Warisan geologi, biologi, budaya dan kearifan tempatan tunjang pembangunan Mersing Geopark

(Geological, biological, cultural and local wisdom heritage a key element of Mersing Geopark development)

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Abstrak: Daerah Mersing memiliki banyak warisan geologi bernilai kebangsaan dan antarabangsa berusia dari 350 juta tahun lampau. Kepelbagaian biologi yang tinggi dan keunikan budaya tempatan melengkapkan geowarisan kawasan tersebut. Justeru, Jawatankuasa Geopark Kebangsaan telah memilih Mersing sebagai sebuah wilayah untuk dibangunkan sebuah geopark. Usaha pembangunan Mersing Geopark telah dimulakan pada 2017 melalui sebuah Jawatankuasa Saintifik dan Pembangunan Mersing Geopark. Keseluruhan daerah Mersing iaitu 6,371 kilometer persegi termasuk kawasan laut sehingga ke Kepulauan Aur telah dikenal pasti sebagai sebuah geopark. Geowarisan di sini telah dikenal pasti sebanyak 22 buah geotapak yang merangkumi kawasan daratan dan pulau. Flora dan fauna yang penting juga telah dikenal pasti berada di dalam kawasan perlindungan. Tradisi kehidupan, seni dan budaya yang unik dan masih terpelihara menambah lagi nilai geopark ini. Beberapa unsur utama telah diperkenalkan bagi menyediakan Mersing Geopark sebelum dinilai sebagai calon geopark kebangsaan pada Disember 2018 iaitu governans geopark – pengurusan berasaskan mekanisme 'pengurusan bersama', pemuliharaan alam – komuniti, ekonomi masyarakat melalui aktiviti geopelancongan, dan pendidikan awam. Banyak program dan aktiviti telah dijalankan bagi menghadapi rancangan masa depan untuk Mersing menjadi UNESCO Global Geopark. Geopark memartabatkan sumber warisan tabii dan budaya melalui pembangunan secara bersepadu, pembangunan geopelancongan untuk meningkatkan pendapatan, pemeliharaan tapak warisan serta memperkasa komuniti setempat bagi mempupuk semangat kesepunyaan kepada tempat mereka.

Kata kunci: Geotapak, biotapak, geopelancongan, komuniti setempat, kelestarian

Abstract: The district of Mersing is bestowed with many national and international geological heritage sites dated since 350 million years ago. The high biodiversity and uniqueness of the local culture complements the geoheritage of the area. Thus, the National Geopark Committee has chosen Mersing as a territory to be developed as a geopark. Mersing Geopark development efforts were initiated in 2017 through the Mersing Geopark Scientific and Development Committee. The entire Mersing district of 6,371 square kilometers, including the marine areas right up to the Aur Archipelago is identified as the geopark area. The geoheritage here has been identified as 22 geosites, which cover land and island areas. Important flora and fauna have also been identified as being within the protected areas. The unique and preserved traditions of life, art and culture add to the value of this geopark. Several key elements were introduced to prepare Mersing Geopark before being evaluated as a national geopark candidate in December 2018, namely governance of the geopark - management based on 'co-management' mechanism, nature conservation – community, community economy through geotourism activities, and public education. Many programmes and activities have been carried out to face future plans for Mersing to become a UNESCO Global Geopark. Geopark enhances natural and cultural heritage resources through integrated development, geotourism development to increase income, preservation of heritage sites and empowerment of local communities to foster a strong sense of pride and belonging to a place.

Keywords: Geosite, biosite, geotourism, local community, sustainability

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PENGENALAN

Mersing adalah sebuah daerah terletak di timur Johor mempunyai cirian warisan geologi, biologi, budaya dan kearifan tempatan yang istimewa. Sejarah geologinya bermula semenjak zaman Karbon, berkait rapat dengan evolusi tektonik dan geologi kawasan Asia Tenggara (Pentas Sunda) dan Selatan China (Metcalfe, 2017; JKSPMG, 2018). Bukti tinggalan sejarah evolusi geologi tersebut masih banyak tersingkap di daerah Mersing. Oleh kerana Mersing adalah sebuah wilayah yang memiliki warisan geologi bernilai kebangsaan dan rantau maka, wilayah ini adalah sesuai untuk dibangunkan sebagai sebuah geopark.

Selaras dengan cadangan daripada Jawatankuasa Geopark Kebangsaan pada tahun 2016 untuk mewujudkan sebuah geopark di setiap negeri maka, daerah Mersing telah dipilih untuk pembangunan geopark bagi negeri Johor. Wilayah geopark ditakrifkan sebagai sebuah kawasan yang mempunyai tapak dan landskap geologi bernilai antarabangsa, diurus secara holistik dengan mengambilkira kepentingan memelihara warisan tabii, pendidikan awam dan pembangunan lestari sumber tabii tanpa musnah (Zouros, 2016; Komoo & Patzak, 2018; Komoo, 2019; UNESCO, 2020; UNESCO, 2020a). Tidak semua wilayah boleh mewujudkan geopark, kecuali wilayah itu mempunyai geotapak bernilai warisan tinggi dan mempunyai perancangan pemuliharaan yang baik (UNESCO, 2020). Geopark juga memberikan tumpuan kepada kepentingan membangun ekonomi komuniti setempat melalui produk pelancongan baharu berasaskan pengetahuan mengenai warisan dan keindahan landskap. Setiap geopark mempunyai keunikan tersendiri, boleh menjadi kebanggaan komuniti setempat dan daya tarikan pelancong. Geopark menyimpan cebisan sejarah penting perkembangan bumi, mempunyai ekosistem dan habitat biologi menarik, dan mempamerkan hubungan erat antara manusia dan alam (Zouros, 2016). Daerah Mersing mempunyai nilai warisan yang tinggi, terutamanya daripada aspek kepelbagaian geologi dan biologi serta tradisi komuniti nelayan. Banyak lagi sumber warisan tabii di Mersing masih belum diterokai sepenuhnya untuk faedah industri geopelancongan dan pembangunan sosioekonomi komuniti setempat. Mersing pada masa kini adalah pintu masuk utama ke Pulau Tioman. Melalui pembangunan sebagai sebuah geopark, Mersing boleh meningkatkan industri pelancongannya yang tersendiri.

PEMBANGUNAN MERSING GEOPARK

Mersing Geopark terletak di bahagian timur laut negeri Johor merangkumi keseluruhan daerah Mersing. Luas kawasan daratan termasuk pulau-pulau ialah 2,836.08 kilometer persegi, manakala keluasan keseluruhan Mersing Geopark meliputi laut adalah seluas 6,371 kilometer persegi. Berdasarkan kepada Rajah 1, kedudukan Mersing Geopark adalah bersempadan dengan negeri Pahang di utara, Pulau Tioman di timur, Daerah Kota Tinggi di selatan dan Daerah Kluang dan Segamat di bahagian barat.

Usaha pembangunan Mersing Geopark bermula pada tahun 2017 dengan pembentukan sebuah jawatankuasa protem iaitu Jawatankuasa Saintifik dan Pembangunan Mersing Geopark (JKSPMG). Melalui JKSPMG, kerjasama membangunkan Mersing Geopark telah dimulakan antara Pusat Geokejuruteraan Tropika (GEOTROPIK), Universiti Teknologi Malaysia (UTM); Pusat Penyelidikan Langkawi (PPL), Institut Alam Sekitar dan Pembangunan (LESTARI), Universiti Kebangsaan Malaysia (UKM) dan Jabatan Mineral dan Geosains (JMG) Johor (Komoo, 2019).

Rajah 1: Sempadan Mersing Geopark.

Persediaan ke arah membangun sebuah geopark mengutamakan kajian mengenai pembangunan geotapak seperti menjalankan kerja lapangan mengenal pasti dan memeta tapak-tapak warisan penting (geotapak, biotapak dan tapak budaya), membentangkan kertas cadangan kepada kerajaan Negeri Johor, menyediakan dokumen pencalonan (dossier), menghasilkan panel maklumat dan melaksanakan aktiviti promosi kepada seluruh pihak berkepentingan dan penduduk Mersing seperti penganjuran seminar, taklimat, pameran sehinggalah menguruskan misi penilaian Mersing Geopark (JKSPM, 2018; Komoo, 2019).

Mersing amat sesuai sebagai sebuah geopark kebangsaan kerana daerah ini mempamerkan keunikan dan keistimewaan tersendiri dari aspek warisan geologi, biologi, budaya dan kearifan tempatan. Geopark boleh memartabatkan sumber warisan tabii dan budaya melalui pembangunan secara bersepadu, pembangunan geopelancongan, pemeliharaan tapak warisan dan memperkasakan komuniti setempat (Komoo *et al.*, 2019). Tiga faktor utama yang menjadi tunjang pemerkasaan Mersing Geopark adalah sumber warisan geologi, warisan biologi, warisan budaya dan kearifan tempatan. Dengan memupuk semangat kesepunyaan dalam kalangan masyarakat setempat, secara tidak langsung memelihara dan memulihara warisan tabii serta meraikan dan mengharmonikan aktiviti pelancongan berinovatif di Mersing Geopark.

Warisan geologi Mersing

Evolusi geologi Mersing boleh dibahagikan kepada beberapa fasa utama. Bukti lapangan berdasarkan singkapan batuan di sekitarnya menunjukkan evolusi bermula dengan fasa pemendapan sedimen di sekitaran laut dalam pada masa Karbon yang membentuk jujukan batuan Formasi Mersing (Cook & Suntharalingam, 1969; Foo, 1983; Hutchison, 1989; Suntharalingam, 1991; Bucher & Frey, 1994; Metcalfe, 1999; Metcalfe, 2000; Leman *at al.*, 2003; Surjono & Leman, 2010). Pertembungan antara kepingan Malaya Timur dengan kepingan Sibumasu yang bermula semenjak akhir Karbon telah mengangkat dasar lautan menjadi daratan pertama pada masa Perm Awal. Ini terbukti dengan pembentukan batuan enapan daratan Konglomerat Murau yang tersingkap di Tanjung Murau (Jantan *et al.*, 1988; Suntharalingam, 1991; Surjono *et al.*, 2003; Surjono, 2007). Proses subduksi yang berterusan yang menyusupkan kerak lautan dari bahagian barat ke bawah kepingan Malaya Timur telah menyemarakkan aktiviti volkano disepanjang arka yang bermula di Johor Selatan hingga ke utara. Aktiviti volkano ini telah meninggalkan satu jaluran batuan volkano dari Pengerang berterusan disepanjang pesisir timur negeri Johor membentuk pantai berbatu dan rantaian pulau berbatuan volkano yang berpemandangan indah (JKSPMG, 2018; Komoo, 2019; Komoo *et al.*, 2019). Fasa berikutnya melibatkan perejahan batuan granit jenis-I yang banyak tertabur di pulau dan juga pedalaman Mersing (Bignell & Snelling, 1977; Searle *et al.*, 2012). Proses tersebut telah

mengangkat keseluruhan kawasan menjadi daratan, diikuti oleh proses luluhawa dan hakisan yang menghasilkan endapan daratan di dalam lembangan daratan yang terpencil dan terpisah-pisah membentuk jujukan batuan enapan daratan Formasi Tebak, Panti dan yang lain-lain berusia Jura hingga Kapur. Proses tersebut juga telah mengukir landskap daratan yang terlihat pada hari ini (Metcalfe, 1999; Metcalfe, 2000; Surjono *et al.*, 2006; Metcalfe, 2017; JKSPMG, 2018; Komoo *et al.*, 2019). Keseluruhan bukti-bukti lapangan yang menyokong evolusi geologi dalam jangka masa yang panjang tersebut adalah warisan geologi bernilai tinggi yang perlu dipelihara dengan baik untuk kita memahami sejarah tanah air yang menjadi kebanggaan semua komunitinya.

Pemendapan sedimen Formasi Mersing

Sejarah geologi Mersing bermula dengan proses pemendapan batuan tertua yang diwakili oleh batuan Formasi Mersing (Cook & Suntharalingam, 1969; Suntharalingam, 1991; Leman *et al.*, 2003), membentuk batuan dan dimendapan di dalam sekitaran lautan yang berubah daripada turbidit laut dalam (Hutchison, 1989) di bahagian bawah hingga cetek (Foo, 1983) di bahagian atas (Surjono & Leman, 2010) membentuk lapisan bersaiz nipis sehingga sangat tebal (berlumpur, berlodak, berpasir dan sedikit konglomerat). Peristiwa canggaan (canggaan tektonik tempatan) dan metamorfisme rantau yang berlaku akibat penimbusan yang dalam (5 hingga 20 kilometer) dan rejarah granit yang membekalkan suhu yang tinggi (200 hingga 600 sentigred dengan tekanan 2 hingga 6 bar) ini ditafsirkan berlaku pada masa Paleozoik Atas telah menukar batuan tersebut menjadi filit, kuarzit dan meta-konglomerat hingga mencapai gred syis. Proses ini mengambil masa di antara 10 hingga 50 juta tahun (Bucher & Frey, 1994) dengan struktur canggaan yang sangat rencam dan telah mengangkat blok timur semenanjung terutama di bahagian Johor Timur yang ditafsirkan berlaku pada zaman Karbon Akhir disebabkan subdukan kepingan *Paleo-Tethys* dibawah Plat Indochina (Metcalfe, 1999; Metcalfe, 2000; Surjono & Leman, 2010).

Daratan Murau dan pemendapan batuan sedimen tertua

Proses pengangkatan blok Malaya Timur-Indochina telah menghasilkan satu jujukan batuan sedimen daratan yang tertua dan menindih Formasi Mersing secara tidak selaras dari Tanjung Sekakap ke Tanjung Murau, Tanjung Tiang Berusong, Pulau Batu Chawang dan Tanjung Tenggaroh (Suntharalingam, 1991). Unit batuan ini dikenali sebagai Konglomerat Murau atau Formasi Murau (Jantan *et al.*, 1988). Litologinya terdiri daripada breksia batu kelikir dan batu pasir yang membentuk jujukan tebal bersaiz rudit yang diendapkan di dalam sistem kipas delta (Surjono *et al.*, 2003). Pemendapan sedimen yang membentuk formasi batuan ini telah berlaku sebelum aktiviti gunung berapi dan unit batuan ini ditafsirkan berusia pra-lewat Perm Awal atau berkemungkinan berusia Karbon Lewat (Surjono, 2007).

Aktiviti letusan volkano

Pada zaman Perm Awal hingga Perm Tengah telah wujud satu rantai gunung berapi lautan di timur Johor membentuk satu jalur arka yang menganjur pada arah tenggara-baratlaut. Pada masa berlaku aktiviti volkano yang meluas di blok Malaya Timur-Indochina, kawasan di Johor Timur dan Mersing juga telah berlaku letusan gunung berapi yang ganas dengan luahan debu piroklas serta bom yang pelbagai saiz. Batuan piroklas ini terdiri daripada tuf terkimpal, aglomerat, serta breksia volkano. Sebahagian daripada bahannya adalah aliran lava basa atau bes seperti andesit dan ignimbrit serta aliran lava riolit. Bahan sedimen gunung berapi dan aliran lava membentuk beberapa unit batuan volkano di Johor Timur dari Pengerang hingga ke Penyabong. Di Mersing, unit batuan volkano ini dikenali batuan Volkano Jasin bersempena singkapan batuan ini yang terbaik terletak di Sungai Jasin, Taman Negara Endau-Rompin (JKSPMG, 2018; Komoo, 2019; Komoo et al., 2019).

Rejahan granit

Pada masa Perm Akhir hingga Trias Tengah telah berlaku fasa rejahan magma ke dalam batuan yang ada di Blok Malaya Timur-Indochina iaitu di Jalur Timur Semenanjung Malaysia. Penyejukan magma yang berlaku di dalam kerak benua yang lebih sejuk telah menghasilkan batuan igneus pertengahan hingga asid membentuk jalur pluton Johor yang merupakan sebahagian daripada jalur pluton Timur Semenanjung Malaysia. Singkapan batuan igneus yang paling ke timur wujud di Pulau Aur terdiri daripada diorit, granodiorit, granit dan dolorit yang mengisi rekahan membentuk korok yang besar dan sangat panjang. Perejahan kedua ini berlaku di zaman Kapur sekitar 100 juta tahun lampau (Bignell & Snelling, 1977; Searle et al., 2012).

Pemendapan sedimen daratan

Selepas berlakunya perejahan granit secara besar-besaran di zaman Trias, bumi Mersing dan keseluruhan semenanjung Malaysia telah terangkat menjadi daratan sepenuhnya susulan daripada Orogeni Cimmerian akibat daripada penutupan lautan Tethys. Proses luluhawa dan hakisan terhadap pergunungan yang baru terbentuk ini telah menghasilkan banyak bahan sedimen yang termendap membentuk enapan halus dan sungai berburai di bahagian kaki pergunungan. Mendapan sedimen ini membentuk satu jujukan sedimen iaitu Formasi Tebak yang membentuk Gunung Janing dan Gunung Keriong di dalam Taman Negara Endau-Rompin hari ini. Jujukan batuan yang berusia Jura-Kapur ini termendap secara tidak selaras di atas batuan Volkano Jasin. Unit batuan sedimen daratan yang setara juga ditemui terletak di atas batuan granit terluluhawa di kawasan berdekatan. Litologinya terdiri daripada batu pasir bersih bersaiz sederhana berstruktur lapisan silang dan kesan riak arus. Kelengangan tektonik selepas zaman tersebut menyebakan lapisan batuan ini tidak terlipat dan mempunyai kemiringan sangat landai yang kurang daripada 10 darjah.

Bahagian atas jujukan batuan ini membentuk morfologi penara dan mesa yang berpandangan indah (Metcalfe, 2017; JKSPMG, 2018; Komoo et al., 2019).

Denudasi dan pemendapan sedimen aluvium muda

Proses denudasi yang berlaku secara berterusan memendapkan lebih banyak puing hasil luluhawa dan hakisan terhadap batuan telah mengisi semua bahagian lembah dan pamah rendah sehingga membentuk dataran aluvium kuaterner asalan daratan. Sebahagian daripada sedimen tersebut dibawa dari laut dan dimendapkan membentuk dataran pantai dan dataran dampar (Metcalfe, 1999; Metcalfe, 2000; Surjono et al., 2006; Metcalfe, 2017; JKSPMG, 2018).

Evolusi landskap daratan

Proses luluhawa dan hakisan yang berlaku semasa fasa denudasi mengukir bentuk rupa bumi menjadi morfologi dan landskap yang ada pada hari ini. Di bahagian daratan, bukit yang dibentuk oleh batuan yang berkomposisi seragam telah diukir membentuk morfologi perbukitan rendah yang bermofologi membulat dan beralun. Sementara batuan meta sedimen dan batuan sedimen membentuk bukit dengan puncak yang tidak seragam akibat pengaruh kewujudan satah retakan dan satah perlapisan serta struktur lipatan di dalamnya. Batuan sedimen muda berusia Jura-Kapur pula membentuk penara berpuncak rata berkemiringan landai. Di bahagian pesisir dan lepas pantai pula banyak tersingkap batuan Formasi Mersing, batuan volkano dan sedikit granit yang berketahanan tinggi terhadap hakisan membentuk tanjung batu, tunggul laut, tebing jurang dan pulau baki. Hakisan laut terhadap satah lemah yang terdedah pula menghasilkan banyak gua laut dan gerbang laut (Mohd Fauzi et al., 2013; JKSPMG, 2018; Isfarita et al., 2018).

Evolusi landskap kepulauan

Kepulauan Seribuat mempunyai 62 pulau-pulau, termasuk Pulau Tioman, Pulau Acheh, Pulau Sembilang, dan Pulau Seribuat. Namun demikian, keempat-empat pulau tersebut tidak termasuk di dalam sempadan Mersing Geopark. Pulau yang berpenduduk ialah Pulau Pemanggil, Pulau Tinggi, Pulau Aur dan Pulau Sibu (Zakaria et al., 2008; Mohd Fauzi et al., 2013; JKSPMG, 2018).

Geotapak Mersing Geopark

Proses geologi yang berlaku sejak 350 juta tahun lampau hingga hari ini telah meninggalkan bukti sebagai sandaran serta boleh dikaji dengan lebih lanjut. Bagi pembangunan Mersing Geopark, bukti proses geologi tersebut dikelaskan mengikut usia dan proses dari tua hingga muda sebagai tapak warisan geologi bagi Mersing Geopark seperti senarai di Jadual 1. Sementara, Rajah 2 pula menunjukkan taburan bagi geotapak, biotapak dan tapak budaya Mersing Geopark. Antara contoh geotapak utama di Mersing Geopark adalah seperti Rajah 3 dan 4.

Rajah 2: Peta Mersing Geopark dan taburan geotapak, biotapak dan tapak budaya.

Jadual 1: Senarai dan penjelasan 22 tapak warisan geologi Mersing Geopark.

Bil	Evolusi Geologi	Nama Geotapak
1	Evolusi Geologi Sedimen	Konglomerat Tanjung Leman
2		Konglomerat Tanjung Murau
3		Konglomerat Berklas Mega Batu Chawang
4		Batu Pasir Gunung Janing
5	Evolusi Geologi Volkanik	Volkano Tanjung Penyabong
6		Volkano Pulau Sibu
7		Tuff Terkimpal Tanjung Arong
8		Breksia Gunung Berapi Pantai Air Papan
9		Riolit Pulau Tinggi
10	Evolusi Geologi Pluton	Granit Pulau Besar
11		Granit Jemaluang
12		Dolerit Pulau Hujong
13		Granit Pulau Aur
14		Diorit Pulau Pemanggil
15	Evolusi Tektonik	Canggaan Berganda Teluk Bangka
16		Formasi Mersing Tanjung Kempit
17		Permatang Kuarza Gunung Arong
18	Evolusi Landskap	Pulau Baki Batu Gajah
19		Pulau Baki Harimau
20		Pulau Baki Gual
21		Dataran Pasang Surut Pulau Mawar
22		Air Terjun Upeh Guling

Rajah 3: Contoh geotapak utama di Mersing Geopark. Geotapak Konglomerat Tanjung Leman.

Rajah 4: Contoh geotapak utama di Mersing Geopark. Geotapak Volkano Pulau Sibu.

Rajah 5: Contoh warisan biologi di Mersing Geopark. *Livistona endauensis* di Gunung Janing, Taman Negara Endau-Rompin.

Rajah 6: Contoh warisan biologi di Mersing Geopark. Santuari Dugong di Pulau Sibu, Taman Laut Sultan Iskandar.

Warisan biologi

Flora dan fauna yang penting adalah sebahagian daripada komponen warisan tabii di Mersing Geopark. Kawasan perlindungan seperti Taman Negara Endau-Rompin (TNER) adalah penting sebagai komponen pemuliharaan di dalam sesebuah geopark. TNER yang amat kaya dengan kepelbagaian biologi mewakili pelbagai jenis habitat termasuklah hutan tanah rendah campuran dipterokarpa, habitat riparian, hutan paya air tawar, hutan bukit edafik yang didominasi oleh hutan permatang bukit Seraya Sabut (*Shorea curtisii*) dan hutan palma *Livistona* (Rajah 5), hutan bukit dipterokarpa dan hutan sub-gunung. Banyak spesies flora endemik di sini seperti *Begonia rajah, Dacryodes kingii, Ridleyandra kiewii, Kostermansia malayana, Macropanax maingayi,* dan *Piptospatha ridleyi* (Dowe, 2002; Chooi, 2005; Wong *et al*., 2005). Taman Negara Endau-Rompin adalah salah satu daripada tiga kawasan pemuliharaan di Mersing Geopark (Komoo *et al*., 2019).

Keistimewaan Mersing sebagai geopark juga disumbangkan oleh Taman Laut Sultan Iskandar (TLSI). TLSI juga adalah kawasan pemuliharaan di Mersing Geopark yang terdiri daripada 13 pulau dalam enam kepulauan, iaitu Pulau Tinggi, Pulau Aur, Pulau Pemanggil, Pulau Besar, Pulau Sibu dan Pulau Rawa (Komoo *et al*., 2019). TLSI diurus di bawah Akta Perikanan 1985 dan Enakmen Perbadanan Taman Negara Johor 1989. Taman laut ini juga telah diwartakan sebagai Taman Marin pada tahun 1994 (Aikanathan & Wong, 1994). Perairannya mengandungi kepelbagaian spesies flora yang tinggi dan spesies haiwan yang endemik dan langka seperti di Pulau Tinggi (MIMA, 2006), Pulau Sibu (Bujang *et al*., 2006), Pulau Besar (Bujang, 1994; Boss *et al*., 1999; Idris *et al*., 2002; Lee *et al*., 2010; Hana Badriah *et al*., 2010) dan Pulau Aur (Wong, 1989; Turner *et al*., 1998; Zulfigar *et al*., 2007). Kepelbagaian spesies hidupan marin di kebanyakan pulau-pulau di Mersing adalah antara yang tertinggi (Ahmad *et al*., 2007; Wood Jr. *et al*., 2008; Grismer, 2011; Awang *et al*., 2017). Salah satunya adalah dugong di Pulau Sibu seperti Rajah 6.

Warisan budaya dan kearifan tempatan

Mersing sangat kaya dengan kepelbagian warisan sejarah, budaya dan kearifan tempatan. Perkembangan warisan ini sangat jelas dicirikan oleh interaksi penduduk asal yang mempunyai hubungan rapat dengan ekosistem persekitarannya (JKSPMG, 2018). Kepelbagaian warisan yang wujud ini meliputi perkampungan tradisi nelayan seperti di Kampung Mersing Kanan, Bahagia, Sri Lumpur, Penyabong, Semanyir, Teluk Lipat, Belukar Juling, Sri Pantai, Makam, Tenglu Laut dan Air Papan. Majoriti penduduk di Mersing adalah Melayu Mersing serta Melayu yang berhijrah dari Pantai Timur Semenanjung Malaysia iaitu dari Kelantan dan Terengganu yang bekerja sebagai nelayan di Mersing. Terdapat juga komuniti tradisi pribumi iaitu Orang Asli dari suku kaum Jakun. Kebanyakan mereka menetap di Kampung Peta di Taman Negara Endau-Rompin, masih meneruskan tradisi memburu hidupan liar dan bergantung hidup kepada sumber tabii hutan (Jusoh & Ahmad, 2010; Samsudin *et al.*, 2010; Samsudin *et al.*, 2014). Rajah 7 menunjukkan permainan Kercang Orang Asli Jakun.

Rajah 8 menunjukan seni warisan yang masih lagi di pelihara di Mersing Geopark iaitu tarian Zapin Pulau di Kampung Bahagia. Keunikan tarian ini adalah kerana liuk gerak penari yang lebih keras yang melambangkan kehidupan mereka sebagai pelaut dan nelayan melangkah tegas di atas permukaan perahu (JKSPMG, 2018). Antara warisan tidak ketara lain yang terdapat di Mersing Geopark adalah produk dan hasil marin, seni tarian Zapin Pulau dan Tenglu, Seni Buah Pukul Mersing dan Lagenda Sri Mersing. Selain itu, perairan Mersing juga merupakan laluan penting kapal belayar, pengembara dan para pedagang (Coedes, 1975). Pulau-pulau yang terdapat di Mersing menjadi kawasan perlindungan dari angin dan ombak (Samsudin *et al.*, 2010). Secara tidak langsung menjadikan Mersing sebagai kawasan percampuran dan pertembungan budaya.

Rajah 7: Keunikan budaya di Mersing Geopark. Permainan Kercang oleh Orang Asli Jakun.

Rajah 8: Keunikan budaya di Mersing Geopark. Tarian Zapin Pulau di Kampung Bahagia.

POTENSI GEOPELANCONGAN BAHARU BERINOVATIF

Pembangunan Mersing Geopark sebagai geopark kebangsaan akan memberi manfaat kepada lebih 83,300 orang penduduk Mersing, merangkumi 151 buah kampung di 10 buah mukim (Abd. Rahman, 2019). Walaupun secara tradisinya, kegiatan ekonomi di daerah ini dijana oleh sektor pertanian melibatkan rancangan Lembaga Kemajuan Tanah Persekutuan (FELDA), Lembaga Penyatuan dan Pemulihan Tanah Persekutuan (FELCRA) dan Pihak Berkuasa Kemajuan Pekebun Kecil Perusahaan Getah (RISDA) serta perikanan (perkampungan dan kehidupan nelayan), kini, teras ekonomi baharu Mersing adalah ke arah sektor berasaskan pelancongan (Abd. Rahman, 2019; Amir Hamzah, 2019; Komoo, 2019; Komoo *et al.*, 2019). Oleh yang demikian, pembangunan Mersing Geopark akan lebih merancakkan lagi pembangunan ekonomi di wilayah ini. Mersing mempunyai banyak daya tarikan yang bersifat alam terutamanya yang berkaitan dengan kepelbagaian geologi, biologi dan keindahan landskap. Pada masa kini, aktiviti pelancongan kurang mendapat sambutan dan kebanyakan pelancong yang datang menjadikan Mersing sebagai tempat persinggahan sebelum ke Pulau Tioman. Wawasan mewujudkan Mersing Geopark berhasrat untuk menggalakkan lebih ramai pelancong tinggal lebih lama di Mersing sambil mengenali dan mempelajari rahsia alam di sini.

Berdasarkan statistik jumlah pelancong dari Majlis Daerah Mersing, jumlah pelancong ke Mersing adalah semakin meningkat sejak 2015 sehingga 2019. Berdasarkan kepada statistik tersebut, pada tahun 2015, jumlah pelancong yang datang ke Mersing adalah seramai 172,087 orang dan telah meningkat kepada 321,120 orang pada tahun 2019 (Majlis Daerah Mersing, 2020). Jumlah pelancong ini memberikan impak yang positif kepada aktiviti pelancongan sedia ada di Mersing. Melalui Mersing Geopark, aktiviti pelancongan baharu iaitu geopelancongan diperkenalkan.

Geopelancongan atau pelancongan ilmu ini melibatkan aktiviti melawat tapak-tapak warisan (geotapak, biotapak, dan tapak budaya) melalui georintis yang disusun bagi melibatkan komuniti setempat. Pembinaan georintis yang berpotensi adalah bertujuan mendedahkan kepada para pelancong tentang keunikan landskap berpandangan indah serta rekod sejarah bumi dan hidupan seperti fosil yang terawet di dalam batuan (Komoo *et al*., 2018). Geopelancongan memberi perhatian kepada penerokaan alam, mempelajari ilmu alam, menghormati alam dan menggalakkan amalan pelancongan lestari serta hubungan terintegrasi antara alam dan manusia (Komoo *et al*., 2018; Komoo, 2019).

Melalui gagasan geopark dapat membantu meningkatkan pendapatan dan memberi peluang pekerjaan baharu kepada komuniti setempat. Antaranya adalah melalui geopelancongan, pakej inapdesa, pelancongan budaya, agro dan gastro pelancongan, produk hasil laut, pembangunan produk geopelancongan dan georintis untuk geopelancongan. Disamping itu, pembangunan geopark akan membantu pembangunan di kawasan tersebut seperti usaha menaik taraf prasarana sedia ada dan pembinaan prasarana baharu yang dirancang dalam geopark khususnya untuk geopendidikan, geopelancongan dan infrastruktur sokongan untuk pelancongan.

KESIMPULAN

Mersing Geopark meraikan sumber warisan tabii dan budaya setempat melalui pembangunan bersepadu melibatkan pelancongan sumber warisan iaitu geopelancongan, pemuliharaan tapak warisan terintegrasi dan pembangunan sosioekonomi untuk kesejahteraan komuniti setempat. Pengiktirafan daerah Mersing sebagai sebuah geopark akan mengangkat nama Mersing dan menarik pelancong yang gemar dengan aktiviti geopelancongan dan ekopelancongan. Pembangunan Mersing Geopark selaras dengan fokus Kerajaan Negeri Johor untuk menjadikan Mersing sebagai sebuah daerah destinasi pelancongan terunggul di rantau ini. Pembangunan ini juga akan meningkatkan ekonomi negeri Johor, amnya dan Mersing, khususnya. Perkembangan geopelancongan akan membuka lebih banyak ruang perniagaan dan peluang pekerjaan kepada komuniti setempat bagi meningkatkan taraf sosioekonomi dan kesejahteraan hidup.

Sebagai sebuah daerah pelancongan, pembangunan prasarana juga akan berkembang pesat dan ini akan lebih memberikan impak kepada pembangunan fizikal daerah Mersing. Dengan konsep geopark, proses pendidikan awam yang ingin memastikan rakyat sentiasa menyayangi persekitaran alam tabii akan tercapai. Bagi memastikan keberkesanannya, pendekatan pengurusan bersama digunakan untuk pemuliharaan warisan terintegrasi dan penggunaan sumber asli tanpa musnah. Pendidikan dan kesedaran awam tentang Mersing Geopark diharapkan dapat memupuk perasaan bangga dalam kalangan penduduk tempatan dan memperkukuhkan identiti mereka dengan

kawasan tersebut serta merangsang sumber pendapatan baharu melalui geopelancongan sambil melindungi sumber geologi, biologi, dan budaya dan kearifan tempatan di wilayah ini (Komoo & Patzak, 2008; Komoo, 2010). Pembangunan ekonomi yang lebih dirasai oleh komuniti setempat di samping membangkitkan semangat cintakan wilayah dan rasa kesepunyaan dapat menjayakan Mersing Geopark dan membuktikan bahawa konsep dan amalan Pembangunan Lestari Wilayah mampu dicapai.

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ARTICLES FOR FACULTY MEMBERS

CULTURAL HERITAGE

Stakes and Challenges for Underwater Cultural Heritage in the Era of Blue Growth and the Role of Spatial Planning: Implications and Prospects in Greece

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Abstract: Underwater cultural heritage (UCH) constitutes an invaluable asset, which is lately being challenged by the blue growth trend that cannot be easily reconciled with the goal of UCH preservation and promotion. Maritime spatial planning (MSP)—under a place-based approach—creates better chances for UCH to receive more attention in the future compared to other resources, since it is considered to be the key procedure for tackling growing competition among sea users (user-user conflicts) and for mitigating the pressure these users put on the marine environment (natural and cultural). In Greece, a country with great insularity, extensive marine space, and a long and glorious past, UCH resources are in abundance. According to the official Ministry of Culture data-base, there are 88 designated UCH sites throughout the national waters, the majority of which are found very close to the shore. They usually concern ancient cities and built monuments that were eventually submerged (due to earthquakes, geological processes, etc.), so they usually have a mixed nature—terrestrial and marine. These sites, however, constitute a very small part of what is actually lying on the Greek seabed. Estimations for the future identify a rise in accidental discoveries of UCH, due to the blue growth trend and an increase in access to and work in the sea. In this event, much controversy is expected, concerning the appropriate type of management for UCH. The role of MSP in this decision-making process will be decisive, being about "when" and "where" human activities take place at sea, to ensure these are as efficient and sustainable as possible.

1. Introduction

According to estimations made by UNESCO, there are millions of wrecks worldwide spanning thousands of years of history, with hundreds of ancient cities now lying beneath water surfaces due to natural phenomena (changing sea levels, earthquakes, etc.) as well as manmade disasters (shifting landmasses, building of dams, etc.), and many geological formations (caves, etc.) that at some point were flooded, hiding prehistoric sites beneath the water surface [1,2]. Such valuable resources, however, are lately being challenged by the blue growth trend and the ever-growing interest in the development of maritime economic activities and infrastructure that may be directed at or indirectly affect underwater cultural heritage (hereinafter, UCH).

So far, existing literature for UCH, which is quite extensive, mainly focuses on issues of maritime archaeology and preservation [1,3]; on jurisdictions and rights as included in the international or regional legal documents [4–7] pertaining to management and promotion [8–10]; or in its correlation with natural and technological hazards and threats [11–13]. On the other hand, literature correlating

UCH with stakes and challenges related to the blue growth trend—which, according to the EU is about supporting sustainable growth in the marine and maritime sectors as a whole—is still very limited. This fact, however, comes as no surprise, if one considers that the EU Integrated Maritime Policy (IMP) was announced in 2007, whilst the EU Maritime Spatial Planning (hereinafter MSP) Directive was launched in 2014.

Given the above, the present paper focuses on UCH resources, especially submarine, which are within the MSP geographical scope. It also highlights the increasing interest in blue growth (and the way it may affect UCH) and the role of MSP in protecting and promoting UCH. Focusing on the case of Greece, the paper aims at contributing to the ongoing discussion regarding the wise management and planning of the marine space (MSP), always taking into consideration the UCH parameter, which is lately being severely challenged by the blue growth trend—a trend that cannot be easily reconciled with the goal of UCH preservation and promotion.

2. About Underwater Cultural Heritage

2.1. Definitions and Terms

According to the UCH Convention of UNESCO (adopted in 2001), "Underwater Cultural Heritage" is defined as: All traces of human existence having a cultural, historical, or archaeological character, which have been partially or totally under water, periodically or continuously, for at least 100 years, such as: (i) Sites, structures, buildings, artefacts, and human remains, together with their archaeological and natural context; (ii) vessels, aircraft, other vehicles, or any part thereof, their cargo or other contents, together with their archaeological and natural context; and (iii) objects of prehistoric character. The convention names a wide range of UCH assets, also introducing a double criterion: (a) Time (giving a 100-year limit) and (b) significance (distinguishing UCH assets as cultural, historical, or archaeological) [5]. The convention excludes from the definition of UCH all types of pipelines and cables, as well as other installations placed on the seabed.

According to the Draft European Convention on underwater cultural heritage (Council of Europe, 1985), UCH resources may be found entirely or in part in seas, lakes, rivers, canals, artificial reservoirs, or other bodies of water; in tidal or other periodically flooded areas; recovered from any such environment; or washed ashore. Therefore, by its nature and definition, "underwater cultural heritage" has a strict geographical scope (cultural assets found within water bodies) and a strong tangible character (it is solely associated with tangible assets and resources). Other terms used instead of UCH by international documents (e.g., the 1954 Hague Convention) and literature are "underwater cultural property" and "submerged objects", due to the emphasis put on the tangible character of UCH and the rights for salvage and rescue of their content [7,14].

2.2. Stakes and Challenges for UCH in the Era of the Blue Growth Trend and the Role of Spatial Planning

Marine space is constantly gaining ground as "home" to a growing number of activities and human uses [15]. Due to improvements in technology, today it is easier than ever to exploit marine resources found at longer distances and greater depths, as well as to construct resilient infrastructure and facilities in seas for the development of several economic activities [16]. As a result, the spectrum of human uses taking place in the sea has grown to include, apart from traditional activities (such as navigation and maritime transport, fisheries, etc.), a series of new ones, such as: Extraction of hydrocarbons and aggregates; energy production; aquaculture; tourism and leisure; research and protection of the marine natural and cultural heritage; military uses; and so on [17].

As recent research indicates, however [18,19], this great—and usually unplanned—development of human uses and infrastructure in the sea (as a result of the blue growth trend) is not only threatening marine natural resources with exhaustion and degradation, but also UCH [17,18,20,21]. To address this challenge, marine/maritime spatial planning (MSP), which is "a public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological,

economic, and social objectives that usually have been specified through a political process" [22] has recently become a high priority globally. In fact, with increasing acknowledgment of the threats that the marine ecosystems are facing, more and more international organizations and bodies (or even sole countries) are turning their interest towards MSP, and especially towards MSP under a place-based approach.

This re-orientation of MSP from a sectorial-based approach (which emphasizes the growth of specific activities each time) to a place-based approach (which aims at organizing all human activities, so that user–user and user–environment conflicts are avoided) is of paramount importance to UCH, which is now receiving growing pressure and threats due to the blue growth taking place in oceans and seas [17,23].

MSP under a place-based approach creates better chances for UCH to receive more attention in terms of protection and management. At the same time, MSP under a place-based approach is considered to be suitable for tackling the growing competition among sea uses (user–user conflicts) and for mitigating the pressure these uses put on the marine environment (natural and cultural) [24,25]. However, even if place-based MSP occurs, the greatest challenge for UCH will be how to reconcile blue growth trends with UCH preservation and promotion: In other words, how should UCH be prioritized, compared to other marine economic activities and resources, when planning for human uses of the sea.

3. Considering the UCH Parameter in MSP

3.1. Maritime Protection Zones and UCH

Protected areas (or protection zones) constitute a special type of zone, specifically addressing management and protection of natural and cultural heritage and assets. At an international level, zoning aimed at UCH protection—a special "cultural heritage protection zone" (The UCH convention on underwater cultural heritage was launched in 2001 to stipulate further provisions for the protection of UCH in areas beyond national jurisdiction. In the initial draft of the convention, a "cultural heritage protection zone" was proposed to assist a key objective of the convention, i.e., "in situ" protection [5]. This zone, however, was soon removed from later versions, for raising controversy with existing zoning provided by UNCLOS. If left, it could have been established by any coastal state party, covering areas beyond its territorial sea and up to the outer limit of the continental self, giving jurisdiction over all kinds of activities affecting UCH [2].)—was first conceptualized during the drafting of the United Nations UCH convention on underwater cultural heritage. Such a concept, though, never reached the final version of the convention. As a result, zoning explicitly addressing the protection of UCH is entirely a national affair. This means that conceptualization and designation of such zones (having as the sole focus protection of UCH resources) can only be undertaken individually by each state, either within its territory, territorial waters (According to UNCLOS (art.3), "Every State has the right to establish the breadth of its territorial sea up to a limit not exceeding 12 nautical miles, measured from baselines determined in accordance with this Convention"), or the contiguous zone (According to UNCLOS (art. 33), the contiguous zone may not extend beyond 24 nautical miles from the baselines from which the breadth of the territorial sea is measured.).

This complete absence of a special zone directly addressing UCH protection beyond the contiguous zone of a coastal state can be remediated by other zoning, having a more general and wider objective and focus, such as marine protected areas (MPAs). MPAs constitute spatially-delimited areas in the marine environment, within which certain human uses and activities are either permitted or not [26]. According to the International Union for the Conservation of Nature (IUCN), MPAs can be designated for a number of reasons, including: Economic resource management; biodiversity conservation; species protection; and the protective management of natural areas to keep them in good environmental and natural condition. UCH, being an integral part of the marine natural ecosystem and landscape, may therefore benefit from the designation of such protection zones [27], especially in

the cases where a cultural asset is located beyond the territorial waters or the contiguous zone of a coastal state (i.e., in areas where coastal states' jurisdictions over UCH do not apply).

The MPAs launched at an international and regional level (by the International Maritime Organization—IMO, UN, EU, etc.) include a range of specific intended purposes. These are described in the following paragraphs.

MARPOL special areas: The MARPOL Convention (International Convention for the Prevention of Pollution from Ships) was adopted in 1973 by the IMO. According to this convention, special areas can be recognized at an international level for technical reasons, or due to their particular character and oceanographical and ecological condition, for the purpose of adopting measures for the prevention of sea pollution by oil. The convention also provides for an "emission control area" designed to prevent, reduce, and control air pollution from NOx or SOx and the adverse impacts on human health and the environment.

Particularly Sensitive Sea Areas **(PSSAs)**: Resolution A.982 (24) of IMO, provides the possibility for the designation of a PSSA, especially in areas fulfilling a set of ecological, social, cultural, and economic criteria (e.g., be a unique or rare ecosystem, be a significant area for education, recreation, or tourism, etc.). The designation of an area as a PSSA requires specific measures for the control of maritime activities in that area, including routing measures, etc. PSSAs can be included in MARPOL special areas and vice versa.

Special Protected Areas (SPAs) and *Sites of Community Importance* (SCIs): SPAs and SCIs, established by the European Union in 1992 (the Habitats Directive 1992/43), constitute the largest network of protected areas in the world. The network includes terrestrial and marine sites, providing protection to valuable and threatened species, and habitats of natural importance.

Specially Protected Areas of Mediterranean Interest **(SPAMIs)**: The SPA/BD Protocol of the Barcelona Convention (UNEP/MAP) provided the possibility for the designation of SPAMIs. This type of protected area is established to promote cooperation in the management and conservation of natural areas, as well as to protect threatened species and their habitats found in the marine space of the Mediterranean. SPAMIs are also designated in marine areas of scientific, aesthetic, historical, archaeological, cultural, or educational interest.

Ecological Protection Zones **(EPZ)**: Such zones are established in the EU and in the Mediterranean with the approval of the IMO. The primary objective is to preserve ecological biodiversity and, in some cases, living resources (such as fishes, etc.).

Given the above options and range of MPAs, selection of the most appropriate type of zone for the protection and management of UCH depends on: a) The distance from shore, i.e., if its location falls within the territorial waters (12 n.m. from the baseline) of a coastal state or within a proclaimed E.E.Z. (200 n.m. from the baseline); and b) the type of valuable resource found in the surrounding area of UCH. This is, of course, in the case that "in situ" protection and management of UCH is chosen.

3.2. Sea-Use Planning in Areas Including UCH: Identifying Synergies and Conflicts

Although the designation of natural and cultural protection zones is of prime importance for UCH, even more significant is the content of the planning implemented within the limits of such zones. In other words, what is more important is to properly allocate and manage the sea uses and activities, so that synergies are promoted and conflicts are avoided. This section identifies activities that are compatible with UCH, as well as activities affecting and seriously threatening this type of resource.

According to the existing literature and research experience, maritime activities that constitute threats to and may directly affect and damage UCH, include [22,28–31]: (a) All construction reaching the seabed (mining of fossils and metals, drilling, aggregates extraction, etc.); (b) all installations making use of the seabed (pipelines, cables, etc.); (c) certain fishing techniques (e.g., dragnet bottom-trawling) that create a great disturbance to all living and non-living resources found on the seabed; and (d) military and defense exercises and activities. Another serious threat now gaining intensity is

human interference directed at UCH, a result of technological developments that allow easier access by humans to submerged assets [2,32].

Beyond the above maritime activities directly affecting and harming UCH, there are also others that may indirectly affect submerged cultural assets. As the sea constitutes a blue continuum—where the flow of materials (substances, pollution, etc.) is unimpeded, following unpredictable patterns of dispersion and movement—UCH may also be threatened by activities that take place far from UCH sites [33]. Such activities include: Fossil fuel extraction, maritime transport, and military activities, i.e., all kinds of activities that threaten marine resources in case of technological disasters (e.g., oil spills). Beyond those activities, pollution from marine and land-based activities (e.g., marine litter, uncontrolled waste water disposal in the sea) is another threat for UCH [26,28,30,33–35].

Regarding the compatible uses and the synergies created with UCH, these may include: (a) Nature reserves and natural heritage sites (designated or not as MPAs), with which cultural assets co-exist harmoniously and enjoy recognition and protection; (b) scientific research ensuring enhancement of knowledge and education; and (c) recreation and marine tourism activities (wildlife watching, scuba diving, etc.), so that humankind benefits from the existence of UCH [8,29,36]. However, especially regarding tourism development and leisure opportunities, the challenges faced raise controversy. While tourism development is a promising option both in terms of job opportunities and economic growth, risks also exist, mainly due to the direct contact of humans with the submerged assets.

In short, the identification of compatible and incompatible uses with UCH is of prime importance when planning in areas including UCH resources. MSP implementations may ensure that conflicts and threats are avoided, creating conservation of UCH resources for present and future generations. Synergies may also be achieved, adding economic value to the UCH capital, which is a significant task if UCH is to receive priority over other activities and maritime regimes. Furthermore, the identification of conflicting and non-compatible uses is essential for coastal states, in order to establish restrictions and regulations, as well as safety distance limits between UCH and other uses, thus assisting decision-making (licensing, permissions, etc.) for activities in the buffer zones of UCH.

4. Implications and Prospects in Greece

4.1. The Context and Legislation for UCH Management and Preservation

Greece is a country with a long and glorious past that is reflected in its rich and magnificent monumental heritage spread throughout the country and well beyond its territorial seas. Indeed, according to a study conducted in 2010 [37], Greece counts more than 10,000 archaeological sites and ancient monuments and another few thousand monuments of modern times, found both on land and in the sea.

Having full acknowledgment of the invaluable cultural property located in areas of national jurisdiction (and well beyond), the Greek state (under the responsibility of the Ministry of Culture) has long established a full and integrated legislative framework to tackle all issues related to the management and protection of its cultural assets, both on land and in the sea [38,39] (see also Table 1). The first Greek law that governed Greek antiquities was passed in 1834. This was subject to amendments until 2002, when the latest law was adopted. This law (No 3028) covers national heritage, both tangible and intangible, of all periods of time, regardless of their location (even in areas beyond the national jurisdiction). The law also provides regulations on the preservation and management of the Greek monumental heritage, the most important being those included in Art. 13, introducing protection zoning for assets found both on land and in the sea. Two kinds of protection zoning were introduced [40]:

Protection zone A is the zone of absolute protection that usually delimitates the strict area of the monument or archaeological site. Within this zone, all kinds of interventions and constructions are prohibited (with the exception of actions taken for the restoration and preservation of the monument).

Protection zone B is the buffer zone, extending to such a distance as to include areas that interact with the monument and its surrounding landscape. According to the provisions of law 3028, in zone B, planning must include land-use restrictions and regulations, ensuring that the monument is protected from any kind of visual, aural, and olfactory nuisance, as well as other nuisances that are provoked by inappropriate action and excessive construction activity.

Table 1. Cultural heritage protection zones (jurisdiction under the Ministry of Culture).

1932	**Buffer zone of 500 m radius** (zone giving jurisdiction to the Ministry of Culture over building permissions)
1950	Landscapes of outstanding natural beauty (zone transferred to the Ministry for the Environment in 2011)
2002	**Protection zone A** and **protection zone B**

Source: adapted from [40].

In short, including a clear spatial dimension (planning tools and zones) in law 3028 was certainly a breakthrough in Greek cultural heritage legislation. However, what is more important than designating monuments and then delimitating protection zones is how to be consistent with the spirit of the cultural heritage legislation and the objective of preservation, without suppressing the need of areas to grow and develop, and the necessity of generations to evolve socially and economically.

4.2. UCH Sites and Designations

Greece has a long and rich cultural past, and it is estimated that a great number of cultural objects and sites exist on its seabed. So far, however, very few of them have been discovered and even fewer have been revealed to the public. This is deemed to be the result of: (a) The rough oceanography of the Greek sea floor, making the discovery of cultural objects very difficult, unless they are found very close to the shore or discovered by accident; (b) the natural phenomena and processes occurring underwater and on the seabed, which make it extremely difficult to locate objects and to find them well-preserved; (c) the scarcity of marine archaeological research in Greek territorial waters, mainly due to the difficulties and the high cost of working underwater, as well as the specialized experience and equipment needed; and (d) the secrecy with which most related research data and discoveries are treated, in order to avoid illicit actions (given that surveillance of underwater objects is almost impossible).

So far, the only official data in Greece (open to the public) concerning UCH sites and objects, are provided by the Hellenic Ministry of Culture and specifically, through its official data-base, also available online (http://listedmonuments.culture.gr). This data-base, however, includes information only on UCH sites that come with an act of designation. This means that no information is included either on submerged objects not yet designated nor on objects with high cultural value that should remain unknown to the public.

Given the above, this paper attempted original research in the official (open to the public) data-base of the Ministry of Culture, in order to record the designated UCH sites of Greece. According to this research, in total, 88 underwater archaeological sites were recorded, spread throughout the Greek territorial waters (see Table 2). The highest number of sites was recorded in the marine space surrounding the Peloponnese region, although in total, UCH presence is higher in the Aegean Sea.

The designation of UCH sites began in Greece in 1948 (in the commercial port of Rhodes). While these sites derive mainly from the Classical Era, their origin and construction range from the Bronze Age to the Hellenistic period. Regarding their location, the majority of designated UCH archaeological sites are coastal. This means they cover both terrestrial and marine areas and usually regard ancient cities that were eventually submerged (due to earthquakes, geological processes, etc.). On the contrary, those found totally underwater are usually ancient port infrastructures, walls, and sometimes wrecks with loads.

Table 2. Designated UCH sites in Greece.

Regions	Total (Underwater *)	First and Last Year of Designation	UCH Period of Construction
Peloponnese	21 (2)	1950–2009	Bronze Age up to post-Byzantine Era
North Aegean	17 (8)	1960–2006	Prehistoric Era up to Byzantine Era
South Aegean	16 (7)	1948–2012	Prehistoric Era up to post-Byzantine Era
Crete	13 (4)	1967–2005	Bronze Age up to modern Greek Era
Thessaly	10 (5)	1965–2004	Classical Era up to post-Byzantine Era
Attica	8 (2)	1979–2003	Bronze Age up to Early Byzantine Era
Central Greece	7 (2)	1985–2001	Classical Era up to post-Byzantine Era
Ionian Islands	3 (-)	1994–2003	Late Bronze Age up to post-Byzantine Era
Central Macedonia	2 (2)	1987–2003	Prehistoric Era up to Byzantine Era
Eastern Macedonia	1 (-)	1987	Classical Era
Epirus	-	-	-
Western Greece	-	-	-
TOTAL	**88**	**1948–2012**	-

* Number of sites being totally underwater (not extending both to terrestrial and marine parts). Source: http://listedmonuments.culture.gr (official data—Hellenic Ministry of Culture).

In short, UCH sites of Greece are of great historical value and of great national and international importance. However, the ones included in the database of the Ministry of Culture do not constitute the full list. Their number is estimated to be much higher, if one also considers those yet to be discovered (accidentally or not) or those yet to be designated, if the state chooses for inclusion in the list of the cultural heritage of the country. Whatever the actual number of UCH sites might be, existing trends in the marine space and the growing interest in allocating more human uses and installations in the sea are expected to raise controversy and dilemmas on the type of management to be adapted for UCH. The role of MSP in this decision-making will be decisive, given that its role is to regulate "when" and "where" human activities take place at sea, ensuring these are as efficient and sustainable as possible (European Commission).

4.3. The Blue Growth Trend and the Role of MSP in Greece: Challenges for UCH

Situated in the east Mediterranean Basin, between the Ionian and the Aegean Seas, Greece is known for its extremely insular and coastal nature. Thousands of islands, islets, and outcrops compose the marine space of Greece, which is also characterized by great depths, hosting significant species (catches, etc.), as well as a great variety of other living and non-living resources [18,20].

Given this peculiar nature, Greece has an interesting and long tradition in maritime economic activities, taking full advantage of its coastal and marine morphology and resources. According to recent statistics, Greece is placed among the top countries in the EU in fishing exports (free fishing and aquaculture), and among those with the largest shipping fleet in the world [21]. At the same time, due to its extremely insular nature, in the Greek marine space, a dense naval transportation system exists, with sea lanes serving passenger and commercial transit, as well as marine tourism.

With its maritime tradition and oceanographic features, Greece has always had a sectorial approach to maritime spatial planning (with the exception of the two marine national parks of Zakynthos and Alonnissos, whose management plans were the first to use a place-based planning approach) [41,42]. All sectors of the Greek maritime economy are regulated by equal (in number) national policy documents (approved by the relevant ministries), with the exception of the aquaculture sector, which is the only one that has a national spatial framework (adopted in 2011, via Official Gazette No 2505/B/2011) that sets the rules and regulations for the spatial organization of aquaculture activities. The key objective of all the above sectorial policy documents and spatial plans, is always the expansion of the sector in question, both geographically and economically.

Lately, however, this sectorial approach that has prevailed in Greece (placing an emphasis on the development of specific economic sectors in the sea) is being severely challenged by a more place-based approach, especially regarding spatial planning [41]. In fact, this transition from sectorial maritime spatial planning (MSP) towards MSP under a place-based approach became official in Greece after

the passage of the new law of 2018 (Law No 4546). According to this law (harmonizing the EU MSP Directive 2014/89), Greece must soon (i.e., before March 2021) approve maritime spatial plans under the ecosystem approach (which has as its prerequisite the endorsement of a place-based planning approach).

This latest trend in Greece towards a place-based approach in MSP is of great importance to UCH, which is found in abundance. This is firstly because place-based MSP may effectively tackle key challenges related to the blue growth trend currently taking place in the country (mainly related to the marine tourism sector and the developments in the fossil fuel extraction sector). Secondly, MSP under a place-based approach may ensure better organization and regulation of maritime activities that may directly or indirectly affect UCH. Finally, it can also provide solutions to upgrade the economic value of UCH to make it more appealing compared to other economic activities (having a more direct and extractive economic value).

5. Conclusions and Discussion

Underwater cultural heritage constitutes an invaluable resource, from an ecological, educational, and economic point of view, that needs acknowledgement and proper treatment to continue offering great benefits to humankind. However, despite its indisputable value, UCH has mainly been neglected in most marine planning attempts, given the sectorial approach that has prevailed until now when planning in the sea, placing an emphasis on certain economic activities and regimes. Lately, however, now that maritime spatial planning (MSP) under a place-based approach has been gaining ground all over the world, the opportunities and challenges for UCH are considerably different.

In Greece, although UCH resources are estimated to exist in abundance, so far, very few UCH sites have been discovered and even fewer have been shared with the public. The existing blue growth trend and the growing interest in allocating more human uses and installations in the sea are expected to raise controversy and dilemmas regarding the type of management to be adapted for UCH. Therefore, Greece has to proceed at a faster pace towards the elaboration of maritime spatial plans under a place-based approach, so that human activities are wisely regulated, avoiding user–use and user–environment conflicts and creating conditions for UCH conservation for present and future generations.

The key argument of this paper is that MSP can become a key procedure and a valuable ally of UCH. However, it is important to keep in mind that maintaining and integrating UCH into MSP requires that such resources are highly prioritized compared to other resources and maritime regimes. This challenge is probably the greatest for UCH in the era of blue growth, especially if one considers that even if UCH constitutes a resource of great socio-cultural value, it has very few direct or extractive uses of economic importance. Therefore, a future task for spatial planners and decision-makers will be how to reconcile the blue growth trend with UCH preservation and how to upgrade the economic value of UCH to make the conservation and enhancement of such resources a priority in MSP.

Given the above, the key issues discussed in this paper can have a practical application in the forthcoming development of maritime spatial plans in Greece, under a place-based approach. However, if the UCH parameter is to be properly considered in this process, future research must focus on a selected marine pilot area in Greece, where apart from the designated UCH sites, other submerged objects and coastal assets (having a cultural value) will also be evaluated (such as modern shipwrecks, submerged buildings, lighthouses, etc.). In this research, a key objective will be to identify and apply suitable methods (e.g., environmental economics) to value and evaluate UCH in a specific marine area. This will inevitably contribute to the preparation of Greece's first place-based maritime spatial plans, which must be completed and approved before 2021.

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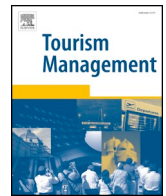
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The role and dimensions of authenticity in heritage tourism

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ABSTRACT

This study set out to investigate how authenticity affects tourist satisfaction with, and loyalty to, an attraction and its heritage value. Different factors were seen as likely to influence the various types of loyalty. Hahoe village in South Korea, a World Cultural Heritage listed area, was chosen as the research site. A survey of tourists was conducted, and 535 responses obtained for statistical analysis. The study discovered that tourist satisfaction from experiencing constructive and existential authenticity is a strong indicator of their intention to revisit. The results of this study can be applied to heritage tourism management, with the insightful message that constructive authenticity can strongly contribute to the satisfaction of heritage tourists when intangible tourism resources become tangible.

1. Introduction

Heritage tourism concerns the motivation to experience various items, representative of past and present periods, at a tourist destination (Adongo, Choe, & Han, 2017; Bryce, Curran, O'Gorman, & Taheri, 2015; Leong, 2016). Heritage tourism has steadily gained attention and has generated a growing body of literature (Chhabra, Healy, & Sills, 2003; Lee, Riley, & Hampton, 2010; Yeoman, Brass, & McMahon-Beattie, 2007). One of the important attributes in heritage tourism is authenticity or, at least, the perception of it (Xu, Wan, & Fan, 2014; Yi, Fu, Yu, & Jiang, 2018). Authenticity is acknowledged as an original, universal value and a crucial driving force motivating tourists to travel to distant places and experience different time periods (Daugstad & Kirchengast, 2013; Frisvoll, 2013). Present-day authenticity does homage to 'real' authenticity with the quest for authentic experiences being considered to be one of the main trends in tourism (Castéran & Roederer, 2013). However, since the characteristics of heritage tourism have undergone continuous change based on the evolving relationship between tourism and culture (Kang, Kim, Ryan, & Park, 2014; Steiner & Reisinger, 2006; Taylor, 2001; Waitt, 2000), heritage tourism can be explained as the consequence of wider social and economic trends that mark periods of 'late-modernism' or 'post-modernism' (Bruner, 1994, p. 397), and an essential aspect of the culture of modernity is the quest for an authentic experience (Mura, 2015).

Many scholars understand that the quality of heritage tourism is improved by authenticity (Lu, Chi, & Liu, 2015; Mura, 2015; Ram, Bjork, & Weidenfeld, 2016). The authenticity of tourism destinations, sites, events, cultures and experiences is of concern to practitioners and researchers in relation to the planning, marketing and management of heritage tourism (Buchmann, Moore, & Fisher, 2010; Kolar & Zabkar, 2010; Qiao, Choi, & Lee, 2016). In the current study, three dimensions of authenticity were examined - the objective (real), the constructive (sociopolitical), and the existential (phenomenological) - (Belhassen, Caton, & Stewart, 2008), and these were considered from two aspects that help to contextualize authenticity: space and time (Cook, 2010). We note that an important element of heritage tourism is the perception of authenticity (Cohen, 1988; Taylor, 2001; Waitt, 2000; Yi et al., 2018). Chhabra et al. (2003) explained the role of perceived authenticity as a measure of product quality and as a determinant of tourist satisfaction. Many researchers have also argued that the quality of heritage tourism is improved by authenticity. Shen, Guo, and Wu (2012) suggested that constructive authenticity and existential authenticity are significantly related, and existential authenticity can have significant effects on tourist loyalty. Therefore, as Poria, Butler, and Airey (2003) found, perceptions in heritage tourism are positively related to loyalty. However, in cultural and heritage tourism loyalty has rarely been investigated in relation to authenticity (Kolar & Zabkar, 2010).

Most studies have used simple phenomenological approaches in their research, and therefore the results often lack existential verification (Chhabra et al., 2003). Some existential studies have examined the authenticity of tourism objects, and the relationships between

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authenticity and tourism behavior; for example, the motivations of tourists to have cultural heritage experiences (Brown, 2013; Knudsen, Rickly, & Vidon, 2016; Steiner & Reisinger, 2006), what they want to experience, and the relationship between tourist loyalty and authenticity (Kolar & Zabkar, 2010). The main purpose of the current study was to identify the relationships between authenticity, satisfaction, and loyalty in heritage tourism, but we examine even deeper and more practical authenticity factors that add existential value to the global heritage tourism discipline.

Different factors influence loyalty and this study investigates perceptions of specific authenticity (objective authenticity, constructive authenticity, and existential authenticity) (Belhassen et al., 2008) and loyalty (cognitive loyalty, affective loyalty, and conative loyalty) (Yuksel, Yuksel, & Bilim, 2010). Therefore, the research questions we posed were: (1) What is the authenticity that tourists perceive in heritage tourism? (2) What are the relationships among the dimensions of this authenticity? and (3) What is the influence of authenticity on tourist satisfaction and loyalty? If fully established, the results of this study can contribute to the formation of a general concept of the attractiveness of a heritage site as a tourist destination. In addition, this paper makes suggestions in regard to future directions, the marketing of heritage tourism, and the sustainable management of heritage attractions. Thus, the study offers a theoretical and practical framework to guide research and practice.

2. Literature review

2.1. Heritage tourism

The growth in culture-based tourism is an expression of essential changes in contemporary preferences for quality, and the growing special interest in experiential markets (Xu et al., 2014). Heritage tourism has also been of growing interest to prominent global organizations (for example, UNESCO, 1999; World Tourism Organization, 1995) and governments (such as, Tourism Canada, 1991; Williams & Stewart, 1997). Demand for heritage-based tourism has been attributed to several factors: (i) an increasing awareness of heritage; (ii) an ability to express individuality through the awareness of historical environments or staged history; (iii) greater affluence, increased leisure time, mobility, and access to the arts; (iv) the need to surpass contemporary experiences to compensate for insufficiencies and demands; and/or (v) to meet psychological needs for continuousness through an appreciation of personal family history (Adongo et al., 2017; Asplet & Cooper, 2000; Lau, 2010). Experiencing heritage has become one of several priorities in the motivation to travel, resulting in a commercialization of the past (Waitt, 2000). Cultural heritage worth is consequently a cultural configuration incorporating tangible and intangible meanings of historical and cultural places (du Cros, 2001; Lee et al., 2010).

2.2. Authenticity in tourism

Authenticity can be seen as the quality of being 'authentic' and 'real' or 'real and genuine' (Chhabra, 2005; Frisvoll, 2013). The sense of 'genuineness' includes the 'real thing.' 'legitimacy,' and 'believability' (Di Domenico & Miller, 2012). The meaning of 'authentic' also includes 'veritable,' '*bona fide,*' 'reliable' and 'unquestionable' or 'reliable,' 'original,' and 'unquestionable' (Steiner & Reisinger, 2006). The various senses of authenticity (Table 1) include the following: (a) complete sincerity without feigning or play-acting, (b) a real actual character as contrasted with a deceptive appearance, (c) that which is genuine or true, for example, a real antique, (d) that which is original, not copied, for example, a hand-written manuscript, (e) that which is 'marked by close conformity to an original: accurately and satisfyingly reproducing essential features', for example, a portrait, (f) that which is 'marked by conformity to a widespread or long-preserved tradition', for example, a custom, and (g) that which is authoritative, authorized, or legally valid.

Table 1
Dimensions of authenticity.
Source: Adapted from Mantecón and Huete (2007).

Authenticity	Spatial	Built environment (Socio-spatial dimension)
		Natural environment
	Psychosocial	Values
		Behaviors

The first three meanings are relevant to relationship authenticity; 'authentic' connotes genuiness, truthfulness and sincerity (Lau, 2010, p. 484). Authentic cultural heritage experience means an unspoiled, pristine, genuine, untouched real and traditional experience (Belhassen et al., 2008, p. 671).

Authenticity involving experience and emotion is a long-standing stage of concern in philosophy and ethics (Di Domenico & Miller, 2012). Waitt (2000, p. 838) defined 'authenticity as being historic' and cultural, or connected to the past, and asked tourists to answer to items that signified history. Authenticity has often been related to the local area (place of origin), because tourists get motivated by the desire to experience somebody else's culture (Asplet & Cooper, 2000). Tourists are in search of 'the real' or 'the authentic,' because everyday life is full of the artificial or is full of the artificial and unnatural (Kolar & Zabkar, 2010; Rickly-Boyd, 2012). MacCannell (1999) concentrated on authenticity as a tangible quality that can be found in an object, while Cohen (1993: 374) proposed that authenticity was a 'socially constructed concept.' Some researchers have suggested that authenticity is not a tangible asset but, instead, is a judgment or value placed on the setting or product by its observers (Moscardo & Pearce, 1999; Xie & Wall, 2002), and that it can therefore be understood as an individually constructed, contextual and changing concept (Mura, 2015).

In tourism, authenticity is often related to tourism objects, tourism sites, tourist attractions and tourist experiences (Rickly-Boyd, 2012). Authenticity was introduced to sociological research by MacCannell (1973) in an attempt to understand tourists' travel experiences at historic and cultural sites (Lu et al., 2015). Hargrove (2002) argues that authenticity in heritage tourism is a crucial element of meaningful experiences, and the desire for authentic experience is one of the essential motivators for heritage tourists besides nostalgia and social distinction (Leong, 2016; Lu et al., 2015; Poria, Butler, & Airey, 2001). Authenticity is shown to significantly increase tourists' perceived value and satisfaction (Chen & Chen, 2010). Some writers suggest that satisfaction with heritage tourism relies not on the actual sense of authenticity but rather on tourists' perception of authenticity (Chhabra et al., 2003). In this sense, authenticity is seen as a critical factor having an influence/effect on tourists' overall estimation and it is supposed to be an important antecedent of positive destination image (Frost, 2006; Naoi, 2004).

Authenticity in tourism can thus be conceptualized as either object-related or visitor experience-related phenomena (Beverland & Farrelly, 2010; Reisinger & Steiner, 2006; Steiner & Reisinger, 2006; Wang, 1999). The first is objective and the other two subjective: constructivism and existentialism (Table 2). From the objective perspective, authenticity is a scientific or historical 'artifact', that is, the original, or at least an immaculate imitation of it (Kolar & Zabkar, 2010). Authenticity is present external to the tourist, being a special characteristic that is inherently found within an object, such as a product, an event, culture, relic or place (Cook, 2010; Naoi, 2004). Subjective constructivism using authenticity celebrates a mutual meaning-making process — embracing the idea that tourists actively construct their own meanings in negotiation with various environmental factors (Kim & Jamal, 2007). Theoretical approaches derived from the study of ritual make it possible to extend the constructivist position of Bruner (1994) and Cohen (1988) to also embrace situations in tourism where authenticity is at stake as a non-object-related experience. Constructive authenticity is therefore a negotiable (Cohen, 1988), contextual

Table 2
Three types of authenticity.
Source: Adapted from Wang (1999).

Pseudo-etic approach	Object-related authenticity	a) 'Objective authenticity' refers to the authenticity of originals.
		b) Correspondingly, authentic experiences in tourism are equated to an epistemological experience (cognition) of the authenticity of originals.
		a) 'Constructive authenticity' refers to the authenticity projected onto toured objects by tourists or tourism producers in terms of their imagery, expectations, preferences, beliefs, powers, and so on. There are various versions of authenticities regarding the same objects.
		b) Correspondingly, authentic experiences in tourism and the authenticity of toured objects are constitutive of one another. In this sense, the authenticity of toured objects is in fact symbolic authenticity.
Pseudo-emic approach	Activity-related authenticity	a) **'Existential authenticity'** refers to a potential existential state of being that is to be activated by tourist activities.
		b) Correspondingly, authentic experiences in tourism are to achieve this activate existential state of being within the luminal process of tourism. Existential authenticity may have nothing to do with the authenticity of toured objects.

(Salamone, 1997) and flexible judgment and/or valuation (Moscardo & Pearce, 1999), which gives rise to pluralistic and multidimensional interpretations (Bruner, 1994). From a semiotic point of view, constructive authenticity means stereotypical images, expectations and cultural heritage preferences (Naoi, 2004).

Subjective existential authenticity is "an alternative experience in tourism" (Wang, 1999, p. 358) with a focus on how open minded the tourist is to his/her experiences in the liminal spaces tourism offers (Brown, 2013). Considering that tourists' subjective authenticity perceptions play a more prominent role than actual authenticity in their evaluations of tourism experiences, this study employs tourists' subjective perceptions as a measure of authenticity (Lu et al., 2015). Existential authenticity involves internal fulfillment while constructivist authenticity is an external projection of expectations (Cook, 2010). Therefore, Wang (2000: 364–365) puts forth two aspects of existential authenticity, intrapersonal (bodily feeling and self-making) and interpersonal (family ties and *communitas*). The feelings and experiences of existential authenticity are constructed in social processes and therefore can be understood under constructivist authenticity (Olsen, 2002). Tourists perceive existential authenticity by constructing relationships between the places, spaces, objects and subjects in tourism (Ram et al., 2016; Yi et al., 2018). A search for existentially authentic experiences results in a preoccupation with feelings, emotions, sensations, relationships and self (Rickly-Boyd, 2012). In other words, existential authenticity is the subjective sense, vision, and dimension of a tourist attraction.

Authenticity as a 'state of being' includes a philosophical aspect of the self in context (the external world) and a reflection of how true one is to oneself in balancing the two parts of one's being, rational and emotional (Ram et al., 2016, p. 111). The existential approach builds on the tenets of constructivism, but utilizing a post-modern perspective further releases the individual. If constructivism is about meaning making, which still functions within boundaries, then existentialism in relation to authenticity is meaningless: where differences between real and unreal objects and experiences are no longer perceptible or relevant (Bruner, 1994; Kim & Jamal, 2007; Qiao et al., 2016).

2.3. Satisfaction

An understanding of satisfaction is basic for evaluating the performance of tourist attraction, destination products and services (Barr & Choi, 2016; Schofield, 2000). Most of the studies conducted to evaluate consumer satisfaction have used perceived-overall-performance (Petersen & Nysveen, 2001; Tse & Wilton, 1988) and models of expectation/disconfirmation (Chon, 1989; Francken & van Raaij, 1981; Oliver, 1980). According to the expectation-disconfirmation model of Oliver (1980: 462), consumers 'expect' before they 'purchase' or 'experience.' If the actual performance is better than their expectations, this leads to positive disconfirmation, which means that the consumer is satisfied. Consumers compare actual performance with their expectations before buying or experiencing. Chon (1989) found that tourist

satisfaction is based on goodness-of-fit and positive difference as the gap in relationships between expectations and the perceived outcome of the experience at a destination.

Leisure satisfaction is determined by consumers' perceived discordance between preferred and actual leisure experiences (Yuksel et al., 2010). By asking them to compare current travel destinations with other, similar places already visited, researchers can measure the satisfaction of tourists (Yoon & Uysal, 2005). Tse and Wilton (1988) showed that tourists' own evaluations of their satisfaction with travel experiences must be considered, regardless of their expectations. This means that tourists' actual experiences are evaluated to assess satisfaction after travel. Thus, tourist satisfaction is important for successful destination marketing as it influences the choice of tourism destination, the consumption of products and services while travelling, and the decision to revisit (Kozak & Rimmington, 2000; Yang & Peterson, 2004).

2.4. Loyalty

Previous studies have shown that customer loyalty is affected by customers' satisfaction (Oliver, 1999; Yuksel et al., 2010). In the marketing literature, repurchases or recommendations to other people are usually referred to as consumer loyalty with positive attitude (Yoon & Uysal, 2005). Loyalty measures consumers' strength of affection toward a brand product or service, in addition to being used to explain an additional portion of unexplained variance that behavioral approaches do not cover (Backman & Crompton, 1991; Yang & Peterson, 2004). The degree of destination loyalty is frequently reflected in tourists' intentions to revisit a destination and in their willingness to recommend it to others (Chen & Tsai, 2007; Oppermann, 2000). Research on the usefulness of the concept of loyalty and its applications to tourist destinations, attractions or services remains limited, even though loyalty has been thought of as a main driving force in a competitive tourism market (Evanschitzky & Wunderlich, 2006; Qiao et al., 2016). However, loyalty may not be enough to explain willingness to revisit or recommend (Yoon & Uysal, 2005).

Some researchers have discounted only the behavioral or attitudinal approaches (Backman & Crompton, 1991; Poria et al., 2001), maintaining that such approaches are insufficient to measure real action loyalty, including repurchasing, revisiting or recommending (Petersen & Nysveen, 2001). Consumers become loyal to a service first in a cognitive manner, followed by an affective 'like,' and later in a conative sense (Back, 2005). Oliver (1999) argues that consumers can be loyal at each phase of the attitude development process. At each loyalty stage, different factors influence respective degrees of loyalty (Evanschitzky & Wunderlich, 2006). In practice, action loyalty is difficult to measure and thus most researchers employ behavioral intentions, that is, conative loyalty, instead of real action loyalty (Yang & Peterson, 2004).

Cognitive loyalty, which is the first loyalty phase and its weakest form, is based on the product information available to the customer (Petersen & Nysveen, 2001). Cognitive loyalty is largely influenced by

the consumer's evaluative response to this experience, in particular to the perceived performance of an offering relative to price (Evanschitzky & Wunderlich, 2006) or superficial object. Affective loyalty is based on consumers' affect-based attitudes to a product, and is reflective of an established relationship between the consumer and the product (Yuksel et al., 2010). While affect is found to be stronger than cognition, affective loyalty is not a perfect predictor of behavioral loyalty (Petersen & Nysveen, 2001), which means *actions* based on loyalty. Researchers agree that the affective loyalty phase mainly involves emotions and satisfaction, which are significant in customer attitudinal loyalty formation (Bandyopadhyay & Martell, 2007; Han, Back, & Barrett, 2009; Oliver, 1999). Finally, in conative loyalty, consumers' behavioral intentions to keep on using the brand in the future, are argued to be the strongest predictor of behavioral loyalty (Barr & Choi, 2016; Petersen & Nysveen, 2001). Despite the many attempts to understand the links among the different loyalty phases, relatively little empirical research has been conducted on testing the relationship among the authenticity, tourist satisfaction and sequential loyalty in tourism.

3. Methodology

3.1. Research model

The authenticity relationships between constructs as tested in this study are based on Bruner (1994), Cohen (1988), Wang (1999), and Kolar and Zabkar (2010). Authenticity is a decisive variable that affects tourist satisfaction, and has been researched in many previous studies (Chhabra et al., 2003; Cho, 2009; Cohen, 1988; Naoi, 2004; Waitt, 2000). Precedent studies (Kozak & Rimmington, 2000; Yuksel et al., 2010) suggest that tourist satisfaction is a strong factor that affects revisitation and willingness to recommend to others. Based on these previous studies, the current study forms a multidimensional construct of the stages of loyalty (Back, 2005; Back & Parks, 2003; Evanschitzky & Wunderlich, 2006; Yuksel et al., 2010).

The major previous studies in the authenticy in the heritage tourism studies (Chhabra et al., 2003; Cohen, 1988; Kolar & Zabkar, 2010; Poria et al., 2003; Shen et al., 2012; Taylor, 2001; Waitt, 2000) helped in determining the theme of the hypotheses in the current study. As a result, this study tackled five areas: (a) It measured the relationships among the three factors of authenticity (objectivism, constructivism, and existentialism); (b) It attempted to determine which one has the most influence on authenticity; (c) It attempted to identify which one has the most powerful influence on tourist satisfaction; (d) It explored whether or not there is a significant relationship between tourist satisfaction and the factors of loyalty; and (e) It measured the relationships among the three factors of loyalty (cognitive loyalty, affective loyalty, and conative loyalty). Along with the proposed conceptual relationship model (see Fig. 1), the study tested five hypotheses:

H1: Object-based authenticity (that includes both objective authenticity and subjective authenticity) significantly influences existential authenticity;
H2: Authenticity significantly influences tourist satisfaction;
H3: Authenticity significantly influences tourist loyalty;
H4: Tourist satisfaction significantly influences tourist loyalty; and
H5: There are significant relationships among the different dimensions of tourist loyalty.

The research adopted a questionnaire survey methodology. The questionnaire was designed based on a review of the literature and on an examination of the specific characteristics of heritage tourism. It had four parts: Part 1 measured authenticity (objective, constructive, and existential authenticity) with 12 items; Part 2 used three items to measure tourist satisfaction; Part 3 focused on the loyalty construct associated with cognitive, affective and conative loyalty, and included nine items; and finally, Part 4 reported on demographic information,

with eight items including age, gender, education, occupation, monthly household income, number of visitation, type of accompany, and source of information being covered. All items in the first three parts were measured on a 7-point Likert-type scale from 'strongly disagree (= 1)' to 'strongly agree (= 7)'.

3.2. Data collection

The research site in this study was the Hahoe village in Andong city, South Korea (*hereafter* Korea), one of the few places to successfully preserve the unique residential architecture and distinctive village structure of Korea's Joseon Dynasty (1392–1910 AD). The village is authentic, still inhabited, and designated as a historic conservation village by the Korean Government. The village was listed with UNESCO as a World Cultural Heritage site in 2010. As the village is surrounded by high mountains as well as a river it has never been invaded or heavily damaged. It became well-known historically through a famous local Confucian scholar, Ryu (1542–1607 AD), and there are a total of 176 resident families in the village based on the single Ryu family clan.

For the pilot study, 22 tourists who visited Hahoe village were randomly interviewed and the questionnaire was then revised to ensure reliability and content validity. The self-administered method was used in the main data collection. The surveys were distributed by researchers who understood the subject matter to visitors to Hahoe village (the author and two Master degree students majoring in tourism management). A small gift (a packet of travel tissues) was given to each respondent to encourage participation, and the survey was conducted inside Hahoe village for three weeks in October, one of the most popular tourism seasons of the year in Korea. Most respondents were given the questionnaire in the concert gardens area, in rest areas, or at the exit of the village, and it took about 10 min per person to complete. The researchers stayed at Hahoe village for the entire survey period, to secure enough time for data collection. Only those who showed a positive and friendly attitude to the researchers were selected for the survey, and each respondent was given information about the survey's purpose just before answering. While the respondents were completing the survey, one of the researchers was standing by to answer any queries.

Out of 593 surveys collected, 535 were used in the analysis after excluding 58 that appeared to be incomplete. The collected data were analyzed using the statistics packages SPSS 19.0 and AMOS 18.0. Frequency, confirmatory factor, correlation and structural equation model (SEM) analyses were conducted to test the proposed hypothetical model. Confirmatory factor analysis is a rigorous method used to draw a uni-dimensional, credible and valid result from the data. Kline (2005) notes that it is not necessary to use the data to remove certain variables after an exploratory factor analysis has been performed to perform a confirmatory factor analysis. Consequently, the study analyzed the proposed hypothetical model by confirmatory factor analysis without a prior exploratory factor analysis.

4. Results

Of the 535 respondents, 42.8% were male and 57.2% female. Their ages ranged from teens to 60s and above, and 53.8% were aged between 30 and 40. A majority of the respondents were a graduate of university/college (65.2%) and 28.4% indicated their monthly household income to be US$40,000 or greater. Many of the respondents were professionals (29.7%), 57.4% were visiting Hahoe village for the first time, and 56.6% were accompanied by family and relatives. 59.6% of the respondents answered that they knew about Hahoe village before they visited. Finally, sources of information about the village were the Internet (39.6%), word of mouth (28.0%), other (21.7%), travel brochures (9.0 percent), and travel agencies (1.9 percent).

A confirmatory factor analysis (CFA) was used to reveal the factor loadings of the seven constructs (objective authenticity, constructive
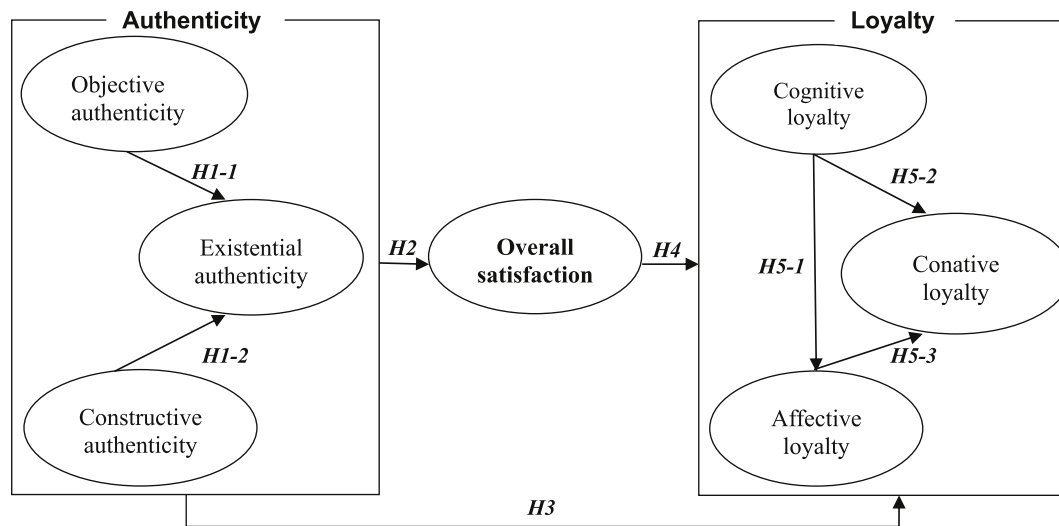
Fig. 1. The research model.

Table 3
Convergent validity.

Constructs	Items	Mean	Standardized factor loading	Error	Construct reliability	Average variance extracted
Objective Authenticity	OA-1	4.901	0.765	0.657	0.802	0.575
	OA-2	5.249	0.850	0.382		
	OA-3	5.178	0.839	0.451		
Constructive Authenticity	CA-1	4.890	0.738	0.621	0.771	0.529
	CA-2	4.897	0.815	0.471		
	CA-3	5.346	0.814	0.574		
Existential Authenticity	EA-1	4.460	0.809	0.514	0.863	0.611
	EA-2	4.518	0.860	0.386		
	EA-3	4.703	0.868	0.343		
	EA-4	4.581	0.809	0.540		
Overall Satisfaction	OS-1	4.994	0.904	0.271	0.874	0.698
	OS-2	4.793	0.831	0.370		
	OS-3	4.744	0.898	0.359		
Cognitive Loyalty	CL-1	4.179	0.812	0.457	0.825	0.610
	CL-2	4.413	0.840	0.434		
	CL-3	4.181	0.838	0.429		
Affective Loyalty	AL-1	4.634	0.881	0.358	0.893	0.736
	AL-2	4.430	0.915	0.259		
	AL-3	4.271	0.920	0.267		
Conative Loyalty	CNL-1	3.983	0.951	0.213	0.856	0.749
	CNL-2	3.694	0.912	0.370		

X^2 (df, significant) = 427.510 (df = 168, p = 0.000), Q = 2.545, RMSEA = 0.054, GFI = 0.929, AGFI = 0.902, NFI = 0.956, CFI = 0.973, RMR = 0.051

authenticity, existential authenticity, tourist satisfaction, cognitive loyalty, affective loyalty, and conative loyalty), and to assess the model fit. The model adequacy was assessed by the fit indices suggested by Kim (2009, pp. 371–374). In any data analysis the convergent validity of CFA results should be supported by item reliability, construct reliability, and the average variance extracted (from Hair et al., 1998; cited by Chen & Chen, 2010). The chi-square test is often very sensitive to sample size and therefore X2/df was used as an alternative in the current study. As shown in Table 3, construct reliability estimates range from 0.771 to 0.893, which exceed the critical value of 0.7, indicating a satisfactory estimation. The average extracted variances of all constructs range between 0.529 and 0.749, which is above the suggested value of 0.5. These indicate that the measurement model has good convergent validity. Therefore, the hypothesized measurement model is reliable and meaningful, and can be used to test the structural relationships among the constructs.

The structural model was estimated using a maximum likelihood estimation method and a correlation matrix as input data. The overall model indicates that X^2 = 427.510, d.f. = 168 and is significant at p < 0.001. Technically, the p-value should be greater than 0.05, or

statistically insignificant, to indicate that the model fits the empirical data. The X^2/d.f. ratio of less than 5 is used as the common decision rule of an acceptable overall model fit. The normed X^2 of the model is 2.6 (that is, 427.510/168), indicating an acceptable fit. Furthermore, other indicators of goodness-of-fit are RMSEA = 0.054, GFI = 0.929, AGFI = 0.902, NFI = 0.956, CFI = 0.973 and RMR = 0.051.

Comparing these data with the corresponding critical values shown in Table 3 suggests that the hypothesized model fits the empirical data well. Within the overall model, the estimates of the structural coefficients provide the basis for testing the proposed hypotheses. This study examined the structural model with two exogenous constructs (objective and constructive authenticity) and five endogenous constructs (existential authenticity, tourist satisfaction, and cognitive, affective and conative loyalty). Therefore, the proposed structural model was tested to estimate five Gamma parameters and five Beta parameters.

Fig. 2 provides details on the parameter estimates for the model, and reports the results of the hypothesis testing. In total, eight of the 20 hypotheses were supported. In the analysis of Hypothesis 1, constructive authenticity had a significant positive effect on both existential authenticity and tourist satisfaction (r1-2 = 0.809, t-
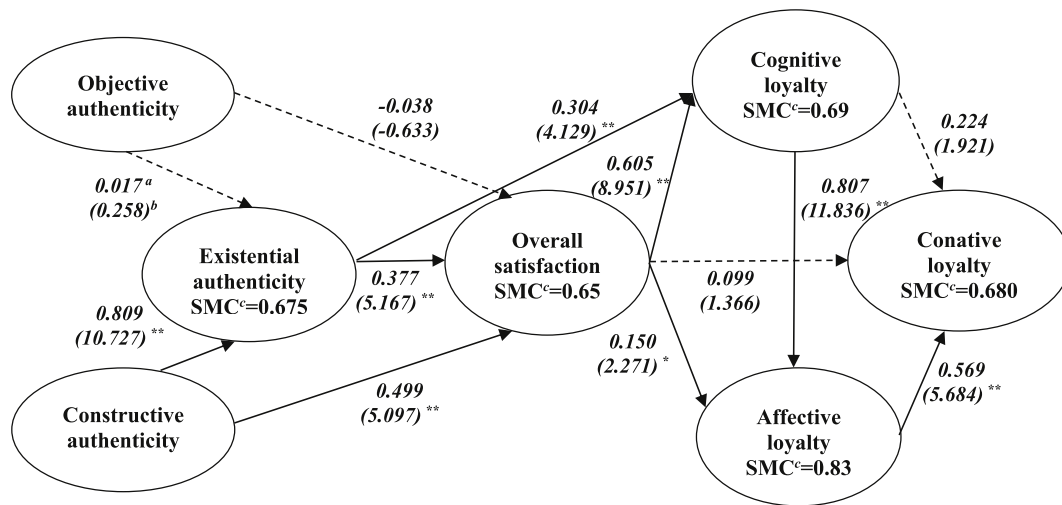
Fig. 2. The results of testing the hypothetical model. Note: Chi-square (df, significance) = 427.510 (df = 168, p = 0.000); *p < 0.05, **p < 0.01, Q = 2.545, RMSEA = 0.054, GFI = 0.929, AGFI = 0.902, CFI = 0.973, NFI = 0.956 and RMR = 0.051; a: path coefficient, b: critical ratio, c: squared multiple correlation (The results only show the significant relationships identified).

value = 10.727, p < 0.01 and r2-2 = 0.499, t-value = 5.097, p < 0.01, respectively), but not on objective authenticity (r1-1 = 0.017, t-value = 0.258 and r2-1 = −0.038, t-value = −0.633). It is confirmed that objective authenticity of the tourism objects does not significantly affect existential authenticity in cultural heritage tourism; and that constructive authenticity makes a significant influence to existential authenticity and tourist satisfaction. Existential authenticity had a significant positive effect on both tourist satisfaction and cognitive loyalty (r2-3 = 0.377, t-value = 5.167, p < 0.01 and r3a-3 = 0.304, t-value = 4.129, p < 0.01). Thus, existential authenticity was found to make a significant influence to tourist satisfaction, and constructive authenticity had even more influence on satisfaction than existential authenticity.

Among the authenticity factors, it is confirmed that only existential authenticity has a positive significant influence on cognitive loyalty. Thus, Hypotheses H1, H2 and H3 were partially supported, while H3b and H3c were totally rejected. Tourist satisfaction, as hypothesized, had significant positive effects on both cognitive and affective loyalty (b4-1 = 0.605, t value = 8.951, p < 0.01 and b4-2 = 0.150, t-value = 2.271, p < 0.05). Cognitive loyalty had significant positive effects on affective loyalty (b5-1 = 0.807, t-value = 11.836, p < 0.01) and affective loyalty had significant positive effects on conative loyalty (b5-3 = 0.569, t-value = 5.684, p < 0.01). A tourists' cognitive loyalty is found to have a more significant influence on affective loyalty than conative loyalty, and affective loyalty has more influence on conative loyalty than cognitive loyalty. Thus, H4 and H5 were also partially supported.

As discussed above, the research hypotheses are found to be partially supported, that is to say, some variables do not have a directly influential relationship as first thought. Thus, the authors of the current study analyzed the indirect variables that affect dependent variables, as moderated by more than one intermediate variable, because we are not able to measure the size of any effect if we only judge the relationships between variables by direct effects. The results of this analysis are presented in Tables 4 and 5, and indicate that indirect effects exist among all the variables, except in relation to a tourist's objective view of authenticity.

The direct effect of existential authenticity on cognitive loyalty was calculated at 0.304. The indirect effects of constructive and existential authenticity on cognitive loyalty were 0.732 and 0.228 respectively. With respect to total effects, the former (0.742) was greater than the latter (0.533). The effect of constructive authenticity on cognitive loyalty mediated by existential authenticity and/or tourist satisfaction

was 0.732; resulting in a total effect of 0.742. Additionally, existential authenticity had a direct effect (0.304) in addition to an indirect effect (0.228) mediated by tourist satisfaction. The direct effects of constructive and existential authenticity on affective loyalty were not identified. With respect to indirect effects, the former (0.705) was greater than the latter (0.487), and for a total effect also. In addition, the direct effects of constructive and existential authenticity on conative loyalty were not identified. With respect to indirect effects, the former (0.642) was greater than the latter (0.423), and for a total effect as well. However, the most significant result of the current study is that constructive authenticity does not have a directly significant influence on any of the factors within the form of loyalty subsumed in Hypothesis 3. Furthermore, our analysis of the indirect and total effect indicates that while constructive authenticity exists in all the loyalty variables, its most significant effects are on affective loyalty, cognitive loyalty, and conative loyalty, in that order.

The effect of existential authenticity on conative loyalty as mediated by tourist satisfaction, cognitive loyalty and/or affective loyalty was 0.423, resulting in a total effect of 0.441. The direct effect of tourist satisfaction on cognitive and affective loyalty was determined at 0.605 and 0.150 respectively. Therefore, only existential authenticity has a direct influence on cognitive loyalty among all the authenticity factors, contributing to the result that cognitive loyalty has more significant total effect than affective or conative loyalties on tourist satisfaction.

The indirect effect of tourist satisfaction on affective and conative loyalty was 0.488 and 0.499 respectively. With respect to the total effects found, affective loyalty (0.638) was greater than cognitive loyalty (0.605) and conative loyalty (0.598). The effect of tourist satisfaction on conative loyalty as mediated by cognitive loyalty and/or affective loyalty was 0.499, resulting in a total effect of 0.598. This means that tourist satisfaction does not directly influence conative loyalty but has indirect effects and total effects on cognitive and affective loyalties. And it is confirmed that there exits a significant total effect on affective, cognitive, and conative loyalties respectively. Also, tourist satisfaction had a direct effect (0.150) in addition to an indirect effect (0.488) on affective loyalty mediated by cognitive loyalty. The direct effect of cognitive loyalty on affective loyalty was 0.807, and the effect of cognitive loyalty on conative loyalty as mediated by affective loyalty was 0.460, resulting in a total effect of 0.684. Finally, the direct effect of affective loyalty on conative loyalty was 0.569. In summary, cognitive loyalty does not directly influence conative loyalty; but it does have indirect effects via affective loyalty, and this produces significant total effects. That means that cognitive loyalty directly influences affective

Table 4
Test of hypotheses.

Hypothesis (Path)		Coefficients	S. E.	C. R. (= t)	Result
H1 Object-based authenticity significantly influences existential authenticity.					
H1-1	Objective Authenticity → Existential Authenticity	0.017	0.062	0.258	Rejected
H1-2	Constructive Authenticity → Existential Authenticity	0.809	0.070	10.727**	Supported
H2 Authenticity significantly influences overall satisfaction.					
H2-1	Objective Authenticity → Overall Satisfaction	−0.038	0.053	−0.633	Rejected
H2-2	Constructive Authenticity → Overall Satisfaction	0.499	0.083	5.097**	Supported
H2-3	Existential Authenticity → Overall Satisfaction	0.377	0.067	5.167**	Supported
H3 Authenticity significantly influences loyalty.					
H3a-1	Objective Authenticity → Cognitive Loyalty	−0.059	0.055	−0.988	Rejected
H3a-2	Constructive Authenticity → Cognitive Loyalty	0.010	0.091	−0.096	Rejected
H3a-3	Existential Authenticity → Cognitive Loyalty	0.304	0.070	4.129**	Supported
H3b-1	Objective Authenticity → Affective Loyalty	0.034	0.053	0.695	Rejected
H3b-2	Constructive Authenticity → Affective Loyalty	−0.034	0.088	−0.400	Rejected
H3b-3	Existential Authenticity → Affective Loyalty	−0.018	0.071	−0.288	Rejected
H3c-1	Objective Authenticity → Conative Loyalty	0.074	0.077	1.325	Rejected
H3c-2	Constructive Authenticity → Conative Loyalty	−0.128	0.127	−1.342	Rejected
H3c-3	Existential Authenticity → Conative Loyalty	0.017	0.101	0.246	Rejected
H4 Overall satisfaction significantly influences loyalty.					
H4-1	Overall Satisfaction → Cognitive Loyalty	0.605	0.070	8.951**	Supported
H4-2	Overall Satisfaction → Affective Loyalty	0.150	0.081	2.271*	Supported
H4-3	Overall Satisfaction → Conative Loyalty	0.099	0.113	1.366	Rejected
H5 Loyalty significantly influences the relationships among the dimensions of loyalty.					
H5-1	Cognitive Loyalty → Affective Loyalty	0.807	0.081	11.836**	Supported
H5-2	Cognitive Loyalty → Conative Loyalty	0.224	0.176	1.921	Rejected
H5-3	Affective Loyalty → Conative Loyalty	0.569	0.128	5.684**	Supported
X^2 (df, significant) = 454.191 (df = 174, p = 0.000), Q = 2.610, RMSEA = 0.055, GFI = 0.925, AGFI = 0.900, NFI = 0.952, CFI = 0.970, RMR = 0.056					

*$p < 0.05$, **$p < 0.01$.

Table 5
Direct, indirect and total effects of relationships.

Path		Direct	Indirect	Total
H1	Constructive Authenticity → Existential Authenticity	0.809**		0.809**
H2	Constructive Authenticity → Overall Satisfaction	0.499**	0.305**	0.804**
	Existential Authenticity → Overall Satisfaction	0.377**		0.377**
H3	Constructive Authenticity → Cognitive Loyalty	0.010	0.732**	0.742**
	Existential Authenticity → Cognitive Loyalty	0.304**	0.228**	0.533**
	Constructive Authenticity → Affective Loyalty	−0.034	0.705**	0.672**
	Existential Authenticity → Affective Loyalty	−0.018	0.487**	0.468**
	Constructive Authenticity → Conative Loyalty	−0.128	0.642**	0.515**
	Existential Authenticity → Conative Loyalty	0.017	0.423**	0.441**
H4	Overall Satisfaction → Cognitive Loyalty	0.605**		0.605**
	Overall Satisfaction → Affective Loyalty	0.150*	0.488**	0.638**
	Overall Satisfaction → Conative Loyalty	0.099	0.499**	0.598**
H5	Cognitive Loyalty → Affective Loyalty	0.807**		0.807**
	Cognitive Loyalty → Conative Loyalty	0.224	0.460**	0.684**
	Affective Loyalty → Conative Loyalty	0.569**		0.569**

*$p < 0.05$, **$p < 0.01$.

loyalty; and that affective loyalty significantly influences conative loyalty.

5. Discussion and conclusions

Today, many tourists seek authentic experiences pertaining to different cultures and histories at heritage sites. Authenticity is a pivotal component for tourists who expect to experience the heritage of other cultures when they travel. Thus, the purpose of this study was to identify what tourists expect and value when they visit heritage tourist destinations. Specifically, this research verified how tourists perceive authenticity when they travel. In recent years, existential authenticity has gained strong academic attention (Belhassen et al., 2008;

Buchmann et al., 2010; Kim & Jamal, 2007; Pons, 2003; Steiner & Reisinger, 2006), and researchers have investigated the more existential forms of authenticity as opposed to concentrating on object authenticity. In other words, authenticity in heritage tourism is the representation of a historical time and place within original or reconstructed sites and intangible characteristics as interpreted by a person and social culture.

The results of the current study can be summarized as follows. First, objective authenticity in heritage tourism does not significantly influence attraction loyalty in any form of existential authenticity relating to tourism behavior, tourist satisfaction, or future behavioral intention. Second, tourists' constructive authenticity significantly affects existential authenticity and tourist satisfaction, while it also has an indirect influence on all loyalty factors, and it has larger total effects than existential authenticity. Third, existential authenticity has a directly significant influence on tourist satisfaction and cognitive loyalty, and also has an indirect influence on the other two types of loyalties (affective and conative loyalty). Fourth, tourist satisfaction has directly significant influence on cognitive and affective loyalties, whereas it indirectly influences conative loyalty. This implies that tourist satisfaction on the authenticity in cultural heritage tourism does not directly affect the conative loyalty that influences their future behavioral intention; but it affects formation of conative loyalty via cognitive and affective loyalties. Finally, tourists' cognitive loyalty has more influence on affective loyalty than conative loyalty; whereas affective loyalty influences conative loyalty. This means a tourist's overall perception based on the values of tourism objects forms the final attitude towards authenticity.

5.1. Contribution to theoretic development

This study examined the concept of authenticity and empirically confirmed the relationships between authenticity, satisfaction, and loyalty of tourists in cultural heritage tourism. First, it has been argued that historical atmospheres and constructive authenticity that transcend

space influence the existential authenticity that is personally perceived through emotions and subjectivity. This, as a significant result, supports more specifically the research results of Jang and Choi (2007), and Kolar and Zabkar (2010). At the same time, the results confirm that constructive authenticity among the authenticities relating to tourism destinations has a significant influence on existential authenticity. In other words, constructive authenticity is seen to have a positive impact on existential authenticity because the perspective of the tourists is projected within the timeframe that is the historical background.

Second, the results of previous studies regarding the influencing relationships between satisfaction and authenticity as perceived by tourists identified that the path from authenticity to satisfaction was a suitable theoretical structure. However, the results showing that objective authenticity does not have a significant influence on satisfaction can be understood as: (a) a lack of awareness regarding the objective fact that the visited site is cultural heritage having an historical value; or (b) as the gratification of an obvious fact that does not extend further into satisfaction. This means that it meets the physical requirements, but there is no satisfaction or dissatisfaction in the subjective dimension. However, as evaluations of dissatisfaction follow immediately when these factors are not met, tourism destination managers must continue to manage tourism destinations with respect to the factors that, essentially, *have* to be met. In addition, if tourists do not personally feel a real inspiration within the course of their sightseeing, this demonstrates that they are not satisfied. Thus, the subjective perception of tourists plays a decisive role in satisfaction rather than the attributes of the cultural heritage item itself.

Third, it was confirmed that existential authenticity is among the dimensions of authenticity that affects a tourist's motivation for activities. Existential authenticity through experience has a direct influence on cognitive loyalty is the result of the qualitative assessment of these attributes in tourism studies. These results imply that the perceived authenticity derived from freely expressing themselves in a new place different from their daily lives, informs a loyalty that may affect future behavior. Therefore, continuous efforts are urgently demanded for tourism destination sites to consider existential authenticity through using tourism resources that can stimulate the process of personal self-reflection or self-discovery of the tourists, within their experiences of tourism activities. Tourists form cognitive loyalties regarding tourism destinations, while they perceive the attributes and qualitative aspects of the site through experience, and confirm the importance of the constructive authenticity that induces existential authenticity. The overall structure, atmosphere and authenticity perceived within the activities experienced was found to have a significant meaning in the future behavior intentions of tourists.

Fourth, it was demonstrated that satisfaction directly affects the formation of cognitive loyalty and affective loyalty while excluding conative loyalty, the willingness to revisit or recommend, and that an apparent causal relationship between the dimensions of satisfaction and loyalty exists as conative loyalty is formed after the formation of affective loyalty. The perception of tourists and loyalty from an affective aspect can be seen to have an impact on positive word-of-mouth, and the conative intention to revisit. Accordingly, satisfaction and loyalty can be indicators of future behavior and are factors that can be used to understand the behavior of tourists. Furthermore, it was identified that potential tourists trust most of all positive word-of-mouth and the recommendations of experienced tourists. This study, based on the results of examining the behavioral aspects of the emotions and perceptions of loyal tourists, shows that these can be used to maintain loyal customers or secure potential customers.

In addition, there is significance in the establishment of the overall structural relationship among the theoretical concepts by verifying them empirically, in contrast to previous studies that independently verify the relationships among the concepts. It is believed that the structure influencing relationships among the multi-dimensionally derived dimensions of authenticity, satisfaction and loyalty will sufficiently reflect tourist behavior, in addition to understanding and predicting the decision-making processes of tourists. Consequently, it is suggested that tourists do not feel strong satisfaction without inspiration within the course of sightseeing. Existential authenticity caused by experiential activities and perceptions regarding the constructive authenticity of the tourists can be seen as a most influential factor in tourist satisfaction. Finally, this study has importance in providing a comprehensive perspective that examines the socio-cultural significance for understanding complex tourism phenomena and tourist behaviors based on the concepts of authenticity.

5.2. Practical implications

The results of this study can assist in developing marketing strategies that will contribute to the formation of satisfaction and loyalty by determining the authenticity of tourist perception in heritage destinations. Operational suggestions are as follows: First, among the authenticities of tourist destinations in cultural heritage tourism, objective authenticity does not have significant effects on existential authenticity, and the satisfaction of the tourists was confirmed. Eventually, without the intrinsic qualitative value, fundamental information and meanings held by cultural heritage items, the exterior preservation of the original is merely a spectacle for tourists as potted history and culture. Therefore, promotional and experience programs should be developed that contain commentaries providing communication with the cultural heritage that is historically meaningful to tourists through interpretation. In other words, rather than the rarity of an objective heritage, the whole atmosphere of the Hahoe village or traditional landscape and folk performances should be segmented more variously, and introduced to tourists as a functioning whole.

Moreover, there is a need for tourism destinations having historical heritage resources to properly deliver the meaning that heritage holds from the perspective of history and culture, by using professionals or notices rather than imposing a superficial viewing of historical heritage upon tourists. In addition, active experience programs that introduce vitality to historical heritages, such as storytelling using intangible cultural assets like traditional performances or folk plays, should be activated so that tourists can experience authenticity within the historical space of those heritage tourism destinations. Furthermore, opportunities and events where tourists can experience the daily life of the time or the making of traditional dishes must be configured into the mix. Such commercialization of tourism can provide fresh meanings for the people regarding cultural heritage that might not have been of much interest, and rather, can be used as a new opportunity for the preservation and revitalization of historical heritage and a support for its continuous management.

Second, both constructive authenticity and existential authenticity have a significant impact on loyalty. From this, tourists can be assumed to form loyalties in the aspects of attitude and feeling satisfaction, through the reproduction of traditional performances or folk-plays based on historical truths within the landscape and background of the location. This becomes the background of the image and atmosphere of the historical time within the tourism destinations. Therefore, tourists form satisfaction and loyalty by authenticity through personal experience, rather than through the authenticity of the tourism destinations themselves. Accordingly, the management of tourism destinations should not only develop tangible cultural contents, but also configure traditional performances or folk plays with experiential programs, including screenplays in which tourists can personally participate. Tourism destinations should not simply display cultural heritages, but

provide abundant experiential activities that increase the value of the cultural heritages through stories focused on the historical background, and figures intertwined with the cultural heritage.

For example, in Hahoe village, attempts to engage the spectators are made during the reproduction of the Hahoe Mask Dance. However, participation is not only simply induced by words; the performers go down from the stage and naturally mix in with the people as they keep the flavor of the previous time. In addition, there is a need for traditional games that can be played by tourists, taking into consideration those that can induce participation or for programs where tourists can participate in the march along the path within the village. Moreover, experience events where tourists can wear jewelry or clothes that cannot be experienced in daily life should be provided — by exploring ways to lend traditional shoes, costume, hat, mask, and so on — while visiting the village.

Third, among the tourists of the Hahoe village — the target of this study — it is considered advantageous for tourists with apparent purpose, such as fulfilling their desire to acknowledge the high importance of cultural experience, to form relationships as loyal customers. In addition, the characteristics of the cultural tourists must be taken into consideration where the satisfaction and revisit rates of tourists increase through traditional cultural events carried out in cultural tourism destinations. Therefore, there is a need for executives and managers of cultural heritage tourism destinations to reproduce a traditional culture where both the tourism destination and the tourists can experience a mutual consensus. For example, materials that can be recalled in daily life after the tour, such as establishing footprints on the ground within the Hahoe village, where tourists can mimic the gait of noblemen filled with pretension around the house, should be provided. Moreover, not only the representative locations of each heritage tourism destination should be promoted, but various less popular locations should also be introduced.

Thus, the results of the study present a number of messages. Because tourists already consider cultural motivation and importance before travelling to a cultural heritage site, authenticity is often taken for granted during their travel. Cultural heritage tourists will not be satisfied if they cannot enjoy impressions from the general ambience and atmosphere while they travel, even although cultural heritage is well preserved. That means the experience will merely be of a simple attraction stuffed with unapproachable history and culture, if a cultural heritage site does not deliver internal quality values and fundamentally interesting and interactive contents. Therefore, it is strongly recommended that attractions should provide interpretation and explanation of each heritage site from a professional cultural heritage commentator, to present the background story of the cultural heritage site, and provide a common place where tourists can gain experience about a heritage site or other historical and cultural activities that will have them reflect on the days when the heritage site was built.

5.3. Limitations and further research

Although this study produced insightful results and provided theoretical and practical contributions, it is not free from limitations. First, there is the limitation of objectivity in the composition of the sample that consisted only of visitors to the Hahoe village in Andong City. In future research, there is a need to examine the perspective of local residents in addition to domestic and foreign visitors, and include more diverse regional cultural heritage attractions by expanding the range of spaces and targets. Second, as the temporal range of this study was limited to a cross-section at a certain point-in-time, to be able to

generalize the results requires a longitudinal study that also considers the impact of seasonality and other variables. The direction of future research must be towards strengthening such generalizations. Furthermore, it is hoped that research can be actively carried out regarding the cultural authenticity that can inform the originality of a unique culture. By evaluating the various measurement items of such a study as they are applicable to heritage tourism, insufficient interpretations and resources can be identified. Continuous reviews can thus contribute to the enhancement of the quality of all heritage tourism destinations, especially when generalized measurements are developed. In addition, expanding the horizons of local residents using the resulting research into tourist perspectives would expand cultural heritage knowledge in host communities, and further prove the value of research activities that are conducted from diverse perspectives.

Author contribution

Eunkyung PARK: Designing the research framework of the study, Collecting secondary data on the main theme of the study (Literature review), Conducting field survey activities, Analyzing the fieldwork data. **Byoung-Kil CHOI**: Setting up aims of the study, Literature review, Analyzing the fieldwork data. **Timothy J. LEE**: Literature review, Analyzing the fieldwork data, Writing up the paper in English, English proofreading and editing.

Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.tourman.2019.03.001.

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ARTICLES FOR FACULTY MEMBERS

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Research on the Ways to Protect and Inherit Intangible Cultural Heritage in the Information Age

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Abstract. Intangible cultural heritage is an important part of Chinese culture. With the development of the times, some problems gradually appear in the process of protecting and inheriting intangible cultural heritage, and the government and society also pay more attention to the protection and inheritance of intangible cultural heritage. In this paper, two ways are proposed to strengthen the protection and inheritance of intangible cultural heritage in the information age, that is, to strengthen the development of intangible cultural heritage tourism based on smart tourism and intangible cultural heritage campus education inheritance based on intelligent education, by expounding the significance of protecting and inheriting intangible cultural heritage and analyzing the methods and existing problems of protecting and inheriting intangible cultural heritage.

1. Related Concepts

The concept of informatization was first put forward by Japanese scholars in 1960s, then spread to western countries, and was widely used in European and American countries in the late 1970s. The so-called informatization refers to using intelligent tools such as network, modern communication technology and database technology to study all elements and then turn them into new productivity to benefit the society. In the information age, people can make full use of information technology and fully share information resources, so that the potential of human intelligence and social material resources can be fully exploited.

Smart tourism, that is, intelligent tourism, is a new proposition generated in the process of continuous development of science and technology. It is an efficient information-based tourism service mode based on cloud computing, the Internet of things and using mobile terminal online devices to actively perceive tourism information so as to realize the real-time interaction between tourists and the network. Smart tourism realizes the efficient integration of tourism resources by using information technology, so as to provide tourists with personalized and appropriate product services.

Smart education can also be called educational informatization, which is a virtual education platform established in the teaching field including teaching, management and scientific research based on computer and network technology and using digital information and network. The traditional concept, content, mode and method of education have been greatly impacted by the change of education and learning methods driven by modern information technology.

In the Convention for the Safeguarding of Intangible Cultural Heritage issued by United Nations Educational, Scientific and Cultural Organization, intangible cultural heritage refers to various practices, performances, forms of expression, knowledge systems and skills as well as related tools, objects, handicrafts and cultural sites that are regarded as their cultural heritage by various groups, teams or individuals. However, in the Law of the People's Republic of China on Intangible Cultural Heritage, intangible cultural heritage refers to various forms of traditional cultural expression that are

passed down from generation to generation and regarded as part of their cultural heritage, as well as physical objects and places related to the forms of traditional cultural expression.

2. Significance and Necessity of Protecting and Inheriting Intangible Cultural Heritage

Intangible cultural heritage, as the expression form and cultural space of various traditional cultures passed down from generation to generation and closely related to people's life, is an important part of Chinese traditional culture. It has witnessed the development of history and is a cultural resource worthy of being treasured and of great value. Intangible cultural heritage, created by people in long-term production and living practice, embodies the wisdom and crystallization of Chinese of all ethnic groups. Protecting and inheriting intangible cultural heritage is of great significance to the great rejuvenation of the Chinese nation. The diversity of world culture can be reflected through intangible cultural heritage. In addition to meeting the national development, protecting and inheriting intangible cultural heritage has also achieved the exchange of international social civilization and the sustainable development of human society. However, the survival of intangible cultural heritage has been greatly impacted by the rapid development of information technology, the strong trend of global integration, the rapid process of modernization and urbanization, as well as the great changes in cultural ecology. Nowadays, some intangible cultural heritages that can be inherited through oral and behavioral means are disappearing, inherited by oral and behavioral means are disappearing, many traditional skills are on the verge of extinction, a large number of precious objects and materials with long history and cultural value are also faced with being destroyed or lost abroad, and the phenomenon of abusing and over exploitation of intangible cultural heritage also occur. Therefore, it is necessary to strengthen the protection and inheritance of intangible cultural heritage.

3. Methods and Problems of Protecting and Inheriting Intangible Cultural Heritage

3.1. Methods of Protecting and Inheriting Intangible Cultural Heritage

3.1.1. Protection methods of archives management
It refers to strengthening the protection and inheritance of intangible cultural heritage by means of archives management in libraries and museums, that is, recording the application and approval process, relevant skills, performance props, inheritance status, inheritor information, inheritance process and achievements of intangible cultural heritage projects by means of materialized archives, so that even a certain intangible cultural heritage project extincts unfortunately, its existing imprints will be kept in the archives, and the world can know that it has existed and know its specific information.

3.1.2. Digital protection method
The technology of protecting and inheriting intangible cultural heritage is changing from traditional technology to modern digital technology. As the most practical and ideal technology in the world, digital technology is the most urgent and effective way to protect and inherit intangible cultural heritage. That is to say, various technical means, including multimedia, digital photography, virtual simulation, broadband network, three-dimensional information, are used to build a comprehensive digital system based on computer network, so as to achieve the purpose of protecting, inheriting and promoting intangible cultural heritage. Inheriting intangible cultural heritage using digital methods not only breaks through the limitation of time and space, but also realizes the effective utilization and sharing of intangible cultural heritage resources.

3.2. Problems Existing in the Protection and Inheritance of Intangible Cultural Heritage
The protection and inheritance of intangible cultural heritage are highly valued by the state. Some ways and methods are adopted and corresponding effects are obtained. However, the scope of intangible cultural heritage protection and inheritance is very large, and foreign culture and rapid development of market economy have a strong impact on Chinese traditional culture, so there are still some problems in the protection and inheritance of intangible cultural heritage.

3.2.1. Problems existing in the protection of intangible cultural heritage

Although the archives management method with library and Museum as the main body and the information digital technology can be used to protect the intangible cultural heritage, the government departments are more inclined to apply for the intangible cultural heritage in the actual operation of the intangible cultural heritage project, which pays more attention to the economic value of the intangible cultural heritage and ignores the cultural value of intangible cultural heritage. The inadequate and in-depth understanding of the value of intangible cultural heritage and the impact of foreign culture make the society less aware of the protection of intangible cultural heritage.

Although digital technology is the most effective way to protect intangible cultural heritage, it is not very mature, has a serious trend of assimilation and lack of innovation. At the same time, not all intangible cultural heritage projects are suitable for the use of digital technology. The protection of intangible cultural heritage faces the risk caused by improper use of digital and network communication technologies.

3.2.2. Problems existing in the inheritance of intangible cultural heritage

Inheritor is the most important carrier of inheriting intangible cultural heritage. However, the rapid development of information technology makes all kinds of cultures exchange and permeate each other. Many young people are more interested in elite culture but ignore traditional Chinese culture. Their interest in intangible cultural heritage is not high, let alone their willingness to inherit intangible cultural heritage. Moreover, many inheritors of intangible cultural heritage are so old that the inheritance of intangible cultural heritage is faced with a shortage of successors.

Many intangible cultural heritage projects are considered to be popular literature and art that are difficult to ascend the hall of elegance because intangible cultural heritage is produced in people's long-term production and life practice, so that many inheritors of intangible cultural heritage have a certain inferiority mentality. Influenced by the increasing age of the inheritors and their inherent conservative ideas, they stick to the conventions, dare not innovate and can not integrate new ideas and technologies when inheriting intangible cultural heritage, so that many intangible cultural heritage projects can not be well inherited and developed.

4. Ways to Protect and Inherit Intangible Cultural Heritage in the Information Age

Nowadays, in the context of the rapid development of Internet technology, it is necessary to study information technology and make full use of digital means to realize the archive management of intangible cultural heritage in order to protect and inherit intangible cultural heritage. The protection and inheritance of intangible cultural heritage should not only strengthen the application for intangible cultural heritage protection, but also need to do the following two aspects.

4.1. Intangible Cultural Heritage Tourism Based on Smart Tourism Needs to be Strengthened and the Value of Intangible Cultural Heritage Needs to be Fully Exploited

Intangible cultural heritage is diverse, and different kinds of intangible cultural heritage need different protection methods. All the methods used to protect the intangible cultural heritage need a lot of money, which is certainly not enough if only relying on the government's special funds. The integration development of culture and tourism is the current trend. The combination development of intangible cultural heritage and tourism is the inevitable choice to realize the effective protection and inheritance of intangible cultural heritage. In this context, the historical value, commercial value and cultural value of intangible cultural heritage need to be fully recognized, intangible cultural heritage resources need to be moderately developed, and intangible cultural heritage tourism needs to be vigorously developed, so that the commercial value of intangible cultural heritage is realized and its cultural heritage can be fully understood by people. Smart tourism, an important change of tourism industry, is the product of the high combination of tourism industry and modern information technology industry. Based on the further development of smart tourism and the important role of digital technology in the protection of intangible cultural heritage, the development and protection of intangible cultural heritage tourism based on smart tourism will be an important way to effectively realize the protection and inheritance of intangible cultural heritage. Modern information technology

should be fully used to collect information about intangible cultural heritage, and the digital resource base of intangible cultural heritage tourism should be established. The information network and information database of intangible cultural heritage tourism can be constructed while using the tourism digital resource database to effectively manage and utilize the intangible cultural heritage tourism resources, so that the information of food, housing, transportation, tourism, shopping and entertainment are integrated into the digital archives, and the convenience of intangible cultural heritage tourism can be improved through digital intelligent matching. In addition to excavating rich intangible cultural heritage resources, inheriting, protecting and promoting intangible cultural heritage, vigorously developing intangible cultural heritage tourism based on smart tourism can also provide financial support for the protection of intangible cultural heritage and explore an effective operation mode for the protection of intangible cultural heritage.

4.2. The Inheritance of Intangible Cultural Heritage Based on Smart Tourism in Campus Education Should be Strengthened, and the Strength of Training Inheritors of Intangible Cultural Heritage Should be Strengthened

Certain talent support is necessary to realize the continuous inheritance of intangible cultural heritage, so as to cultivate inheritors who can inherit skills. Training qualified inheritors also needs to be combined with the most popular intelligent teaching methods. It should not only strengthen the targeted training and guidance for the existing inheritors, but also strengthen the publicity of intangible cultural heritage among the young people, so as to attract the interest of the young generation in intangible cultural heritage, make them realize the importance of intangible cultural heritage, and enhance their awareness of protection and inheritance. In addition, the digital classroom of intangible cultural heritage should be constructed to promote the innovative development of intangible cultural heritage campus education by using mixed reality technology, and to realize the mixed teaching of intangible cultural heritage campus education by flexibly using digital teaching methods. In addition to improving the comprehensive cultural quality of young people and realizing the digital protection of intangible cultural heritage, using modern intelligent teaching methods such as multimedia and virtual reality to carry out the campus education of intangible cultural heritage can also cultivate a group of young inheritors with new ideas and new thoughts.

5. Conclusion

The purpose of developing intangible cultural heritage tourism and strengthening intangible cultural heritage campus education is to realize the effective protection and inheritance of intangible cultural heritage. Because realizing the brilliant vitality of intangible cultural heritage is the purpose of protecting intangible cultural heritage, rather than putting it on the shelf, intangible cultural heritage should be used and developed reasonably, so as to enrich people's spiritual culture and realize the innovative inheritance of intangible cultural heritage on the basis of protection.

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