



## Mixed Reality and Resilience in Tourism

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### Abstract

The orientation towards a resilient future for the tourism sector is paramount particularly due to the effects of the Coronavirus disease 2019 (COVID-19) global pandemic which include travel restrictions, social distancing and lockdowns. Existing technologies such as mixed reality allows individuals to see and experience the vicinity around them by blending the physical and virtual worlds but there is limited literature on mixed reality and resilience in tourism. Hence, to extend the scope of the study, this paper's main objective is to explore mixed reality and resilience in tourism and specifically to explore the relationship between the use of mixed reality and resilient future in tourism within the context of Tanzania. The adopted methodology is the literature review method using integrated literature review approach to gather relevant information to address the objective of this paper. Content analysis supplemented the literature review method. The key findings revealed that the use of mixed reality is minimal in relation to resilient future in tourism thus adding literature in the phenomenon of resilience in tourism. Hence, the conclusion is that the usage of mixed reality can enhance a resilient future towards revamping Tanzania's tourism sector. The practical implication is that the tourism practitioners should encourage the use of mixed reality in promotion efforts to ensure a resilient tourism sector.

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### 1. Introduction

Tourism has been severely affected by the Coronavirus disease 2019 (COVID-19) pandemic with reduced travel and loss of revenue as indicated in various studies and reports such as [Mkwizu \(2023\)](#); [Mkwizu and Kimeto \(2022\)](#); [Ntounis et al. \(2021\)](#); [The World Bank \(2021\)](#). Other scholars ([Setthachotsombut and Suaiam, 2020](#); [Lindsay-Smith et al., 2021](#); [Jones and Comfort, 2020](#); [Ntounis et al., 2021](#); [Zhang et al., 2023](#)) have connected resilience with tourism to study how countries are coping with the effects of the pandemic resulting from travel bans, stay home and lockdowns. The lock-down measures also caused shutdown in film and TV productions ([Rahman and Arif, 2021](#)).

The effects of COVID-19 pandemic in tourism is a global problem for all countries. Furthermore, in the UK, [Ntounis et al. \(2021\)](#) concentrated on tourism and hospitality resilience to crises and found that there were vulnerabilities for tourism-dependent businesses because of various reasons such as longer lock-down durations and demand seasonality. [Sharma et al. \(2021\)](#) urged inclusive resilience in the tourism industry to include sustainable tourism, climate action and involvement of local communities. In Africa, there are reports and a few articles that have mentioned resilience in tourism.

### How to Cite

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For example, the [African Development Bank \(2021\)](#) took the initiative to conduct a forum specifically on resilience for the African continent. On the other hand, resilience has been defined as the process and outcome of successfully adapting to difficult or challenging life experiences ([American Psychological Association, 2020](#)). In connecting the concept of resilience to tourism, other scholars such as [Siang et al. \(2021\)](#) noted resilience in tourism through the use of augmented reality mainly for virtual museum tours, and also highlighted on mixed reality. According to [Statista \(2021\)](#) mixed reality is projected to have a market size of 3.6 billion US dollars worldwide in 2025 compared to 47 million US dollars in 2017.

Mixed reality is important for the survival of the tourism stakeholders due its ability to enhance tourists' experiences in attractions especially during this phase of history where there are still travel restrictions emanating from the COVID-19 variants. Similarly, [Fadzli et al. \(2020\)](#) did state that mixed reality is a technology which supplement real-life with computer-generated data thus enabling users' interactions through natural senses that include augmented reality and virtual reality technologies. Furthermore, [Mkwizu \(2021b,a\)](#) hinted that the use of augmented reality can assist to enhance tourists' experiences including for destinations in Africa with unique tourist attractions like geoparks and national parks.

As mixed reality embraces the virtual world, [Mkwizu \(2021c\)](#) advocated for re-defining the concept of domestic tourism which can be important for the tourism stakeholders to survive by ensuring that tourism is both physical and virtual. However, given the importance of mixed reality and the need for countries to find ways to revamp their tourism sectors in a resilient manner, the purpose of this paper was to explore mixed reality and resilience in tourism guided by the Access, Better, Connect, Dis-intermediate and Educate (ABCDE) approach. Specifically, the research objective is on the relationship between the use of mixed reality and resilient future in tourism within the context of Tanzania. The significance of this paper is that the findings can be useful in guiding destination managers and tourism stakeholders in their post-covid-19 pandemic measures in building a resilient tourism industry.

## 2. Literature Review

### 2.1 Resilience in Tourism

Resilience has had several definitions in the past literature. For instance, resilience as a concept has been defined by [Windle \(2011\)](#) as the process involving effective negotiations, adaptations or managing significant sources of stress or trauma. The study by [Fullerton et al. \(2021\)](#) mentioned resilience from the process perspective of resources protecting against negative impact of stress towards positive outcomes.

The term resilience has also been extended in tourism particularly in this period of 2020 and 2021 which had both negative and positive impacts of COVID-19 pandemic. According to the tourism study by [Karunarathne et al. \(2021\)](#), resilience for a destination can focus on social and structural interactions. However, [Hudson \(2010\)](#) defined resilience as the ability of the socio-economic system to cope with disruptions, absorb exogenous and endogenous shocks and adjust organization, form change through continuous creativity and learning.

Equally, [Orchiston et al. \(2016\)](#) defined resilience as the ability of a system to maintain its identity and adapt its essential structure and function in the face of disturbance. [Fabry and Zegni \(2019\)](#) added that linking resilience and tourism is significant due to disturbances. Therefore, in this paper, resilience is referred to as the ability of a tourism destination to cope with disruptions and adjust its tourism activities, products and services in order to enhance tourists' experiences using technologies such as mixed reality.

### 2.2 Mixed Reality

Mixed Reality (MR) is simply referred to as the possibility of the user to interact with contents ([Debandi et al., 2018](#)). The interaction is possible through MR applications that enhance the users experience during cultural tours when the synthetic contents are anchored in positions of real space ([Debandi et al., 2018](#)). The concept of MR is also considered as one of the branches of virtual reality ([Zakhariv et al., 2020](#)).

Other scholars ([Fadzli et al., 2020](#)) have defined MR as a technology that supplement real-life with computer-generated data to enable users to interact through natural senses that include augmented reality and virtual reality technologies. [Qui et al. \(2020\)](#) added that MR is defined as the field of human and computer interactions involving the superposition of virtual reality graphs that makes it possible for the user to interact with the virtual world tangibly. This paper adopts the definition of MR by [Fadzli et al. \(2020\)](#).

### 2.3 The ABCDE approach

In [Permatasari et al. \(2020\)](#), the Access, Better, Connect, Dis-intermediate and Educate (ABCDE) approach as mentioned by [Cantoni \(2018\)](#) are the five main areas that can be used as Information Communication Technologies (ICTs) roles in promoting sustainable tourism and preservation of cultural heritage. According to [Cantoni \(2018\)](#), access simply means access to information and raise awareness while better is using digital communication such as mobile to enrich the tourists' experiences. Connect is the act of connecting local stakeholders to heritage ([Cantoni, 2018](#)) whereas dis-intermediate is about information distribution, communication support and promotional activities ([Davida and Cantoni \(2015\)](#)).

The educate approach refers to training and education activities to relevant stakeholders through means like digital archives or MOOCs (Cantoni, 2018). Past studies like Miralbell et al. (2014) mentioned that e-learning can increase the interest and motivation of tourism employers and employees in the tourism sector. Further emphasis was made by Villarejo et al. (2014) with findings indicating that the use of augmented reality in cultural heritage studies is useful from a pedagogical and technological perspectives. Additionally, Sharma (2020) contributed literature on pedagogy and self-directed learning using the virtual world. Moreover, other scholars have also contributed knowledge on virtual world by designing and implementing virtual reality applications as well as virtual reality glasses in language learning (Akaslan, 2020; Akaslan et al., 2020). Hence, previous studies such as Iglesias (2014); Kalbaska (2014); Miralbell et al. (2014); Villarejo et al. (2014) complement the educate element of ABCDE approach in educating and training tourism stakeholders.

ICTs have technologies and Fadzli et al. (2020) defined MR as a technology that supplement real-life with computer-generated data to enable users to interact through natural senses that include augmented reality and virtual reality technologies. The ABCDE approach has been stated in tourism studies including the research by Permatasari et al. (2020). Moreover, Permatasari et al. (2020) found that even though mobile apps are used in Indonesia include information on cultural heritage, the inscription and other relevant information on UNESCO World Heritage Sites (WHS) are less mentioned. Therefore, this paper adopts the ABCDE approach to guide in exploring mixed reality and resilience in tourism.

#### 2.4 Mixed reality and resilience in tourism

In general, studies on resilience in tourism exist on a global level and these include Buultjens et al. (2017); Karunarathne et al. (2021); Noorashid and Chin (2021); Sharma et al. (2021); Lai and Cai (2023). For example, in Sri Lanka, Karunarathne et al. (2021) found that defensive measures such as visa extension without any excess payments were applied during the pandemic as a resilient mechanism. Another example is in India, Suneeth et al. (2021) mentioned that resilient tourism policy and practices are mitigation measures in the tourism education system. While Karunarathne et al. (2021); Suneeth et al. (2021) covered tourism resilience in terms of tourism operations and education, other scholars focused on mixed reality. For instance, Ntounis et al. (2021) applied mixed-method approach of quantitative and qualitative to study urban resilience in English towns of the UK with findings indicating that tourism-dependent businesses were vulnerable in the COVID-19 pandemic owing to longer lock-down durations and also uncertainty in the time frames for reopening.

With the projection of high market size for MR indicated by Statista (2021); Debandi et al. (2018) examined MR by focusing on cultural tourism using MR applications. Debandi et al. (2018) found that users of MR during cultural tours can select objects such as buildings and also allow the user to interact with augmented contents displayed in the video or text audio. In the Africa context, the African Development Bank (2021) had a forum on resilience for Africa and the concern was on COVID-19 and beyond particularly to work together by sharing experiences and lessons learned in order to build lasting resilience in the continent. Subsequently, for example in Kenya there were virtual safaris during the COVID-19 to virtual travelers (Africa Renewal, 2020) even Tanzania had virtual tours.

Conversely, in Tanzania the emphasis has been on responsible tourism during the pandemic as indicated in the study by Trade for Development News (2020). Furthermore, Tanzania was not on lock-down however, the effects of the pandemic was felt in fresh graduates that could enter the labor market in the tourism sector (Trade for Development News, 2020). The report by The World Bank (2021) stated that Tanzania's tourism to recovery includes creating a reliable business environment, the establishment of information management systems, accessibility to finance, promoting safety protocols and investment to support nature-based landscape and seascape management. In efforts towards resilience, Tanzania teamed up with other East African states and successfully hosted the first East Africa Regional Tourism Expo (EARTE) aiming to promote resilient tourism for inclusive socio-economic development (East African Community (EAC), 2021).

Additionally, The World Bank (2021) mentioned that the focus of resilience is on destination planning and management, product diversification, inclusion of local value chains, improved business and investment climate and new business models based on partnership and shared value creation. Past studies have concentrated on resilience in terms of climate and economy and this is evident in the paper by Greene (2015); Zhang et al. (2023). However, there are scant studies that connect mixed reality and resilience in tourism in the context of Tanzania. The effects of COVID-19 pandemic on the tourism sector is a huge problem and demand more research on how countries can forge a resilience path. Therefore, this paper extends the literature on resilience in tourism by exploring mixed reality and resilience in tourism in Tanzania.

### 3. Materials and Methods

This study applied a literature review method and specifically the integrated literature review approach for purposes of gathering relevant information on mixed reality and resilience in tourism.



The literature review approach involves using books, journals, reports and conference papers with relevant information on mixed reality and resilience in tourism. Subsequently, content analysis was adopted to further the analysis of the specific research objective on the relationship between the use of mixed reality and resilient future in tourism within the context of Tanzania. Previous scholars (Cheng et al., 2016; Mkwizu, 2020; Mkwizu and Kimeto, 2022) have also applied the use of integrated literature review approach with content analysis. Additionally, content analysis has been applied in tourism research (Camprubi and Coromina, 2016). Subsequently, Chen et al. (2020) investigated Chinese news coverage on COVID-19 and tourism using content analysis.

The popularity of content analysis in research extend beyond tourism to other fields of study such as organization (Duriau et al., 2007) and nutrition education (Kondracki et al., 2002). Cheng et al. (2016) used a trio methodology approach which included content analysis and integrated review and found that there was under-representation of non-Western tourists in the Western geographical context. Mixing method approaches is a methodology phenomenon used in tourism and other fields such as finance. For instance, Dewasiri et al. (2018) highlighted on mixed-method approaches in research related to finance. Although the study by Dewasiri et al. (2018) focused on finance research, other fields such as tourism can and have applied mixed-method research approach.

#### 4. Findings and Discussion

From the existing literature, the findings revealed that the use of mixed reality is minimum in relation to resilient future in tourism for Tanzania. Majority of the literature focused on resilience measures in terms of "responsible tourism", "destination planning and management", "product diversification", "inclusion of local value chains", "improved business and investment climate", "new business models based on partnership", "shared value creation" and "having EXPOs". There is less on the issue of mixed reality usage in tourism as a measure for resilience in tourism in Tanzania as summarized in Table 1.

The various reports such as The World Bank (2021); African Development Bank (2021); East African Community (EAC) (2021) have highlighted on resilience measures like responsible tourism, destination planning and management, product diversification, inclusion of local value chains and having EXPOs. The forum conducted by African Development Bank (2021) serves to build resilience for the African continent including Tanzania. This implies that there are various options that have been suggested as measures of resilience in tourism for Tanzania.

**Table 1.** Use of mixed reality and resilient future in tourism

Literature Review	Author(s)	Year
Responsible tourism during the pandemic	Trade for Development News	2020
Destination planning and management	World Bank	2021
Product diversification		
Inclusion of local value chains		
Improved business and investment climate		
New business models based on partnership	East African Community	2021
Shared value creation		
Having EXPOs		

However, the findings of this paper reveal that although mixed reality is projected by Statista (2021) to have huge market size worldwide, there is still little mention of mixed reality usage and resilient future in tourism in the context of Tanzania. This can further imply that the use of mixed reality is minimum in relation to resilient future in tourism. Conversely, studies by Siang et al. (2021) mentioned of mixed reality in tourism but this was confined to museums in cultural and heritage sites. Tanzania is endowed with unique tourism attractions and therefore, mixed reality can be used in museums but extend to other attractions such as national parks. Cantoni (2018) added that ICTs role in promoting sustainable tourism and cultural heritage is hinged in Access, Better, Connect, Dis-intermediate and Educate (ABCDE) approach. As countries are looking for ways to enhance tourists' experiences, the ABCDE approach can be handy particularly in the post COVID-19 pandemic as a measure to revive the tourism sector.

ICTs such as mixed reality technologies have the capacity to enhance tourists' experiences as indicated by Cantoni (2018). Hence, the practical implication from this paper's findings is that given the positive projections of mixed reality market size in 2025 and the ability of mixed reality technologies to enhance tourists' experiences, the managers and tourism stakeholders in Tanzania should begin to embrace and invest in mixed reality usage for resilience in tourism. Furthermore, as mixed reality comprises augmented reality and virtual reality, studies such as (Iglesias, 2014; Kalbaska, 2014; Miralbell et al., 2014; Villarejo et al., 2014) emphasized on the need to educate and train employers and employees in the tourism sector. This implies that countries such as Tanzania when investing in the use of mixed reality for a resilient tourism should embark on educating and training the tourism stakeholders on mixed reality.

## 5. Conclusion

The aim of this paper was to explore mixed reality and resilience in tourism. In addition, the specific objective was to explore the relationship between the use of mixed reality and resilient future in tourism in the context of Tanzania. The key findings revealed that the literature on mixed reality and resilience in tourism in the context of Tanzania is limited.

Furthermore, the use of mixed reality is minimal in relation to resilient future in tourism. Most of the literature concentrated on resilience issues related to "responsible tourism", "destination planning and management", "product diversification", "inclusion of local value chains", "improved business and investment climate", "new business models based on partnership", "shared value creation" and "having EXPOs".

In exploring mixed reality and resilience in tourism in the context of Tanzania, this study contributes literature in the phenomenon of resilience in tourism. Furthermore, the application of mixed reality can enhance a resilient future towards revamping Tanzania's tourism sector. The use of mixed reality can assist to enhance the access, better, connect, dis-intermediate and educate as an ABCDE approach in building a resilient tourism that enhances tourists' experiences.

The implication for practitioners is that it is essential to encourage the use of mixed reality in promotion efforts to ensure a resilient tourism sector. Moreover, this also implies that investment in the use of mixed reality for a resilient future in tourism should go hand in hand with educating and training the tourism stakeholders on mixed reality and its respective technologies. This study was limited to literature review approach and content analysis as methodological approaches in exploring mixed reality and resilience in tourism in the context of Tanzania.

Hence, future studies can explore mixed reality and resilience in tourism using mixed methods of quantitative and qualitative to further understand resilience in tourism in the post COVID-19 pandemic.

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