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TECHNICAL REPORT



An application of the virtual reality 360° concept to the Great Zimbabwe monument

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ABSTRACT

This paper is an application of the virtual reality 360° concept to the Great Zimbabwe monument to produce virtual tour videos of this world-scale heritage site. The paper was prompted by the need to make this tourist magnet accessible to the physically challenged, and those constrained by finance, distance and time. It was also prompted by the need to better inform and educate guests about the monument and possibly increase visitation as several studies have showed that three-dimensional virtual tours may increase actual intention to visit. To produce the virtual videos, spherical images of the monument were first shot with a 360° camera and then stitched in Kolor Autopano software to get high-resolution images. The virtual tour videos are expected to be uploaded on a server for access by the entire world on computers, tablets and smartphones for a fee. The videos allow patrons to navigate the monument's key archeological sites, such as the Great Enclosure and the Valley Ruins, as well as listen to highly educational and informative commentaries. As this project is the first of its kind in Zimbabwe, this paper suggests that follow-up research on the videos should be undertaken to establish their impact.

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Introduction

Globally, tourism activities have become indispensable necessities of our lives. Travel has become an imperative and a human rights issue, and tourism is expected to be accessible to all (Özogul & Baran, 2016; Yau, McKercher, & Packer, 2004). This understanding has led to the concept of accessible tourism for all. Guerra, Pinto, and Beato (2015) view it as tourism that endeavours to ensure that tourist destinations, products and services are accessible to all people, regardless of their physical limitations, disabilities or age. This type of tourism therefore also calls for the elimination of all obstacles and barriers to the accessibility and enjoyment of all tourism products and services, including transportation and other related facilities (UN Convention on the Rights of Persons with Disabilities, 2006).

Archaeological sites and monuments are some of the most significant tourist attractions in the world today. Some of these monuments such as the Egyptian Pyramids, the Great Wall of China, and many more are grand and extensive, and therefore present serious accessibility challenges to people with limited mobility. This problem is compounded by the fact that these archeological sites and monuments, by nature, do not allow major alterations to their structure, to the effect that any interventions should be made sensitively and carefully to preserve the sites' authenticity, originality and heritage integrity (Naniopoulos & Tsalis, 2015). To other potential tourists, these attractions are inaccessible due to issues of finance, distance and time. Nevertheless, and in the spirit

of tourism for all, these barriers need to be overcome, and one of the best ways is with technology and the creation of virtual tours.

This paper is an application of the virtual tour concept at the Great Zimbabwe monument undertaken to produce a highly interactive virtual tour of the site. Empathy for those with limited mobility, including people with physical disabilities, the sick, the frail and the elderly who, on numerous occasions, were left in the valley floor while other visitors toured the hill complex for almost two hours, prompted this study and technology application. The need to better inform and educate guests about the monument and possibly increase visitation further prompted the project, since other studies have demonstrated that three-dimensional virtual tours increase actual intention to visit (Griffin et al., 2017; Rueda-Esteban, 2019; Thomas & Carey, 2005). The project is the first of its kind in Zimbabwe.

The concept and literature review

There is no consensus as to the origins of the virtual tour concept, but there is general agreement that the concept is a recent development in video production. In fact, the whole concept of virtual reality is most commonly traced back to June 1994 and is believed to have been coined when Queen Elizabeth II opened a visitor centre where her officials were asked for a 'virtual reality' of the centre before the actual 'royal tour' (Lukesh, 1995). A fusion of these two terms hence produced the 'virtual tour' concept.

In tourism, a virtual tour is a simulation of an existing location, usually composed of a sequence of videos or still images. It may also use other multimedia elements such as sound effects, music, narration, and text (Urriza, Ferrer, Dizer, & Red, 2016; Vince, 2004). Existing literature suggests that the underlying concept behind the creation of virtual tours is the ability to stitch photographs seamlessly at very fast speeds of up to 25 photos per second to the effect that the stitched images become one continuous movement. This way, virtual tours can thus be photograph- or video-based. There are various ways in which the photographs can be stitched to produce virtual tours, including the cubical, the rectilinear, the one-shot optics and the spherical stitching with the last being the latest (Lukesh, 1995; Perdana, Irawan, & Munadi, 2019). Video-based tours have come in with the advent of video cameras. However, several factors militate against the use of video cameras to produce virtual tours, including the fact that the videos produced almost always eliminate viewer control. They also require highly proficient video editors and demand more sophisticated computer software and hardware. Therefore, today, specialised cameras such as the latest GoPro Fusion camera with the ability to shoot 360° have been developed to overcome these challenges. This is the camera used for this project. The images and videos from these cameras are then uploaded onto computers with software packages such as the Kolor Autopano, which are capable of stitching the photographs and producing highly interactive virtual tours.

The literature reveals that hotels have been, and still are currently, the most extensive users of the virtual tour concept within the tourism and hospitality industry (Adamson, 2015). As an example, the Marriot Group of hotels has turned virtual tours into a significant marketing tool for its hotels, and it is being used to increase average room occupancy levels by providing online viewers with highly impactful and immersive views of the hotel property, including its environs and amenities (eMarketer, 2015). The main advantages of virtual tours over other promotional tools include their ability to bring clients closer to reality and the fact that they are web-based and hence can be accessed from almost anywhere in the world through smartphones, computers and tablets. This project applies this concept to monuments with a view to making them accessible to those with limited mobility and physical disabilities who cannot physically tour such sites.

The merits and drawbacks of heritage site virtual tour videos

Heritage conservation

The list of heritage sites and objects that can be accessed virtually is constantly expanding, and already one wonders why a heritage site such as Great Zimbabwe, which is the second largest

monument in Africa after the Egyptian Pyramids, is not on this list. Maybe it is there but it is certainly not available on the public domain. Examples of monuments on this list include the Hagia Sophia Mosque of Istanbul, the Great Buddha carvings in Afghanistan, and the Sarajevo City Hall (Guttentag, 2010). The number of tourists physically visiting these monuments daily and annually sometimes runs into millions, and the negative footprints they leave on these monuments can be shockingly high. In most cases, these impacts are slow and imperceptible, and their full force may be realised too late. As an example, Watson (2008) cites the erosion of temple stones caused by multitudes of tourists walking through Cambodia's Angkor temples and touching the carvings therein. Rapid tourism development can lead to rapid wear and tear at such monuments and a loss of authenticity as continuous restorations are effected. Under such circumstances, virtual tour videos could provide an alternative form of access to threatened heritage sites and hence act as a significant tool to heritage conservation (Bohlin & Brandt, 2014).

Promotion of accessible tourism for all

There is a paucity of literature on the use of virtual technology and virtual tours to promote accessible tourism for all. A thematic analysis of 48 closely related articles on the use of virtual tours reveals that academic writing to date has focused on four main areas (Table 1).

As shown in Table 1, none of the articles reviewed focused on virtual tours as tools for promoting accessible tourism for those with limited mobility. Most of the writings have also been commentaries on existing virtual tour videos and have hence turned out to be too theoretical with no tangible output. This research brings in this practical dimension by actually producing a virtual tour for which follow-up studies can be made along all the themes highlighted in the table. The virtual video produced from this research and applied project makes it possible for people from all walks of life, to tour the Great Zimbabwe monument, an attraction which some could otherwise never visit. Virtual visitors include those with physical disabilities and those constrained by finance, distance and time. As noted by Huh and Singh (2007) and Poria, Reichel, and Brandt (2009), people with disabilities who travel, or would like to travel, comprise quite a significant and yet often neglected market segment. These people face a barrage of almost impossible barriers to participate in tourism-related

Table 1. Key thematic areas for 48 journal articles on virtual tourism.

Thematic area	No. of journals	Journal articles
1. Tourist attitudes towards virtual tours	5	Huang, Backman, Backman, and Moore (2013), Jung, Chung, and Leue (2015), Tussyadiah, Wang, and Jia (2017), Wu (1999) and Sahli and Legoharel (2016)
2. The impact of virtual and augmented reality on visitor experiences	11	Jung, tom Dieck, Lee, and Chung (2016), Carrozzino and Bergamasco (2010), Jacobious (2016), Javornik (2016), Neuhofer, Buhalis, and Ladkin (2014), Penfold (2009), Hobson and Williams (2014), Tussyadiah (2014), Tussyadiah et al. (2017), Lin (2010) and Mascho and Singh (2014)
3. Virtual tours and their effectiveness as a marketing tool	27	Yim, Chu, and Sauer (2017), Yung and Khoo-Lattimore (2019), Wan, Tsaur, Chiu, and Chiou (2007), Wiltshier and Clarke (2015), Williams (2006), Williams and Hobson (1995), Huang, Backman, Backman, and Chang (2016), Adamson (2015), Guerra et al. (2015), Roughead (2017), Barnes (2016), Van Kerrebroeck, Brengman, and Willems (2017), Griffin et al. (2017), Hyun and O'Keefe (2012), Marasco, Buonincontri, van Niekerk, Orłowski, and Okumus (2018), Berger et al. (2007), Anglim (2016), Buhalis (2000), Buhalis and Law (2008), Cruz-Neira, Sandin, Defanti, Kenyon, and Hart (1994), Gratzner, Werthner, and Winiwarter (2004), Gretzel and Fesenmaier (2003), Han, Jung, and Gibson (2013), Stamboulis and Skayannis (2003) and Sherman and Craig (2003).
4. The impact of virtual tours and reality on tourist decision making and visitation levels	7	Wang and Hsu (2010), Cheong (1995), Suh and Lee (2005), Ku and Chen (2015), Sussmann and Vanhegan (2000), Chung, Han, and Joun (2015) and Levere (2017).

activities including visiting unaccommodating architecture and landscapes (Özogul & Baran, 2016). On the supply side, a tourist site may also be too remote, too expensive, too inhospitable, too dangerous, too fragile or nearly extinct, and hence virtual tour videos could make such sites accessible (Paquet & Viktor, 2010).

Increase in intention to visit

There has been a lot of debate in the literature as to whether virtual tours can actually increase or decrease visitation levels. However, successive studies are increasingly pointing to the fact that such videos can actually increase people's intention to visit the real destinations and sites (Buhalis & Law, 2008; Christofi et al., 2018; Refsland, Ojika, Addison, & Stone, 2000). As an example, Thomas and Carey (2005) established that even visiting a museum's website actually increased people's interest in visiting the real museum. In another example, the British Broadcasting Corporation (BBC, 2017) reported that in a video marketing Wales Wildlife Trust attractions, 85% of the people who had watched the video confirmed that they would actually visit the wildlife attractions. For the Great Zimbabwe virtual experience, it would be interesting to ascertain the impact of this video on actual visitation levels, especially given that virtual tour videos cannot substitute for in-person experiences at tourist destinations and sites. In the words of Paquet and Viktor (2010, p. 1), 'most people want to see reality and not virtuality'

Marketing heritage sites and other tourist attractions

As already illustrated, marketing is the area of focus of most research on virtual reality. In 1995, Williams and Hobson accurately observed that, virtual tourism had the potential to revolutionise the promotion and selling of tourism products by providing extensive levels of sensory information to potential tourists. This revolution is increasingly being witnessed today and will continue to be witnessed into the foreseeable future. With these videos, the reach and tangibility of tourist destinations and sites is increased. Potential customers are given an opportunity to 'try before they visit destinations' and hence can build more realistic mental impressions of what they will expect when they visit these localities Levere (2017) and attractions. Other authors, such as Wan et al. (2007), found that virtual experiences provided more effective advertising than brochures for both theme parks and natural parks. Today, many towns and cities use virtual tour technology to market themselves. Lisbon, Portugal, and Cape Town, South Africa, are good examples. Virtual tour video platforms may also be used to market other tourist destinations and attractions through prefixing audio and video advertisements and snippets of other attractions. Others are using the videos to showcase their products at travel expositions and other marketing fora. The video of the Great Zimbabwe Monument to be produced from this research will also be used for this purpose.

Increased revenue generation for heritage sites

Revenue is one area that has not been explored by extant literature on virtual heritage, yet there are several ways in which virtual tour videos can directly generate revenue. First, virtual video visitors worldwide can be charged an access fee every time they wish to experience the virtual tour. Second, that virtual tour videos also make tourist attractions accessible to the socially disadvantaged and people with physical disabilities also implies that extra revenue can be generated from this expanded market. Revenue could also be generated through the use of virtual tour video platforms for children's video games (Zyda, 2005). Such videos could become more popular as they bring some aspect of realism into the games. In this case the popularity of the video game would be proportional to the popularity of the tourist site where it is hosted. In the case of Great Zimbabwe, a reincarnation of the tribal wars within the monument's corridors could attract much attention. The issue of revenue generation from virtual tour videos is not documented well in existing literature, possibly because such heritage virtual videos where an access fee is charged are limited.

Eduainment

Interactive virtual tours are increasingly becoming important educational and entertainment tools for schools and colleges worldwide. In relation to edutainment trips, the use of virtual tour videos as an alternative to actual trips could guarantee student safety, as chances of students getting hurt while on a trip physically impossible. Features not common to the student's geographic regions are also exposed. Students' financial constraints and distance and time barriers are also overcome. Students can also navigate and learn about attractions at any place and time, especially if such videos are accessible from their smart phones and iPads. On the other hand, virtual tour videos could also deny students an opportunity to more actively participate in the tour through increased abstraction. In the travel industry, especially on long-haul flights, such videos could also edutain passengers. The same applies to luxury coaches and other modes of transport. Virtual tour videos can be placed at theme parks and in the museums of relevant sites for those who might not be willing or who are unable to undertake the physical tour for one reason or another.

Content consumption levels of virtual tours

The levels of visitation by both actual and potential demand have been overwhelming where virtual tours have been introduced as a marketing tool (Liu, 2005; Marasco et al., 2018; Mascho & Singh, 2014). Inter-alia, its globalised accessibility and attention-grabbing qualities have contributed immensely to these high visitation levels. As an example, research in the early 2000s revealed that more than 5 million Americans watched virtual tours every day. In addition, one study discovered that the number of Americans watching virtual tours increased by 33% from 54 million in 2004 to 72 million in 2006 (Guerra et al., 2015). With the recent explosion of information hubs and platforms, the consumption of virtual tour content can only increase globally both in the immediate and long term future.

There is voluminous literature on the origins of Great Zimbabwe. This is not surprising since it is an attraction of both continental and global significance. However, while the history and origins of the monument have received much attention in academic writing, with only a few notable exceptions (e.g. Gurira & Ngulube, 2016; Macheke, 2016; Manwa, 2018), the tourism component has been largely neglected. There is need to accentuate this dimension since, for tourism today, culture and heritage visits are increasingly taking centre stage. The only significant writing aligned to this and virtual experiences is the paper by Maforo (2013), but the main purpose of the application of the virtual concept of Maforo's study was to restore the deformed sections of the Great Enclosure. Texture maps rather than virtual tour videos were the output of Maforo's research.

Methodology

A single case study design was adopted for the study in which Great Zimbabwe was the study unit. The decision to adopt the case study design was also taken following Saunders' (2009) observation that case studies are useful for testing the applicability of concepts, theories and models to the real world. The design also allowed the author to engage various forms of triangulation, especially in relation to the research team, the research participants and data analysis in preparation for the video project. This design also allowed detailed information about the monument to be gathered through.

Brief history and description of the study unit

The study unit was the Great Zimbabwe monument. This monument is a recognised UNESCO World Heritage Site and is one of the most significant and largest monuments in the world today. Its importance for Zimbabwe and Sub-Saharan Africa is comparable to the Great Wall of China, the Pyramids of Egypt, and Machu Picchu, Peru. In southern Africa, it is also the largest

pre-historical monument in terms of size. According to an age-old legend, Great Zimbabwe used to be the capital of the Queen of Sheba. The monument is an eleventh–fifteen century city located approximately 30 km from the town of Masvingo close to Mutirikwe Dam. It is in a sparsely populated area occupied today by a splinter group of the Bantu people called the Shona. The monument covers an area of about 800 hectares and is divided into three key sections: the Hill Complex, the Great Enclosure and the Valley Complex (Ndoro, 1994). Figures 1–3 show some of the monument's key sections.

As shown in Figure 1, the Hill Complex refers to the stone works atop a granite spur aligned in a northeast-southwest direction and has been confirmed by archeologists as the oldest section of the monument. These stone works consist of the East and West Enclosures. The East Enclosure contains six stone sculptors of the Zimbabwe Bird and is believed to have been the place for ritual purposes and for spirituality and worship. The West Enclosure is thought to have been the residences of successive chiefs.

Figure 2 shows the Great Enclosure, which consists of a large walled elliptical construction to the South of the Hill Complex. The heights of the walls vary but go up to 11 m. The key features within this Great Enclosure include the daga-hut living quarters, a community area and a narrow passage leading to a high conical tower. The Valley Complex (Figure 3) consists of stone works that incorporate an impressive display of chevron and chequered walls scattered in the valley of the Hill Complex, mostly on the eastern side of the Great Enclosure.

Archeological work shows that Great Zimbabwe was built between the 11th and the 14th centuries. Its estimated population at that time is believed to have been between 10,000 and 18,000 people (Chirikure & Pikirayi, 2008). Sporadic tribal wars and protection from other enemies were the main reasons why the monument was built, as well as spirituality and worship. Goods traded with the outside world were also stored within the monument. Archeological excavations have revealed glass beads and porcelain from China and Persia, and gold and Arab coins from Kilwa, Tanzania (Huffman & Vogel, 1991). A monumental cross discovered at a traditionally revered and sacred spiritual site also illustrates community engagement with early missionaries.



Figure 1. Part of the Hill Complex.



Figure 2. Part of the Great Enclosure.

The National Museums and Monuments of Zimbabwe (NMMZ) is responsible for managing this property with assistance from the NMMZ Board of Trustees. Funding for management and conservation comes mainly from the central government, with additional income being generated from entrance fees, accommodation charges, and sales of publications. Given the economic crisis Zimbabwe has faced in the last two decades, funding has been a serious challenge – hence the creation



Figure 3. The Valley Complex.

of this pre-paid virtual tour video to alleviate the situation. If well patronised by interested parties, conservationists and other clients, the funds from this project could be used to produce an integrated management plan, with adequate levels of community participation to mitigate the progressive deterioration of the historic fabric and ensure its long-term conservation.

In terms of its heritage value and tourism interest, the actual wonder in the monument is the lack of mortar and the height of the walls. One wonders how these ancient people managed to leverage the huge blocks of granite to those heights. The artistic creations of the Zimbabwe Bird and the general architectural design of the monuments are also a marvel and a wonder. The Great Enclosure exhibits the monument's greatest assets and workmanship. This feature is 255 in circumference, 11 m high in other areas, and 5–6 m wide. An estimate of around 15,000 tons of granite stone blocks was used to build its outer wall; it is thus the biggest single pre-historic structure south of the Sahara. The chevron pattern, drainage holes and the conical tower also bestow the monument builders' advanced engineering skills.

In terms of visitation, the monument receives an average of 57,000–58,000 visitors per year and generates about USD \$200,000–300,000 annually. A two-tier pricing system is employed for charging entrance fees with local resident adults and their children paying USD \$5 and USD \$3 respectively, while all foreigners pay USD \$15 and foreign children USD \$8. Interviews and secondary data provided by the marketing officer at the monument revealed that Zimbabwe, South Africa, Germany, USA, Japan and Australia were the dominant visitor source countries. Domestically, organised tour groups contributed almost 75% and individuals 25% of the visitors to the monument. The dominant organised groups were schools (50%), companies (20%) and churches (5%).

A complete tour of Great Zimbabwe usually takes an average of 2–2.5 h, with key places of interest being the Hill Complex, Great Enclosure, Shona Village, Site Museum and Valley Enclosures. It also involves visitors ascending 150 m up to the Hill Complex apex at steep gradients of up to 45%. The tours are exciting and insightful but exhilarating and exhausting. After going through the tour, one of the guests had this to say: 'I am so exhausted. It was more like mountain hiking'. Most of the Hill Complex sides are inaccessible, and there is also a mysterious tunnel that is sealed and into which entering is prohibited. Wall climbing is also prohibited at the monument. The monument is Zimbabwe's second most visited tourist attraction after Victoria Falls. The Shona Village has become a resource centre for heritage studies. The aesthetic values of the Great Zimbabwe monument have made it the icon of the nation. The success of tours at Great Zimbabwe has also opened an adventure of diversified business such as hotels, lodges, craft centres and cultural villages.

In terms of accessibility and accessible tourism for all, Great Zimbabwe is inaccessible to several groups of people, including those with lower torso disabilities, the physically frail and elderly, and those who cannot tour the monument because they are time poor and/or financially constrained. For some, the geographical distance from the monument is a barrier. This means that Great Zimbabwe has a lot of latent local and foreign visitors who need better access to be able to contribute to the World Tourism Organization's (UNWTO) vision of 'tourism for all' by the year 2030. Accessibility could be increased through the adoption of technology and the creation of virtual tours using the 360° camera concept. Such a creation is in line with the UNWTO's Tourism Day theme in 2018, which was, 'Tourism and Digital Transformation' (UNWTO Bulletin, 2018). This paper and the rest of the write-up demonstrate how this concept was applied to the Great Zimbabwe monument to produce and market a virtual tour video of the attraction.

In general, one can say that Great Zimbabwe is a unique architectural structure that bears testimony to paradigm shifts in the civilisation of the Shona people of Zimbabwe. Its authenticity is unquestionable, and today the entire nation of Zimbabwe identifies with the monument and has adopted the Steatite Bird as its emblem. The bird is today called the Zimbabwe Bird and might have been a royal totem during the monument's heyday.

Data collection/video production

In relation to the actual data collection process, clearance to produce the video was first sought and granted by the National Museums and Monuments of Zimbabwe (NMMZ) agency. Thereafter, a reconnaissance trip was undertaken to produce a grid map of the area. This was followed by another trip to record the video. A triangulation of researchers was adopted as it required expertise in the fields of information technology, video production, archeology and tourism. At the monument site, the best and most experienced tour guide and the monument's marketing officer and educational officer were taken as key informants for the research. In-depth interviews were undertaken with the monument's marketing and educational officers, while the tour guide provided the voice-over for the video. Visitor records and the monument's pamphlets were the sources of secondary data at the site. The latest GoPro Fusion camera with the ability to shoot 360° panoramic footage was the main 'research' instrument. In ordinary terms, this is a camera that can shoot both horizontally and vertically. The camera has two lenses and a video resolution of 18 megapixels. Its video resolution is 5.2 K @30fps. Before recording, an application was installed on a smartphone to access the camera and hence enable controlling it remotely. The camera was also paired via Bluetooth as back up to this application. The camera was then used to record the tour of the attraction. Videos and multiple photo shots were also taken; the whole recording lasted six hours. In the process of producing the virtual tour video, the photos and videos were downloaded at the studio. These were then stitched on a computer using Kolor Autopano, a popular image-stitching software that was used to create 360° immersive videos. The voice-over had already been done at the monument by the most experienced tour guide there.

Results and discussion

This project resulted in the production of four virtual tour videos of Great Zimbabwe's key sections. To navigate the key attractions and to rotate 360°, virtual visitors have to continuously down-press the left mouse computer button and drag it in any direction while the videos are playing and the commentaries are voiced. This viewer interactivity is a unique aspect of these videos which most normal videos do not possess.

The target market for this video includes the readers of this journal article, travel transport providers for passenger entertainment, latent travellers, schools and educational institutions, online libraries, television channels, such as the National Geographic, and the general public through their smartphones and personal computers. Further market development could be through online video games on the platform. The videos could be promoted through media advertisements, press conferences, personal selling and direct marketing through computer online shopping.

As illustrated in the literature review and especially in [Table 1](#), it is quite difficult to engage in further discussions on these video productions, as their effects on the readership and on virtual guests are yet to be known. As of now, it may be critical to focus on how best the videos can be marketed and accessed by the target markets. After the video has been reasonably accessed, further research and discussions can then be carried out to reveal its effectiveness as a marketing tool, its impact on visitation levels to the monument, virtual tour guest attitudes towards the video, and other relevant questions. Guest comments after experiencing the virtual tours will therefore be the major data source for these subsequent studies. The findings from this applied project could then be used to support or refute current findings on the use of virtual tours in tourism.

Directions for further research

Since this video is the first of its kind in Zimbabwe, it would be interesting to learn how it will perform in terms of its ability to promote tourism for all, its educational validity, its ability to increase visitation and general tourist attitudes towards it. Studies of this nature will be undertaken once the

video is made available on public platforms. The video link to the video production described in this paper will be activated for public viewing in 2020.

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Disclosure statement

No potential conflict of interest was reported by the author.

Notes on contributor

Cleopas Njerekai is a vastly experienced lecturer and practitioner in tourism and hospitality management in Southern Africa. He has taught more than 30 tourism and hospitality management modules at different universities in Zimbabwe and in the diaspora. He graduated the first 72 Mozambicans with an English taught tourism and hospitality management degree in 2009. He introduced the Masters Degree program in Tourism and Hospitality Management at the Midlands State University in 2010 and also founded and introduced the Hospitality Management Degree at Botho University in Botswana in 2013. Mr Njerekai has been the Principal Administrative Officer for the Ministry of Environment and Tourism in Zimbabwe and also Industrial Liaison Officer for the University of Zimbabwe's Faculty of Commerce. He holds four (4) university qualifications from the University of Zimbabwe including a Master of Science in Tourism & Hospitality Management, a Bachelor of Arts General degree, a Bachelor of Arts Honours degree in Geography and a Graduate Certificate in Education. He is currently a final year PhD student with the Midlands State University in Zimbabwe. To date, Mr Njerekai has written and published 2 books, 4 book chapters and 10 journal articles in tourism and hospitality management and has also made presentations at several national and international fora including the Africa Travel Association (ATA).

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