**Mansoura University**
**Faculty of Tourism and Hotels**

# The Influence of Experiential Value of Augmented Reality Technology on Destination Visit Intention: Evidence from A Multi-Mediation Model

***By***

**Dr/ Rania Magdi Orabi**

Department of Tourism Studies
High institute of tourism, Hotel Management and Monuments Restoration, Abou Qir-Alexandria

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**المستخلص**

أتاحت التطورات الحديثة في تكنولوجيا المعلومات الفرصة للزائرين لإستكشاف مواقع التراث الثقافي بشكل اكثر عمقًا والاستمتاع بها، والتغلب على حواجز الوقت والمسافة واللغة من خلال التقنيات الحديثة مثل التصوير المجسم، والواقع الافتراضي واخيراً ما يعرف بالواقع المعزز. وفي صناعة السياحة، برز الواقع المعزز كأداة تسويقية فعَالة وقناة معلوماتية تنقل التجارب السياحية للمشاهدين. ولكن لا يُعرف الكثيرون عن تأثير القيمة التجريبية للواقع المعزز على الزوار والوجهات السياحية. اليوم ، يتم استخدام الواقع المعزز (AR) كأداة محتملة لتعزيز تجارب الزوار وزيادة فرصهم في زيارة الوجهة. في الدراسة الحالية ، اقترحنا نموذجًا متعدد الوساطة للنظر في تأثير القيمة التجريبية للواقع المعزز (الجاذبية المرئية، الترفيه، الهروب من الواقع، والتمتع) بشكل مباشر وغير مباشر على نية السائح لزيارة الوجهة، وذلك من خلال وسيطين؛ التجربة الغامرة ورضا الزائر. اعتمدت هذه الدراسة على المنهج الكمي لدراسة العلاقة بين المتغيرات الخارجية والداخلية. كما استعانت الدراسة بالمسح الميداني من خلال توزيع مجموعة من الاستبيانات على العينة المختارة والتي بلغت 314 مشاركًا في العديد من مناطق الجذب السياحي المختلفة في مصر (البارون إمبان ، عمود السواري، أهرامات الجيزة، قلعة قايتباي). تم تحليل البيانات باستخدام **(Smart PLS version 3.0)** لاختبار 14 فرضية للدراسة الحالية. وأظهرت النتائج أن الجاذبية البصرية، والهروب من الواقع، والمتعة لهم آثار إيجابية كبيرة على التجربة

الغامرة ورضا الزائر، مما يدعم في النهاية نية السائح لزيارة الوجهة. على النقيض ، لا يُظهر الترفيه تأثيرًا كبيرًا على التجربة ورضا الزائر ونيته فى زيارة الوجهة. توفر هذه النتائج مجموعة من الاثار الهامة لتطبيقات الواقع المعزز في مواقع التراث الثقافي في مصر.

**الكلمات الرئيسية:** الواقع المعزز، نية زيارة الوجهة، تجربة غامرة، رضا الزائر، القيمة التجريبية

**Abstract**

Recent advances in information technology (IT) have allowed visitors to more completely explore and admire cultural heritage sites, overcoming time, distance, and language barriers through emerging technologies like holography, augmented reality (AR), and virtual reality (VR). In the tourism industry, augmented reality has emerged as an effective marketing tool and an information channel that transmits tourist experiences to viewers. Although augmented reality has become more prevalent, not many know about the impact of the experiential value of augmented reality, especially on visitors and tourist destinations. Today, augmented reality (AR) is being used as a potential tool for enhancing visitors' experiences and increasing their chances of visiting a destination. In the current study, we proposed a multi-mediation model to look at the influence of the experiential value of augmented reality (visual appeal, entertainment, escapism, and enjoyment) directly and indirectly on destination intention to visit through two mediators; the immersive experience and visitor satisfaction. This study has been based on a

quantitative approach to study the relationship between exogenous and endogenous variables. This study also used a survey method by distributing a set of questionnaires to the selected sample that amounted to 314 participants in many different tourist attractions in Egypt (Baron Empain, Pompay Pillar, Pyramids of Giza, and Qaithbay Citadel). The data has been analyzed using Smart PLS version 3.0 in order to test 14 hypotheses. Results show that visual appeal, escapism, and enjoyment have significant positive effects on the immersive experience and visitor satisfaction, ultimately increasing the destination visit intention. By contrast, entertainment does not exhibit a substantial influence on an immersive experience, visitor satisfaction, and destination visit intention. These results provide important implications for augmented reality implementations at cultural heritage sites in Egypt.

**Keywords**: Augmented Reality, Destination Visit Intention, immersive experience, visitor satisfaction, Experiential Value

## Introduction

The tourism sector has witnessed many developments throughout history, in parallel with new technological developments, and has been focused on attracting tourists, getting their attention, raising curiosity, and fulfilling their needs (Feiner et al., 1997; Delagi, 2010; Bulearca & Tamarjan, 2010; Arroyo et al., 2011). Recently, the use of technology in the tourism sector has become critical for gaining the largest number of tourists and fostering competition and innovation between destinations and businesses (Mamrayeva & Aikambetova, 2014; Maia,

2017; Boletsis & Chasanidou, 2018). Indeed, the advances in information technologies have enabled destinations and businesses to provide new opportunities in management and marketing activities, besides creating a competitive advantage (Chen & Sheldon, 1997; Li et al., 2017; Ceccarini & Prandi, 2019; Buhalis & Yen, 2020).

There is no doubt that the role of technology developments was not limited to only increasing competition between destinations and businesses, but also focused on getting over the crisis (Purba et al., 2021; Akhtar et al., 2021; Petrović et al., 2021). The closest example of that is the coronavirus pandemic that appeared at the end of 2019 (Lau, 2020; Qiu et al., 2021; Perić & Vitezić, 2021). It is necessary to point out that the world has been benefiting from the advances of technology in various fields to face the crisis, such as medicine, education, and tourism (Azouri et al., 2016; Khatri, 2019; Mohanty et al., 2020). Since the onset of the crisis, the governments have imposed strict restrictions to mitigate the pressure on the health sector, most notably the street curfew and preventing international and domestic travel (Lau, 2020; Qiu et al., 2021; Petrović et al., 2021; Perić & Vitezić, 2021).

The travel and tourism industry have become the hardest-hit industry in the current pandemic (Backer et al., 2020; Nhamo et al., 2020; Lau, 2020; Ying et al., 2021). Most tourist service providers, regardless of their nature, size, or scale of operations, have been suffering from massive losses that are estimated to be around 400 billion (Lau, 2020; Nhamo et al., 2020; Ying et al., 2021). Coronavirus pandemic lockdowns have changed the way tourist service

providers think (Backer et al., 2020; Nhamo et al., 2020; Akhtar et al., 2021). Most of them have viewed this virus as an opportunity to offer a new direction for the tourism industry by working to activate the sustainability concept in the future (Nhamo et al., 2020; Ying et al., 2021; Perić & Vitezić, 2021). Hence, it seems that it is important to review our tourism practices and adopt some innovative techniques that enhance the sustainability concept while eliminating others that are inimical to the sustainability objective (Arroyo et al., 2011; Troshin, 2020; Rashideh, 2020). In this regard, ICT-driven initiatives such as augmented reality, virtual reality, mixed reality, and hologram technology can not only activate sustainability principles in the tourism industry but also improve a digital environment where smart tourism aims to develop tourist experiences, improve visitor satisfaction, and re-visit destinations in the future through a set of interactive applications (Mamrayeva & Aikambetova, 2014; Boletsis & Chasanidou, 2018; Ceccarini & Prandi, 2019; Buhalis & Yen, 2020).

## Literature Reviews

### Augmented Reality

In recent years, augmented reality (AR) has been one of the most innovative technologies (Han et al., 2013; Yung & Khoo-Lattimore, 2019). AR technology has three distinguishing characteristics (Kečkeš & Tomičić, 2017; Cranmer, et al., 2020): it integrates the real and virtual worlds where computer-generated virtual information mixes smoothly and realistically into the real world, is even more interactive than others, and is displayed as 3D images (Kounavis et al., 2012; Tahyudin et al., 2015; Cranmer, et

al., 2020). Furthermore, AR can control the displayed image by adding or removing physical elements and replacing them with alternative content (Kounavis et al., 2012; Han et al., 2013; Tahyudin et al., 2015). Some describe it as a tool that links the real world to the digital world in order to enhance users' view of their physical world (Kečkeš & Tomičić, 2017; Yung & Khoo-Lattimore, 2019; Cranmer, et al., 2020).

The emergence of augmented reality technology dates back to the late 1960s and early 1970s, with Ivan Sutherland's development of the first head-mounted display system (Yung & Khoo-Lattimore, 2019; Cranmer, et al., 2020; Loureiro, 2020; Saragih, 2020). While the scientific term "augmented reality" was coined in the 1990s by a Boeing researcher named Tim Caudell, since the beginning of the millennium, AR technology has gone through several steps to become one of the computer technologies that has gained wide and rapid spread (Kečkeš & Tomičić, 2017; Yung & Khoo-Lattimore, 2019; Saragih, 2020). Prior to 1990, AR technology was used by many large companies for simulation, training, and other purposes (Chung, 2018; Loureiro, 2020; Saragih, 2020). However, this situation has been gradually changing since the advent of wireless technology, particularly with the introduction of the iPhone in 2007 and the smartphone, which is an important device for the accessibility of AR applications (Kysela & Štorková, 2015; Yung & Khoo-Lattimore, 2019; Saragih, 2020).

However, the technique of Augmented Reality (AR) was still not known nor used by the public (Chung, 2018; Yung

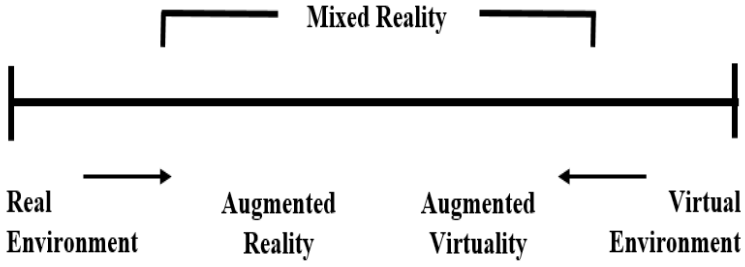
& Khoo-Lattimore, 2019; Loureiro, 2020). Thanks to the "Pokémon Go" game that launched in 2016, the public has become more aware and keen on using AR technology (Kečkeš & Tomičić, 2017; Saragih, 2020). Researchers have also become more passionate about exploring augmented reality technology and its applications (Kysela & Štorková, 2015; Chung, 2018; Loureiro, 2020). Augmented reality (AR) has been defined as *"an Application that supplements the real world with computer-generated virtual objects that appear to coexist in the same space as the real world"* (Azuma et al., 2001, p.34).

VR and AR technologies are based on creating a completely new scene that cannot be touched by hand but is sensually perceived through a combination of artificial visual and sound effects (Nayyar et al., 2018; Jung & tom Dieck, 2018). The difference between VR and AR lies in the surrounding environment (Jung & tom Dieck, 2018; Wei, 2019). Through VR, the user is in another world (virtual world), while the user through AR is in his real world, but with the addition of some effects (Wei, 2019; Han, 2019; Loureiro, 2020). AR technology needs software that supports this technique and owning a smartphone as well as smart glasses, unlike virtual reality, which needs more advanced tools (Furht, 2011; Han, 2019; Saragih, 2020).

Mixed Reality (MR) is an important development in augmented reality technology (Egger & Neuburger, 2020; Trunfio & Campana, 2020; Bec et al., 2021). It is a hybrid environment in which virtual objects are added to the physical environment, i.e., it mixes the virtual with the real

world, as clarified in Figure 1 (Milgram & Kishino, 1994; Han, 2019; Egger & Neuburger, 2020; Trunfio & Campana, 2020; Saragih, 2020).

**Figure .1 Mixed Reality**




**Source:** Milgram and Kishino (1994).

Through Mixed Reality, the user can walk in this virtual environment and change the location and size of objects and control them (Raptis et al., 2018; Trunfio & Campana, 2020; Bec et al., 2021). The crucial difference between augmented and mixed reality is the tools that are used (Gaberli, 2019; Egger & Neuburger, 2020). MR relies on headphones only, whereas AR is visible on a flat screen like a smartphone or a tablet (Han, 2019; Trunfio & Campana, 2020).

A hologram is a method of three-dimensional photography by holography in which realistic scenes are photographed and then represented as if they were in terms of dimensions and shape (Clini et al., 2017; Elmahal et al., 2020; Rauschnabel, 2021). There are major differences between augmented reality and hologram technology in principle, how they work, and their uses (Egger & Neuburger, 2020; Rauschnabel, 2021; Bec et al., 2021). As mentioned above,

AR is a depiction of a scene that is basically in the real world, but with additional virtual data that is added to this scene, while hologram applications work on transmitting the image that you cannot see except by advanced devices that show the image in its true dimensions (Clini et al., 2017; Elmahal et al., 2020; Trunfio & Campana, 2020; Rauschnabel, 2021).

**Augmented Reality in Tourism and Museums**

Tourism and travel sector professionals have noticed how important the potential technological application known as "augmented reality" is since 2000, which led to the emergence of many studies and research over the past 10 years, but it has not received the desired popularity (Azuma et al., 2001; Han et al., 2013; Jung & tom Dieck, 2018; Wei, 2019). Many researchers, such as Olsson and Salo (2011) and Zamani et al. (2012) have conducted studies on the difference between virtual and augmented reality and how to use both of them in the tourism industry.

Emerging technologies such as augmented reality (AR), virtual reality (VR), and holography have had a significant influence on and disruption to many tourism businesses and organizations (Clini et al., 2017; Nayyar et al., 2018; Jung & tom Dieck, 2018; Elmahal et al., 2020). With increasing awareness of the importance of these emerging technologies, tourists' behavior has altered, starting with the search for tourist information, comparing alternatives, reading feedback and reviews, selecting the appropriate alternative, and completing the purchase process (Chung, 2018; Yung & Khoo-Lattimore, 2019; Loureiro, 2020). Recently, as the use of these technologies has increased, it has become difficult to distinguish between real and virtual

tourist experiences, which has led to the emergence of much research examining the impact of augmented reality and other technologies on tourism experiences (Kysela & Štorková, 2015; Yung & Khoo-Lattimore, 2019; Saragih, 2020). For example, Kounavis et al. (2012) have asserted that AR apps are an effective tool for meeting many tourist needs such as attracting attention, ease of use, cultural value, and reusability again.

According to the previous literature, the initial generation of tourist apps relied on location-based augmented reality technology (Geo AR), which enables users to place digital information and virtual materials in a real-world environment (Yovcheva et al., 2012; Clini et al., 2017; Nayyar et al., 2018; Saragih, 2020). For example, most historic sites provide informational flyers and maps of notable tourist locations (Chung, 2018; Yung & Khoo-Lattimore, 2019; Tsai, 2020). Moreover, tourism bureaus often provide visitors with city maps with POI (Kounavis et al., 2012; Yung & Khoo-Lattimore, 2019; Loureiro, 2020). With the advancement of technology in tourism now, researchers have suggested using these physical flyers and maps as a base to put AR content on, where tourists can hold the tourist map and point their smartphone towards it with the AR app (Clini et al., 2017; Tussyadiah, 2018; Tsai, 2020). This technology has raised the value of physical flyers, documents, and brochures, which offer visitors extra information and rich visual content (Shabani & Hassan, 2018; Yung & Khoo-Lattimore, 2019; Loureiro, 2020; Tsai, 2020).

A significant number of augmented reality (AR) apps have been produced and given by cultural heritage institutions or organizations in order to disseminate historical knowledge by integrating actual resources with virtual pictures and information (Linaza et al., 2012; Clini et al., 2017; Shabani & Hassan, 2018; Jung & tom Dieck, 2018; Elmahal et al., 2020). Therefore, AR not only prevents physical deterioration of cultural and archaeological sites that is aggravated by mass tourism, which has exceeded the acceptable limits for physical carrying capacity, but also provides a lot of information to gain historical knowledge while adding joy (Zamani et al., 2012; Leue & Jung, 2014; Shabani & Hassan, 2018; Jung & tom Dieck, 2018).

Lately, several cultural and heritage publications have begun to show the possibility of applying AR in order to improve the tourist experience (White et al., 2003; Lee & Park, 2007; Jung & tom Dieck, 2018; Shabani & Hassan, 2018). For example, Moorhouse et al. (2019) examined the usage of augmented reality (AR) for the educational experience in museums, and they discovered that AR aids in creating immersive educational experiences. Likewise, Southall et al. (2019) emphasized AR's power in creating memorable tourism experiences. If AR is not employed appropriately, it will be nothing more than a gimmick and may even be more damaging to the experience than useful (Jung et al., 2016; Nayyar et al., 2018; Saragih, 2020). This does not mean that there are several successful applications of augmented reality in museums (Choi, 2014; Jung et al., 2016).

At the international level, the National Museum of Natural History in France has launched a project called "REVIVRE" that uses augmented reality technology to allow visitors to see how extinct animals looked in the real world (Damala & Stojanovic, 2012; Fenu & Pittarello, 2018; Özkul & Kumlu, 2019; Kaghat et al., 2020). In Singapore, the National Museum has launched a project called "Story of the Forest" that includes 69 pictures of natural history paintings (Desai, 2018; He et al., 2018; Özkul & Kumlu, 2019). These pictures have been transformed into three-dimensional animations relying on augmented reality technology, which allows visitors to interact with them through downloading an app on their smartphone or tablet (Desai, 2018; He et al., 2018; Özkul & Kumlu, 2019).

At the local level, in 2017, the Grand Egyptian Museum in Cairo allowed researcher Ramy Hammady to implement a program based on mixed reality, which he designed as part of his research to obtain a doctorate from Staffordshire University in Britain (Nofal, 2013; Hammady et al., 2018; Hammady et al., 2020). The project relied on spatial holographic head-mounted displays (HMD) called "MuseumEye" that displayed the holdings of the Pharaonic King Tutankhamun in a 3D form on a virtual tour accompanied by the king to explain and present his holdings in an innovative technique instead of a tour guide, as shown in Figure 2 (Hammady et al., 2018; Hammady et al., 2020; Hammady & Ma, 2021).

**Figure .2 Shots from the HMD at the Egyptian Museum in Cairo**


**Source: Hammady et al. (2020).**

The Center for Documentation of Cultural and Natural Heritage (CULTNAT) of the Bibliotheca Alexandrina has developed a set of apps based on augmented reality technology in order to enrich heritage content in an easy and attractive way as shown in Figure 3 (Nofal, 2013; Sadek, 2020). This technique has been used on the Yuya Papyrus, which is displayed in the Egyptian Museum, The Book of the Dead, and The Papyrus of Ani (Nofal, 2013; Sadek, 2020).

**Figure 3. Yuya Papyrus AR App**


## Experiential Value

Unquestionably, visitors are a destination's most valuable asset, so a destination should focus on attracting new visitors, developing relationships with current visitors, and keeping them (Yuan & Wu, 2008; Laing et al., 2014; Han et al., 2021). In particular, marketing professionals should understand what variables create visitor value (Laing et al., 2014; Varshneya et al., 2017; Fu & Wang, 2020; Han et al., 2021). Creating unique and new visitor value is essential for any destination to stay on top of the competition (Yuan & Wu, 2008; Barnes et al., 2020; Han et al., 2021). Monroe (1991) mentioned that customer value is "*the comparison between recognized benefits and sacrifices*", while Strauss and Frost (2002) defined customer value as "*a combination of customers' belief, attitude, and experience of a product*". Apart from different definitions of customer value, the key definition of customer value is formed by a balance

between advantages and sacrifices (Laing et al., 2014; Varshneya et al., 2017; Han et al., 2021).

This value provides customers with both internal and external advantages (Yuan & Wu, 2008; Chen & Hsieh, 2010; Laing et al., 2014; Fu & Wang, 2020). The internal advantage is that of beginning and finishing a process, while the external advantage is the joy and contentment that come with completing a process (Jamal et al., 2011; Varshneya et al., 2017; Han et al., 2021). According to some researchers, the external advantage of customer value is the customer's attitudes and reactions after receiving the service or product (Laing et al., 2014; Fu & Wang, 2020; Kim et al., 2021). It is necessary to point out that customers can gain experiential value from a wide range of experiences (Varshneya et al., 2017; Fu & Wang, 2020; Han et al., 2021). When compared to customer value, experiential value is concerned with the value that customers retain as a result of these experiences (Jamal et al., 2011; Varshneya et al., 2017; Yuliviona et al., 2019; Fu & Wang, 2020). Despite the congruence between customer value and experiential value, the literature on experiential value is scarce and inadequate (Fu & Wang, 2020; Han et al., 2021). Mathwick et al. (2001) have defined that experiential value is "*customer's perception of a product or service through direct use or indirect observation*"

From reviewing previous literatures, most researchers have emphasized that aesthetic and playfulness features are the major elements of customer value (Varshneya et al., 2017; Yuliviona et al., 2019; Fu & Wang, 2020; Han et al., 2021). Consequently, this research relied on these two features to

measure the experiential value as exogenous variables. First, aesthetics consists of two dimensions (visual appeal and entertainment): visual appeal, which can be recognized through the main senses like sight, hearing, taste, and touch; all of them promote customer satisfaction and generate visit intention (Varshneya et al., 2017; Yuliviona et al., 2019; Fu & Wang, 2020; Han et al., 2021). Entertainment that shows customers' interest in the dramatic or astonishing characteristics of service performance (Fu & Wang, 2020; Han et al., 2021). Second, playfulness includes two dimensions (enjoyment and escapism): enjoyment means an experience's emotional worth and prospective enjoyment (Fu & Wang, 2020; Han et al., 2021). While escapism means an escape from the stresses of everyday life (Han et al., 2021). Thus, to enhance the understanding of the influence of the experiential value of augmented reality on destination visit intention, the current study suggests the following hypotheses:

**Hypothesis 1c (H1c):** *Visual Appeal has a positive influence on destination visit intention.*

**Hypothesis 2c (H2c):** *Entertainment has a positive influence on destination visit intention.*

**Hypothesis 3c (H3c):** *Enjoyment has a positive influence on destination visit intention.*

**Hypothesis 4c (H4c):** *Escapism has a positive influence on destination visit intention.*

**Augmented Reality and Immersive Experience**

Indeed, the traditional elements used in product and service marketing, such as price, quality, and efficiency are no longer sufficient to promote and sell these products or

services (Fritz et al., 2005; Weber, 2014; Fiore et al., 2014; Avci, 2019; Bec et al., 2019). Nowadays, customers prefer to look for meaning and additional value in the form of experience related to the product or service (Linaza et al., 2013; Jung et al., 2016; Ramos et al., 2016; Tomičić, 2017). Recently, the concept of "tourism experience" and its determinants have rightly attracted the attention of most researchers in the tourism sector (Ramos et al., 2016; Tomičić, 2017; Avci, 2019; Loureiro, 2020; Fan et al., 2022). As a result, many publications and literature have emerged that refer to the most significant factors that influence the tourism experience (Han, et al., 2019; Cranmer, 2019; Lv et al., 2020; Lee et al., 2020; Loureiro, 2020).

From reviewing the literature, there are quite a number of studies that have focused on the impact of information and communications technology on the tourism experience (Fritz et al., 2005; Ganapathy, 2013). It should be taken into consideration that visitor is not only satisfied with obtaining a tourism experience, but also looking for an immersive and memorable tourism experience (Tomičić, 2017; Han, et al., 2019; Cranmer, 2019; Lee et al., 2020; Loureiro, 2020; Jiang et al., 2022; Fan et al., 2022). Pine and Gilmore (1998) were the first to underline the relevance of "staged experiences" that include immersion, absorption, and engagement as part of enhanced tourism experiences (Ganapathy, 2013; Linaza et al., 2013). Also, they claimed that there are four types of tourism experiences: aesthetic, entertainment, education, and escapism, and they suggested merging these types may make the tourism experience more immersive (Avci, 2019; Loureiro, 2020; Jiang et al., 2022; Fan et al., 2022).

The current study has focused on all the literatures that have interested in enhancing the tourism experience through technology, especially augmented and virtual reality technology (Fritz et al., 2005; Ganapathy, 2013; Linaza et al., 2013; Weber, 2014; Fiore et al., 2014; Jung et al., 2016; Ramos et al., 2016; Tomičić, 2017; Han, et al., 2019; Cranmer, 2019; Avci, 2019; Bec et al., 2019; Marzouk et al., 2019; Gaberli, 2019; Lv et al., 2020; Lee et al., 2020; Loureiro, 2020; Jiang et al., 2022; Fan et al., 2022). Based on the above, the significant influence of augmented reality on the tourism experience has been well confirmed within these previously researches. Accordingly, the following hypotheses have been suggested:

**Hypothesis 1a (H1a):** *Visual Appeal has a positive influence on immersive experience.*

**Hypothesis 2a (H2a):** *Entertainment has a positive influence on immersive experience.*

**Hypothesis 3a (H3a):** *Enjoyment has a positive influence on immersive experience*.

**Hypothesis 4a (H4a):** *Escapism has a positive influence on immersive experience.*

**Hypothesis 5a (H5a):** *Immersive experience has a positive influence on destination visit intention.*

**Hypothesis 5b (H5b):** *The relationship between visual appeal and destination visit intention is mediated by immersive experience.*

**Hypothesis 5c (H5c):** *The relationship between entertainment and destination visit intention is mediated by immersive experience.*

**Hypothesis 5d (H5d):** *The relationship between enjoyment and destination visit intention is mediated by immersive experience.*

**Hypothesis 5e (H5e):** *The relationship between escapism and destination visit intention is mediated by immersive experience.*

**Augmented Reality and Visitor Satisfaction**

Studying and determining the degree of satisfaction with tourist services provided is one of the most important principles upon which successful tourism marketing is based (So & Kim, 2013; Jung et al., 2016; Dieck & Jung, 2017). Visitor satisfaction is an important approach that many destinations take as a slogan to attract visitors and ensure their loyalty (Genç, 2018; Trunfio et al., 2018; Serravalle et al., 2019; Shin & Jeong, 2021). Therefore, Tourism destinations are currently seeking to provide technology-based value added services that improve the tourism experience and satisfy their visitors through depending on augmented, virtual, and mixed reality (Trunfio et al., 2018; Wakefield et al., 2019; Tsai, 2020; Trunfio et al., 2022).

Numerous academics found that the use of augmented reality technology is beneficial for a variety of reasons (So & Kim, 2013; Jung et al., 2016; Trunfio et al., 2018; Serravalle et al., 2019; Trunfio et al., 2022). For example, Martnez-Graa et al. (2013) have mentioned that AR apps are beneficial to the tourism sector through raising travellers' social awareness of their immediate surroundings, especially in unfamiliar areas. Moreover, AR applications assist travellers in gaining a good understanding of the roots of history in a simple and

straightforward manner (Wakefield et al., 2019; Tsai, 2020; Shin & Jeong, 2021; Trunfio et al., 2022). Additionally, AR technology has been recognised as a popular tool for educating museum visitors (So & Kim, 2013; Jung et al., 2016; Tahyudin & Saputra, 2017; Genç, 2018).

In the context of tourism publications, most studies indicate a positive relationship between augmented reality and visitor satisfaction at heritage sites and museums (So & Kim, 2013; Jung et al., 2016; Dieck & Jung, 2017; Tahyudin & Saputra, 2017; Genç, 2018; Trunfio et al., 2018; Serravalle et al., 2019; Wakefield et al., 2019; Tsai, 2020; Shin & Jeong, 2021; Trunfio et al., 2022). As a result, the following hypotheses have been proposed:

**Hypothesis 1b (H1b):** *Visual appeal has a positive influence on visitor satisfaction.*

**Hypothesis 2b (H2b):** *Entertainment has a positive influence on visitor satisfaction.*

**Hypothesis 3b (H3b):** *Enjoyment has a positive influence on visitor satisfaction.*

**Hypothesis 4b (H4b):** *Escapism has a positive influence on visitor satisfaction.*

**Hypothesis 6a (H6a):** *Visitor satisfaction has a positive influence on destination visit intention.*

**Hypothesis 6b (H6b):** *The relationship between visual appeal and destination visit intention is mediated by visitor satisfaction.*

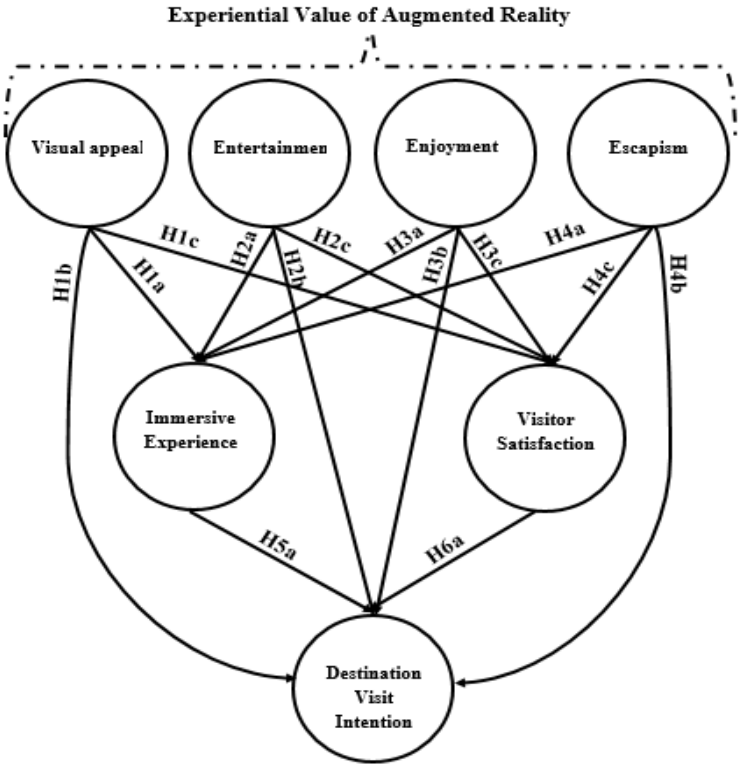
**Hypothesis 6c (H6c):** *The relationship between entertainment and destination visit intention is mediated by visitor satisfaction.*

**Hypothesis 6d (H6d):** *The relationship between enjoyment and destination visit intention is mediated by visitor satisfaction.*

**Hypothesis 6e (H6e):** *The relationship between escapism and destination visit intention is mediated by visitor satisfaction.*

Generally, to examine the influence of experiential value of augmented reality technology on destination visit intention, we suggest the conceptual model shown in Figure 4.

**Figure .4 The Conceptual Model**



## Method

### Sampling and Data Collection

To test study hypotheses, the study relied on a quantitative approach to examine the relationship between exogenous and endogenous variables. This study also used a survey method by distributing a set of questionnaires to the selected sample in hard copy form only. Since the subject of the study depends on direct contact with tourists to view some archaeological sites via augmented reality glasses (3D VR headset) and apps and sites that support augmented reality in Egypt before starting the questionnaire, First, the virtual official website that was launched by the Egyptian Ministry of Tourism and Antiquities on April 5, 2020, that allows people from all around the world to watch ancient Egyptian civilization in the middle of the coronavirus pandemic. Second, "Around Egypt" is a smartphone app that provides an augmented reality experience for many tourist attractions in Egypt. The average watch time was approximately 6 minutes. A survey was conducted during a mid-year vacation period from March 10th to March 18th, 2022. The current study relied on purposive sampling since the study focused on international visitors only at selected tourist attractions (Baron Empain, Pompay Pillar, Pyramids of Giza, and Qaithbay Citadel). The target sample amounted of 450 respondents (Table. 1). However, only 314 of the questionnaires were valid for data analysis, and 136 of these were discarded because the questionnaires had been wrongly completed. When analyzing the data, the study was based on Smart PLS version 3.0 in order to test 14 hypotheses as a direct effect and 8 hypotheses as mediators.

**Table.1 Demographic profile (314)**

| Items | N | Percentage | Items | N | Percentage |
|---|---|---|---|---|---|
| **Q1) Age** | | | **Q4) Marital status** | | |
| 18-25 | 75 | 24% | Single | 121 | 38% |
| 26-35 | 88 | 28% | Married | 85 | 27% |
| 36-45 | 101 | 32% | Married with children | 99 | 32% |
| Over 46 | 50 | 16% | Other | 9 | 3% |
| **Q2) Gender** | | | **Q5) Education** | | |
| Male | 170 | 54% | High school | 98 | 31% |
| Female | 144 | 46% | University student / Graduate | 204 | 65% |
| | | | Postgraduate | 12 | 4% |
| **Q3) Nationality** | | | **Q6) Monthly income** | | |
| Middle East | 23 | 8% | Less than $1000 | 23 | 7% |
| Africa | 85 | 27% | $1000–$1999 | 78 | 25% |
| Asia and the pacific | 17 | 5% | $2000–$2999 | 82 | 26% |
| Americas | 78 | 25% | $3000–$3999 | 101 | 32% |
| Europe | 111 | 35% | More than $4000 | 30 | 10% |
| **Total** | **314** | **100%** | **Total** | **314** | **100%** |

Table 1 outlines the characteristics of the participants. The percentage of participants who were aged between 18 and 25 years old was about 24%. followed by those aged 26 to 35 with 28%. The majority of the participants were older and younger adults who were aged 36 to 45 years old (32%), followed by senior visitors over 46 years old (16%). 54% of the study population were males, and 46% were females. More than one-third of the study population were from Europe (35%), Africans (27%), Americans (25%), and

8% from the Middle East, and finally, 5% from East Asia and the Pacific countries. Since the emergence of the COVID-19, most countries have implemented some restrictions on travel. With regard to marital status, most participants (38%) were single, followed by those who were married and had children (32%), and those who were married and had no children (27%). More than two thirds of the study population have bachelor's degrees or lower (65%), followed by 31% who have graduated from high school. Finally, a few cases had postgraduate studies (3%). The majority of participants' monthly income level (32%) was ranged between $3000 and $3999, followed by those who had a monthly income of about $2000 to $2999 (26%), and those who had a monthly income ranged from $1000 to $1999, followed by those who had a monthly income of more than $4000 with 10%. Finally, 7% of the study population has a monthly income of less than $1000.

**Scale Development**

The data was collected using a multi-item questionnaire. Items were extracted from the prior studies to ensure the content validity of the data. The questionnaire was split into seven sections. The first four sections are designed to assess the experiential value of augmented reality technology on the study population. The first section comprised four items to evaluate the visual appeal of augmented reality at a heritage sites, which were adapted from an earlier published researches (Jung et al., 2016; Han et al., 2021). The second section, the entertainment aspect of augmented reality was evaluated by integrating four modified items that were quoted from prior studies (Jung et al., 2016; Han et al., 2021). The third section, "Enjoyment" was examined by using three modified items that were acquired from

previous researches (Jung et al., 2016; Han et al., 2021). The fourth section, to assess "escapism", the study relied on a four-item modified scale, which was also borrowed from the existing literature (Jung et al., 2016; Han et al., 2021). The fifth section, Satisfaction with augmented reality experiences at heritage sites was also examined by incorporating seven modified items, which were adapted from many prior studies (So & Kim, 2013; Jung et al., 2016; Tahyudin & Saputra, 2017; Genç, 2018; Tsai, 2020; Shin & Jeong, 2021; Trunfio et al., 2022). The sixth section, a seven-item modified scale was used to evaluate the immersive experience that visitors get after using augmented reality apps. These items were taken from previous studies (So & Kim, 2013; Jung et al., 2016; Han et al., 2018; Avci, 2019; Serravalle et al.,2019; Loureiro, 2020; Trunfio et al., 2022; Jiang et al., 2022). The seventh and last section presents the dependent variable of the current study (Destination Visit Intention), which comprises 4 items, which were adapted from previously published studies (Chung et al., 2015; Chung et al., 2018; Wei, 2019; Lacka, 2020; Shin & Jeong, 2021). As clarified in Table 2.

## Results and Discussion

### Data Analysis

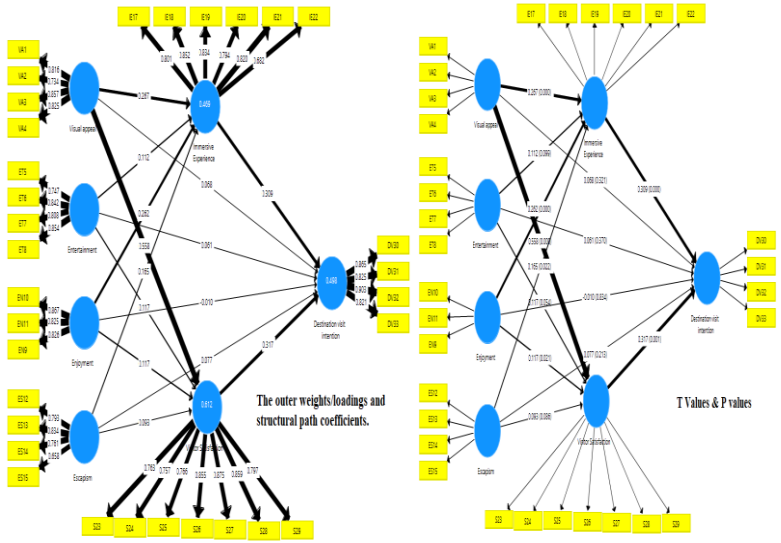
In the context of tourism literature, the popularity of partial least squares structural equation modelling has increased significantly since 2013 (Hussein et al., 2015; Nitzl et al., 2017). Before that, Henseler et al. (2009) pointed out that the PLS is a powerful and more resilient statistical approach for structural model estimation, especially in the most complex situations. Furthermore, (1) it can analyze formative indicators, (2) it is unconcerned about the number

of items, (3) it can analyze small-size data, (4) it can process data with a non-normal distribution, (5) it can test the complex mediation model, and (6) it has the predictive power of the model. Therefore, current research has relied on structural modelling to analyze data and test hypotheses (Chin, 1998; Henseler et al., 2009; Nitzl et al., 2017). The Smart-PLS (V 3.3) software was used to test the casual relationship between the experiential value of augmented reality, immersive experiences towards heritage sites, satisfaction towards heritage sites, and destination visit intention.

**Measurement Model Assessment**

First of all, to ensure the Internal consistency and convergent of the proposed model, the composite reliability of all latent constructs must exceed threshold of 0.70. (Fornell & Larcker, 1981; Bagozzi & Yi, 1988; Barclay et al., 1995; Hair et al., 2014). Table 3 demonstrates that factor loading values for each item in the current proposed model were accepted because they exceeded the threshold of 0.60, except for "IE16" as shown in Figure 5, which was deleted (Fornell & Larcker, 1981; Bagozzi & Yi, 1988; Barclay et al., 1995). Moreover, the average variance extracted for each construct varied from 0.584 to 0.730, all constructs have exceeded the proposed threshold of 0.50. (Fornell and Larcker, 1981; Hair et al., 2017).

## Figure .5 PLS-SEM Output for Proposed Model




## Table .2 Measurement model assessment results

| Constructs/measured items | | Convergent validity | | Construct reliability | | | Source |
|---|---|---|---|---|---|---|---|
| | | Factors loading | Results | AVE[a] | α[a] | CR[a] | |
| **Visual appeal** | | | | 0.655 | 0.823 | 0.655 | |
| VA1 | The AR application demonstrates the fine details of ancient Egyptian artifacts. | **0.816** | Accept | | | | (Jung et al., 2016; Han et al., 2021) |
| VA2 | The augmented reality scenes are in keeping with the atmosphere of the destination. | **0.734** | Accept | | | | |
| VA3 | The AR application | **0.857** | Accept | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | has contributed to telling historical novels and legends in simple visual scenes. | | | | | | |
| VA4 | The destination has become more attractive through the AR application. | **0.825** | Accept | | | | |
| **Entertainment** | | | | **0.662** | **0.830** | **0.662** | (Jung et al., 2016; Han et al., 2021) |
| ET5 | Augmented reality (AR) was an entertaining experience. | **0.747** | Accept | | | | |
| ET6 | Augmented reality (AR) was an exciting experience. | **0.842** | Accept | | | | |
| ET7 | Augmented reality (AR) was captivating. It has captured my attention. | **0.808** | Accept | | | | |
| ET8 | Using augmented reality was an amusing experience. | **0.854** | Accept | | | | |
| **Enjoyment** | | | | **0.705** | **0.791** | **0.877** | (Jung et al., 2016; Han et al., 2021) |
| EN9 | I have thoroughly enjoyed this cultural experience with augmented reality. | **0.826** | Accept | | | | |
| EN10 | Using augmented reality at a destination was an interesting experience. | **0.867** | Accept | | | | |
| EN11 | My experience has been amazing at the destination. | **0.825** | Accept | | | | |
| **Escapism** | | | | **0.584** | **0.764** | **0.584** | ( J u |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ES12 | When I used the augmented reality application, I felt like I was playing a different character. | **0.793** | Accept | | | | |
| ES13 | When I used the augmented reality application, I felt like I was in another time or place. | **0.834** | Accept | | | | |
| ES14 | The augmented reality experience has allowed me to imagine myself as someone else. | **0.761** | Accept | | | | |
| ES15 | When I used the augmented reality application, I felt like I had completely escaped from reality. | **0.658** | Accept | | | | |
| **Immersive Experience** | | | | **0.639** | **0.886** | **0.639** | (So & Kim, 2013; Jung et al., 2016; Han et al., 2018; Avci, 2019; Serravalle et al.,2019; Loureiro, 2020; Trunfio et al., 2022; Jiang et al., 2022). |
| IE16 | This experience has helped me to learn more about the ancient Egyptian civilization. | 0.572 | Delete | | | | |
| IE17 | The augmented reality experience is similar to that of the real world. | **0.801** | Accept | | | | |
| IE18 | I don't find augmented reality to be an unnatural experience. | **0.852** | Accept | | | | |
| IE19 | The augmented reality experience has given me wonderful memories. | **0.834** | Accept | | | | |
| IE20 | I'll never forget my | **0.794** | Accept | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | experience with the augmented reality application. | | | | | | |
| IE21 | Using augmented reality at the destination was a real learning experience. | **0.820** | Accept | | | | |
| IE22 | Using augmented reality contributed positively to enhancing my cultural experience. | **0.682** | Accept | | | | |
| **Visitor Satisfaction** | | | | **0.659** | **0.913** | **0.659** | (So & Kim, 2013; Jung et al., 2016; Tahyudin & Saputra, 2017; Genç, 2018; Tsai, 2020; Shin & Jeong, 2021; Trunfio et al., 2022). |
| S23 | Overall, I was satisfied with the augmented reality experience at the destination. | **0.763** | Accept | | | | |
| S24 | I enjoyed my visit to the destination. | **0.757** | Accept | | | | |
| S25 | I am satisfied with the accuracy of the information that has been presented by augmented reality. | **0.766** | Accept | | | | |
| S26 | I am satisfied with the visual interface design of the augmented reality destination. | **0.855** | Accept | | | | |
| S27 | I prefer to use augmented reality during destination visits. | **0.875** | Accept | | | | |
| S28 | Overall, I am satisfied with my tour of the destination. | **0.859** | Accept | | | | |
| S29 | I will recommend this destination to | **0.797** | Accept | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | other tourists. | | | | | | |
| **Destination visit intention** | | | | **0.730** | **0.876** | **0.915** | (Chung et al., 2015; Chung et al., 2018; Wei, 2019; Lacka, 2020; Shin & Jeong, 2021). |
| DV30 | After using the augmented reality application, I believe I will revisit the destination again. | **0.865** | Accept | | | | |
| DV31 | After using the augmented reality application, I intend to frequently visit the destination. | **0.825** | Accept | | | | |
| DV32 | I will recommend this destination to others after experiencing the augmented reality application. | **0.903** | Accept | | | | |
| DV33 | I intend to visit other Egyptian destinations that have applied the augmented reality application. | **0.821** | Accept | | | | |

**Notes: (a) Average variance extracted (AVE), Cronbach's (α), and composite reliability (CR).**

Fornell and Larcker (1981) criterion is one of the criteria by which discriminant validity is evaluated (Henseler et al., 2009; Hair et al., 2017). When the square root of the average variance extracted for each variable is higher than the inter-variables correlation, the proposed model will be satisfying (Henseler et al., 2009; Hair et al., 2011; Henseler et al., 2015). Table 3 shows that this criterion accepted. The Heterotrait–Monotrait ratio (HTMT) is the second criterion by which we can also evaluate the discriminant validity of the model. According to Henseler et al. (2015), if the Heterotrait–Monotrait ratio was less than 0.90, it means that there is discriminant validity created between two reflective variables. Table 4 demonstrates that the discriminant validity of the current model is satisfied.

**Table .3 Discriminant Validity Fornell–Larcker Criterion**

| Constructs | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| **Destination visit intention (1)** | **0.854** | | | | | | |
| **Enjoyment (2)** | 0.485 | **0.839** | | | | | |
| **Entertainment (3)** | 0.504 | 0.610 | **0.814** | | | | |
| **Escapism (4)** | 0.515 | 0.661 | 0.674 | **0.764** | | | |
| **Immersive Experience (5)** | 0.620 | 0.596 | 0.545 | 0.574 | **0.799** | | |
| **Visitor Satisfaction (6)** | 0.638 | 0.578 | 0.591 | 0.584 | 0.628 | **0.812** | |
| **Visual appeal (7)** | 0.567 | 0.588 | 0.609 | 0.601 | 0.588 | 0.754 | **0.810** |

**Note:** Bold values are the square root of AVE, and off-diagonal reflects the correlation between variables.

**Table .4 Heterotrait–Monotrait Ratio (HTMT)**

| Constructs | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| **Destination visit intention (1)** | | | | | | | |
| **Enjoyment (2)** | 0.575 | | | | | | |
| **Entertainment (3)** | 0.582 | 0.751 | | | | | |
| **Escapism (4)** | 0.598 | 0.841 | 0.853 | | | | |
| **Immersive Experience (5)** | 0.695 | 0.707 | 0.622 | 0.668 | | | |
| **Visitor Satisfaction (6)** | 0.706 | 0.665 | 0.665 | 0.671 | 0.689 | | |
| **Visual appeal (7)** | 0.660 | 0.718 | 0.736 | 0.725 | 0.679 | 0.865 | |

## Structured Model Assessment

Definitely, when we evaluate the structural model of the study according to PLS-SEM, we should look at the strength of path coefficients, prediction power ($R^2$), and the effect size ($f^2$) (Hair et al., 2019). As shown in Table 5 and 6, and Figure 6. According to Streukens and Leroi-Werelds (2016), the proposed relationships between variables of the structured model are evaluated by using bootstrapping (5000 resamples) to create confidence intervals and t-values.

**Table 5. Outcome of Structural Model Examination.**

| H | Paths | β Values | T Values | P Values | Decision |
|---|---|---|---|---|---|
| **H1a** | **Visual appeal -> Immersive Experience*** ** | 0.267 | 4.482 | **0.000** | Supported |
| **H1b** | **Visual appeal -> Destination visit intention** NS | 0.068 | 0.993 | **0.321** | unsupported |
| **H1c** | **Visual appeal -> Satisfaction*** ** | 0.558 | 11.828 | **0.000** | Supported |
| **H2a** | **Entertainment -> Immersive Experience** NS | 0.112 | 1.654 | **0.098** | Unsupported |
| **H2b** | **Entertainment -> Destination visit intention** NS | 0.061 | 0.899 | **0.369** | Unsupported |
| **H2c** | **Entertainment -> Satisfaction** NS | 0.117 | 1.927 | **0.054** | Unsupported |
| **H3a** | **Enjoyment -> Immersive Experience *** ** | 0.262 | 4.411 | **0.000** | Supported |
| **H3b** | **Enjoyment -> Destination visit intention** NS | -0.010 | 0.204 | **0.838** | Unsupported |
| **H3c** | **Enjoyment -> Satisfaction *** | 0.117 | 2.260 | **0.024** | Supported |
| **H4a** | **Escapism -> Immersive Experience*** | 0.165 | 2.279 | **0.023** | Supported |
| **H4b** | **Escapism -> Destination visit intention** NS | 0.077 | 1.219 | **0.223** | Unsupported |
| **H4c** | **Escapism -> Satisfaction** NS | 0.093 | 1.723 | **0.085** | Unsupported |
| **H5a** | **Immersive** | 0.309 | 3.829 | **0.000** | Supported |

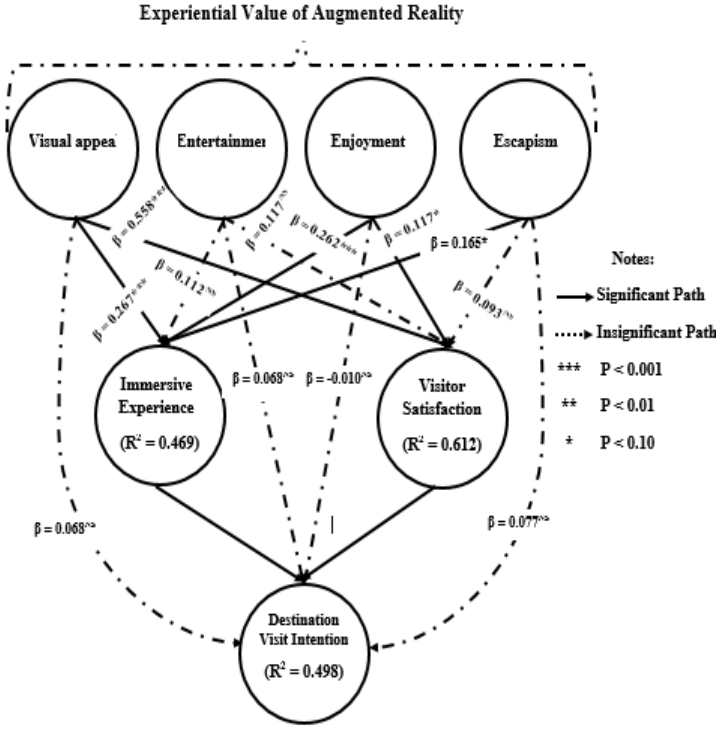
| | | | | | |
|---|---|---|---|---|---|
| | **Experience -> Destination visit intention*** ** | | | | |
| **H6a** | **Satisfaction -> Destination visit intention**** | 0.317 | 3.404 | **0.001** | Supported |

**Notes:** ***p < 0.001, **p < 0.01, (*) p < 0.05, NS not significant.

Specifically, Visual appeal of augmented reality was important and has positive impacts on immersive experience first (β= 0.267, t = 4.482, p <.001), and on visitor's satisfaction second (β= 0.558, t = 11.828, p <.001). Therefore, H1a and H1c were supported. On the other hand, H1b was rejected due to it had a negative impact on destination visit intention (β=0.068, t = 0.993, p >.05). Similarly, enjoyment as a part the experiential value of augmented reality has significant positive influences on two mediators of the study: immersive experience (β=0.262, t = 4.411, p <.001), and visitor's satisfaction (β=0.117, t = 2.260, p < .05). As a result, H3a and H3c were supported, but H3b was unsupported due to there no positive effect on destination visit intention (β=-0.010, t = 0.204, p >.05). In contrast, entertainment has no positive impacts on two mediators: immersive experience (β=0.112, t = 1.654, p >.05), visitor's satisfaction (β=0.117, t = 1.927, p >.05), and on the dependent variable (destination visit intention) (β=0.061, t = 0.899, p >.05). So, H2a, H2b, and H2c were rejected. Lastly, escapism also has a significant positive influence on immersive experience (β= 0.165, t = 2.279, p < .05), and thus, H4a was accepted. Whereas, H4b and H4c have refused because there are no significant positive influences on visitor's satisfaction (β=0.093, t = 1.723, p

>.05), and on the dependent variable (destination visit intention) (β=0.077, t = 1.219, p >.05).

**Figure 6. Structural model's path coefficient**




As clarified in the previous figure, the path coefficients revealed that mediators of the current study have a significant positive influence on the dependent variable (destination visit intention), the immersive experience (β= 0.309, t = 3.829, p <.001), and the visitor's satisfaction (β= 0.317, t = 3.404, p <.01). Hence, H5a and H6a were accepted. According to prediction power ($R^2$), the proposed structural model explains 61% of the variance in visitor

satisfaction, 47% of the variance in immersive experience, and 50% of the variance in destination visit intention. That is considered acceptable in tourism literature, especially for satisfaction and revisit intention (Barclay et al., 1995; Hair et al., 2014). Regarding the effect size ($f^2$), it was estimated by the PLS Algorithm that values of 0.02, 0.15, and 0.35, consecutively, represent small, medium, and large impacts of independent factors on dependent factors (Cohen, 1988, Hair et al., 2014). As clarified in Table 6, The results showed that the effect size ($f^2$) was large in some variables. For instance, visual appeal towards visitor's satisfaction ($f^2$= 0.42, over 0.35) and immersive experience ($f^2$= 71, over 0.35), enjoyment towards immersive experience ($f^2$=0.62, over 0.35), visitor's satisfaction towards destination visit intention ($f^2$= 0.73, over 0.35), and immersive experience towards destination visit intention ($f^2$= 0.95, over 0.35). While, there was a moderate effect between entertainment and satisfaction ($f^2$= 0.16, over 0.15), enjoyment and satisfaction ($f^2$= 0.17, over 0.15), and escapism and immersive experience ($f^2$ = 0.22, over 0.15). On the contrary, if the effect size (f2) was less than 0.02, it would not be accepted, which means that exogenous variables have a small effect on endogenous variables. For instance, escapism towards visitor's satisfaction ($f^2$= 0.09, over 0.02), entertainment towards immersive experience ($f^2$= 0.11, over 0.02), visual appeal towards ($f^2$= 0.03, over 0.02), escapism towards destination visit intention ($f^2$=0.05, over 0.02), and entertainment towards destination visit intention ($f^2$=0.03, over 0.02). While enjoyment towards destination visit intention ($f^2$= 0.000, less than 0.02), which means that an exogenous variable has no effect on an endogenous variable.

**Table .6 The Effect Size and Predictive Relevance**

| Endogenous Variables | $Q^2$ | $R^2$ | Exogenous Variables | Effect size $F^2$ |
|---|---|---|---|---|
| **Destination visit intention** | **0.355** | **0.498** | Enjoyment | **0.00** |
| | | | Entertainment | **0.03** |
| | | | Escapism | **0.05** |
| | | | Immersive Experience | **0.95** |
| | | | Satisfaction | **0.73** |
| | | | Visual appeal | **0.03** |
| **Immersive Experience** | **0.286** | **0.469** | Enjoyment | **0.62** |
| | | | Entertainment | **0.11** |
| | | | Escapism | **0.22** |
| | | | Visual appeal | **0.71** |
| **Visitor's satisfaction** | **0.395** | **0.612** | Enjoyment | **0.17** |
| | | | Entertainment | **0.16** |
| | | | Escapism | **0.09** |
| | | | Visual appeal | **0.42** |

**Multiple Mediating Effect Tests**

To examine current study mediators "immersive experience" and "visitor satisfaction" (H5b, H6b, H5c, H6C, H5d, H6d, H5e, H6e), we used a rather common new analytical approach that has been recommended in recent literature (Carrion et al., 2017; Avkiran, 2018). To assess the mediation using PLS, we bootstrap our proposed structural model, examine the direct and indirect effects, and estimate the confidence intervals for each mediator.

## Table 7. Mediation Analysis

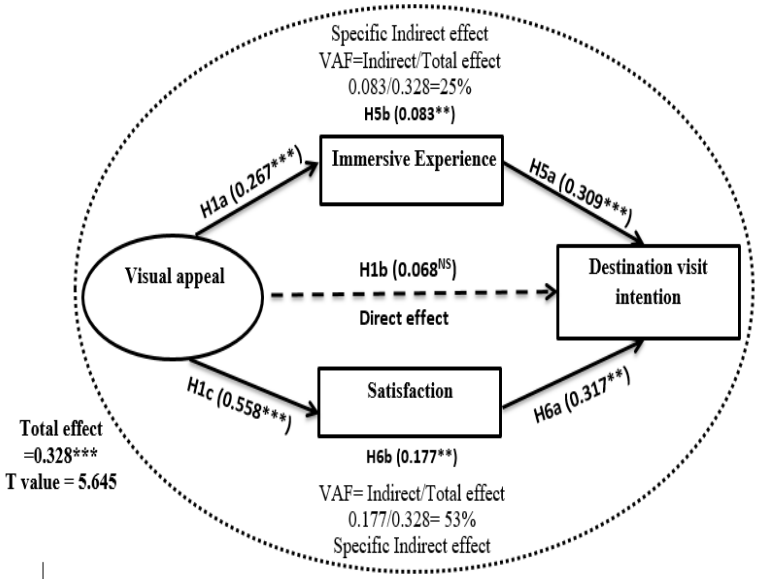
| H | Paths | Specific Indirect effect | direct effect | Total effect | Results |
|---|---|---|---|---|---|
| H5b | **Visual appeal -> Immersive Experience -> Destination visit intention** | 0.083** | 0.068$^{Ns}$ | 0.328*** (5.645) | Full Mediation |
| H6b | **Visual appeal -> Satisfaction -> Destination visit intention** | 0.177** | | | Full Mediation |
| H5c | **Entertainment -> Immersive Experience -> Destination visit intention** | 0.035$^{NS}$ | 0.061$^{NS}$ | 0.133$^{NS}$ (1.769) | No effect Mediation |
| H6c | **Entertainment -> Satisfaction -> Destination visit intention** | 0.037$^{NS}$ | | | No effect Mediation |
| H5d | **Enjoyment -> Immersive Experience -> Destination visit intention** | 0.081** | -0.010$^{NS}$ | 0.108$^{NS}$ (1.916) | Full Mediation |
| H6d | **Enjoyment -> Satisfaction -> Destination visit intention** | 0.037$^{NS}$ | | | No Mediation |
| H5e | **Escapism -> Immersive Experience -> Destination visit intention** | 0.051* | 0.077$^{NS}$ | 0.157* (2.303) | Full Mediation |
| H6e | **Escapism -> Satisfaction ->** | 0.029$^{NS}$ | | | No Mediation |

| | | | | | |
|---|---|---|---|---|---|
| | **Destination visit intention** | | | | |

**Notes:** ***p < 0.001, **p < 0.01, (*) p < 0.05, NS not significant.

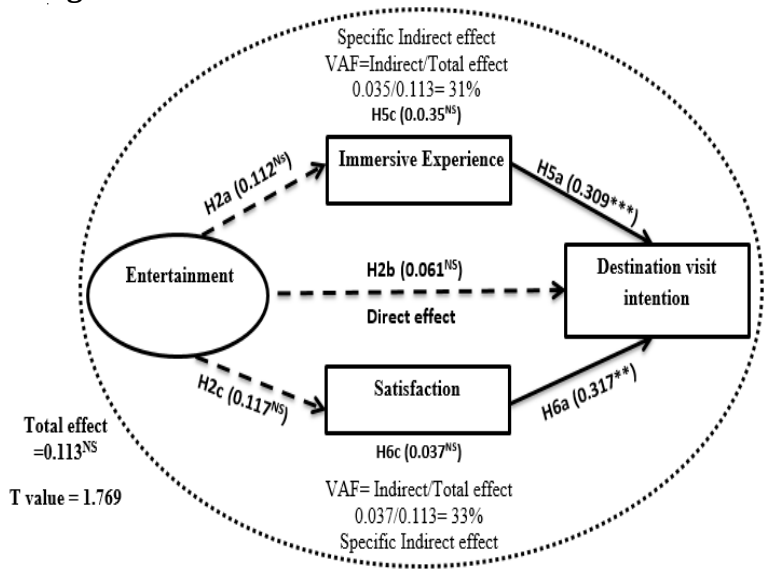
Table 7 clarifies the results of indirect and total effects of the experiential value of augmented reality as independent variables (visual appeal, entertainment, enjoyment, and escapism) on dependent constructs (destination visit intention) through two mediators: immersive experience and visitor's satisfaction. As shown in Table and Figure 7, the indirect effect (0.083) of visual appeal —> destination visit intention through immersive experience as a mediator is significant, in which the t-value of 5.645 and p-value of 0.000. On the contrary, the direct effect (0.068) of visual appeal —> destination visit intention is quite weak compared to the indirect effect because the visual appeal had a negative impact on destination visit intention (t = 0.993, p >.05). Thus, we accept our mediator (immersive experience) hypothesis (H5b). Similarly, the second mediator of the visual appeal (the visitor's satisfaction) also has a significant impact, in which the indirect effect of visual appeal —> destination visit intention was (0.177). Hence, we accept our mediator (visitor's satisfaction) hypothesis (H6b).

**Figure 7 Multi Mediation Model for Visual Appeal**



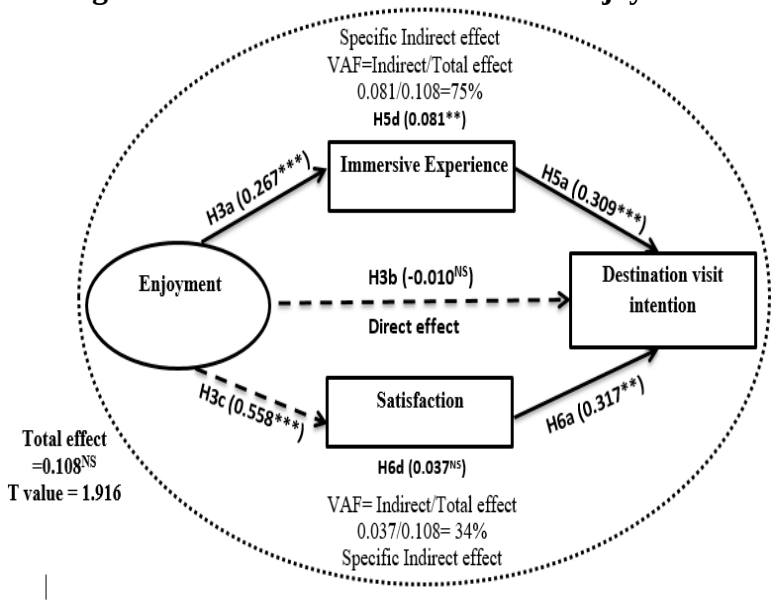

On the other hand, entertainment through study mediators "immersive experience" and "visitor satisfaction" has no significant indirect (0.035, 0.037) or direct (0.061) effects on destination visit intention, in which the t-value and p-value were 1.769 and p >.05, respectively. Thus, we reject H5c and H6c. As shown in Figure 8.

**Figure 8 Multi Mediation Model for Entertainment**



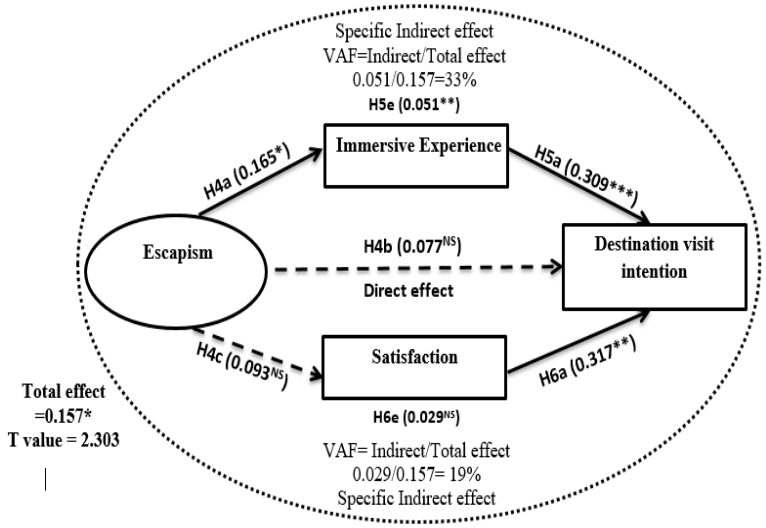

Specifically, immersive experience mediated the relationship between enjoyment and destination visit intention, in which the indirect effect was 0.081, while the direct effect was 0.010 ($t = 1.916$, $p > .05$). So we accept H5d. Conversely, H6d has been rejected due to it has not significant indirect or direct effects on destination visit intention.

**Figure 9 Multi Mediation Model for Enjoyment**




In the same context, immersive experience mediated the relationship between escapism —> destination visit intention, in which the indirect effect was 0.051, while the direct effect was 0.077 ($t = 2.303$, $p < .05$). Which means that the direct effect is quite weak compared to the indirect effect, Therefore, we accept immersive experience as a mediator (H5e) and reject visitor's satisfaction (H6e).

**Figure 10 Multi Mediation Model for Escapism**




## Discussion

The main goal of the current study was to investigate the effects of exogenous variables such as visual appeal, entertainment, enjoyment, escapism, visitor satisfaction, and immersive experience on destination visit intention as an endogenous variable. The empirical findings revealed that mediators of the current study have a significant positive influence on the dependent variable (destination visit intention), the immersive experience (β= 0.309, t = 3.829, p <.001), and the visitor's satisfaction (β= 0.317, t = 3.404, p <.01). Hence, H5a and H6a were accepted.

It is worthwhile to mention that variables of the experiential value of augmented reality do not have significant positive effects on the dependent variable (destination visit intention), in which visual appeal (H1b) was β=0.068, t =

0.993, p >.05, entertainment (H2b) was β=0.061, t = 0.899, p >.05, enjoyment (H3b) was β=-0.010, t = 0.204, p >.05), and escapism (H4b) also was β=0.077, t = 1.219, p >.05), which has given significant importance to the role of the mediator in this study. This means that by providing an immersive experience to the visitor and ensuring his satisfaction at the heritage sites, this enhances his intention to visit the destination. These results are in line with the findings of Atzeni et al. (2021), in which immersive experience was found to be an important indicator of destination visit intention. Additionally, Rasoolimanesh et al. (2021) revealed that visitors' satisfaction had a significant effect on destination visit intention.

The study findings show that the visual appeal, enjoyment, and escapism of augmented reality at heritage sites enhances visitors' experiences and increases their satisfaction. This positive attitude leads them to have powerful feelings towards visiting heritage sites. One noteworthy result is that the entertainment value of augmented reality was given lower priority than other exogenous variables (visual appeal, enjoyment, and escapism), in which entertainment had no positive impacts on two mediators: immersive experience (β=0.112, t = 1.654, p >.05), visitor's satisfaction (β=0.117, t = 1.927, p >.05), and also the dependent variable (destination visit intention) (β=0.061, t = 0.899, p >.05).

Regarding mediation analysis, the study results have clarified that the indirect effects (0.083) of visual appeal—> destination visit intention through immersive experience and visitor satisfaction (0.177) are significant and positive. On the contrary, the direct effect (0.068) of visual appeal—> destination visit intention is quite weak compared to the

indirect effect because the visual appeal had a negative impact on destination visit intention (t = 0.993, p >.05). Thus, we accept H5b and H6b, and the study mediators become full mediation. As we mentioned above, entertainment through study mediators "immersive experience" and "visitor satisfaction" has no significant indirect (0.035, 0.037) or direct (0.061) effects on destination visit intention, in which the t-value and p-value were 1.769 and p >.05, respectively. Thus, we reject H5c and H6c, and the study mediators become zero mediation. Whereas immersive experience mediated the relationship between enjoyment and destination visit intention, in which the indirect effect was 0.081, while the direct effect was 0.010 (t = 1.916, p >.05). So we accept H5d and immersive experience as a mediator has become full mediation, while H6d has been rejected due to it has no significant indirect effects on destination visit intention. Thus, visitor satisfaction as a mediator has become zero mediation. Similarly, immersive experience mediated also the relationship between escapism —> destination visit intention, in which the indirect effect was 0.051, while the direct effect was 0.077 (t = 2.303, p <.05). Which means that the direct effect is quite weak compared to the indirect effect, Therefore, we accept H5e and immersive experience as a mediator has become full mediation, and H6e has been rejected because it has no significant indirect effects on destination visit intention. Thus, visitor satisfaction as a mediator has become zero mediation.

Furthermore, a significant effect of the immersive experience on destination visit intention (H5a) and visitor satisfaction (H6a) was found in this study. The $f^2$ effect results illustrated that the prediction power of immersive

experience is stronger for destination visit intention than for visitor satisfaction. These results suggest the higher the immersive experience, and subsequently, the higher the intention to visit a destination. These findings are also consistent with previous research findings at tourism destinations, such as immersive experience and destination visit intention (So & Kim, 2013; Jung et al., 2016; Han et al., 2018; Avci, 2019; Serravalle et al.,2019; Loureiro, 2020; Atzeni et al., 2021; Trunfio et al., 2022; Jiang et al., 2022), and visitor satisfaction and destination visit intention (Yuan et al., 2008; So & Kim, 2013; Jung et al., 2016; Tahyudin & Saputra, 2017; Genç, 2018; Wakefield et al., 2019; Tsai, 2020; Shin & Jeong, 2021; Rasoolimanesh et al., 2021; Trunfio et al., 2022).

## Conclusions

This research has specifically tested the effects of the experiential value of augmented reality (visual appeal, entertainment, enjoyment, and escapism), immersive experience, and satisfaction towards visitor intention to visit the destination. The results of this study show that immersive experience has been significantly affected by visual appeal, enjoyment, and escapism, whereas visitor satisfaction has been affected only by visual appeal, and likewise, mediators (visitor satisfaction and immersive experience) have significantly affected destination visit intention. These results provide important research implications help to create the intent to visit the destination, specifically focused on heritage destinations.

## Theoretical and Practical Implications

In prior tourism studies, no study has been able to integrate and test the six independent variables (visual appeal,

entertainment, enjoyment, escapism, immersive experience, and visitor satisfaction) that are mentioned in the current study, especially at heritage destinations. Most of them have focused on the relationship between immersive experience and destination visit intention (So & Kim, 2013; Jung et al., 2016; Han et al., 2018; Avci, 2019; Serravalle et al.,2019; Loureiro, 2020; Atzeni et al., 2021; Trunfio et al., 2022; Jiang et al., 2022), and visitor satisfaction and destination visit intention (Yuan et al., 2008; So & Kim, 2013; Jung et al., 2016; Tahyudin & Saputra, 2017; Genç, 2018; Wakefield et al., 2019; Tsai, 2020; Shin & Jeong, 2021; Rasoolimanesh et al., 2021; Trunfio et al., 2022). There are only two studies that have indicated the effect of the experiential value of augmented reality on visitor experience in museums (Jung et al., 2016), and on supporting visitor behavior to conserve heritage destinations (Han et al., 2021). As a result, this study offers a number of major theoretical implications for tourist behavior research, especially at heritage destinations.

Recently, most historic destinations have competed in order to acquire the biggest segment of the tourism market (Trunfio et al., 2022; Jiang et al., 2022). As a consequence, the results of this research have provided policymakers and marketers in Egypt with more knowledge and practical implications for historical tourism. The outcomes have shown that immersive experience and visitor satisfaction are of the utmost significance in enhancing the visitor's intention to visit the historical destinations. These results are in line with the findings of Atzeni et al. (2021), in which immersive experience was found to be an important indicator of destination visit intention. Additionally, Rasoolimanesh et al. (2021) revealed that visitors'

satisfaction had a significant effect on destination visit intention. Thus, marketers at historical destinations must pay close attention to augmented reality technology in order to boost Egypt's historical position in the tourist market. Moreover, visual appeal, enjoyment, and escapism in this research were also found to be powerful predictors of immersive experience and visitor satisfaction. This means that immersive experience and visitor satisfaction are both important mediators of destination visit intention. Historical destinations in developing countries like Egypt still need innovative ways to present their archaeological sites in an attractive manner to attract potential tourists and keep current tourists.

## Limitations and Future Research

The first limitation, the subject of the study is based on direct contact with tourists to view some archaeological sites via augmented reality glasses (3D VR headset) and apps and sites that support augmented reality in Egypt. This process takes about 12 minutes to watch a clip about the archaeological site through augmented reality technology before filling out the questionnaire. Secondly, the direct relationship between immersive experience and visitor satisfaction was ignored in the proposed model due to reporting direct relationships between them in prior literature (Serravalle et al., 2019; Loureiro, 2020; Atzeni et al., 2021; Trunfio et al., 2022). Thirdly, the limited number of studies that mentioned the experiential value of augmented reality at historical destinations (Jung et al., 2016; Han et al., 2021). This deficiency contributed to a scarcity of measurement items related to exogenous variables. The future study plan is to test the data

empirically using other mediating and moderating factors in another proposed structural model in this same context.

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