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Reporting Research 5 – reviewing an augmented reality experience at a heritage sites

The use of, and engagement with, modern technology is now widespread at museums and galleries, as well as heritage, cultural and natural sites. Such technologies can include portable and personal devices such as smart phones, tablets and even small wearable devices notably smart watches and glasses (Tussyadiah *et al*., 2018). The role of these devices in everyday life is well documented and increasingly academic studies are looking at their value in informing and enhancing the on-site visitor experience. The opportunity such devices provide to increase information provisioning, support navigation and orientation (using GPS apps), provide language services (using translation apps) as well as interactive interpretative experiences is staggering (Tussyadiah *et al*., 2018). Whilst such technologies continues to provide fun and entertainment they also have the 'power' to energise the site in a very 'real way' engaging visitors with it and its inhabitants whom can literally 'come to life' in front of them.

Virtual reality (VR) and augmented reality (AR) are two of the technological advances which are now widely adopted. Their use can help to enhance the visitor understanding of the significance and importance of the site but also aid the decision making process as well as encouraging and guiding appropriate on-site behaviours.

Virtual reality (VR) applications can 'augment and afford experiential understanding via interaction' in a way which may not always be possible on a site (Champion, 2008:210). Augmented reality (AR) is a 'visualization technique which superimposes digital images, sounds and text-based information on top of a real-world view of the site' (Kounavis *et al.*, 2012:2; Tussyadiah *et al*., 2018). Haptic communication (through touch) can also be possible using these technologies. There are three key elements to a VR or AR experience and these typically include:

1. Visualisation of the site and its inhabitants at a particular point in time through virtual and/or augmented walking experiences;
2. Immersion (both social and cognitive) into the experience through sights, sounds and smells;
3. Affective involvement in the experience through well-designed activities which offer a degree of control over the experience by the visitor.

A recent study by Chung *et al*. (2018) investigated visitor satisfaction, attitudes and behavioural intentions as a result of engaging with AR at a royal palace, the Deoksugung Palace, located in Seoul, Korea. The research investigated the value of a mobile application called "Deoksugung in my Hands" which provided visitors with high-quality historical and 'point of interest' information using photos, videos as well as 3-D images of current and non-existing buildings (Chung *et al*., 2018:635; Korea Tourism Organization, 2018).

An important part of the research was to explore the visitors' aesthetic experience. Chung *et al.* (2018) argue that this is particularly important given the limitations of many mobile devices in terms of their display and resolution by comparison to a home PC.

The research tool for the study consisted of 34 statements, each measured on a Likert scale ranging from strongly disagree (1) to strongly agree (7). The statements were arranged in groups (see Table 1 below). 145 responses were obtained. 94 (64.8%) were female and 51 (35.2%) were male. 102 of the respondents (70.3%) were aged under 30, of which 87 were students (60%). 108 (74.4%) had a university / college education. Despite this, only 48 (33.1%) had ever used AR at a site before. Some of the key results in relation to the statements are presented in Table 1 below.

Table 1. Responses of visitors to the Likert statements (adapted* from Chung *et al.*, 2018:638).

Notes: * The Likert statements listed have been abbreviated to reduce the space needed in the Table.
** The weighting is an indicator of significance, a higher score indicating greater significance.

Group 1: Expectation confirmation (Mean score for the group: 4.726)	**Weighting**	**Group 2: Perceived advantage** (Mean score for the group: 5.490)	**Weighting**
The service level provided was better than I expected*	.854**	Using the app I can visit more effectively	.925
My experience of using the app was better than I expected	.844	I feel I will be able to get more information during my visit	.892
My expectations from using the app were confirmed	.844	I find the app useful	.887
Group 3: Aesthetic experience (Mean score for the group: 5.508)	**Weighting**	**Group 4: Perceived enjoyment** (Mean score for the group: 5.372)	**Weighting**
Just being there was very pleasant	.907	I enjoyed using the app	.924
The setting was not bland	.901	I had fun using the app	.911
I felt a real sense of harmony	.868	Using the app did not bore me	.871
Group 5: Satisfaction with the AR app (Mean score for the group: 5.112)	**Weighting**	**Group 6: Attitude towards the location** (Mean score for the group: 5.352)	**Weighting**
Satisfied with the quality of information	.904	Using the app has been very educational	.897
Satisfied with the visual interface design	.882	Using the app was a real learning experience	.885
Satisfied with the system stability and speed	.847	Using the app has stimulated my curiosity to learn new things	.856
Group 7: Behavioural intentions towards the location (Mean score for the group: 5.859)	**Weighting**		
I think I will visit again having used the app	.903		
I will continue to visit in the future	.880		
I want to recommend the location to others	.836		

The study suggests that overall satisfaction with the visit was indeed linked to satisfaction with the AR app. App linkage to a positive attitude towards the site, as well as an 'intention to return' was also proven. However, the aesthetic experience of the app appeared to relate more strongly to overall satisfaction, than the perceived enjoyment of using it.

The use of VR and AR experiences has raised a number of concerns in recent years and some of these are briefly noted below:

1. Some apps continue to offer an over-emphasis (even as a 'fantasy') on the presentation of the site, its inhabitants and their experiences rather than promoting a deeper understanding of these events;

2. Many visitors still require a briefing on how to use such apps which means academic studies struggle to gauge a more 'spontaneous' response to the use of, and interest in, an app;
3. Demographics remain a challenge, with young, well-educated and highly interested visitors still more willing to accept apps, meaning that truly random sampling has still yet to be fully achieved in many settings;
4. An obsession with technology means that some visitors might 'miss the point of the experience' because of their interest in the design of the app itself;

Suggestions for further research include looking at downloading activities (prior to arrival), the speed of mastering an app as well as on-site behaviours linked to app-directed activity.

Modern technology has the capability to bring experiences and events 'to life' which can be truly mind-blowing but that does not mean that the visitor has understood or even fully appreciated their significance. A number of academic studies have revealed that visitors often remember more about the technology itself and the way it is presented than they do about the actual experience and that is the challenge going forward.

(868 words + Table 1)

References

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