Handheld Devices:
Do they offer the educational and lifelong learning opportunities within a pleasant and enjoyable experience that the visitors seek for?

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Abstract

In a fast paced media-driven world where ubiquitous computing dominates, New Technologies cannot be excluded, especially as it is proved that when technology is properly applied, it can offer visitors multi-sensory experiences. Handheld Devices, as part of New Technologies, have been proved to enhance education and lifelong learning within a pleasant and enjoyable museum experience, although many arguments still exist. The Panathenaic Stadium in Athens and the Achilleion Palace in Corfu are the two case studies of the research that was conducted so as to dilute the arguments, as well as to minimize any flaws and disadvantages that Handheld Devices might have.

Keywords: Handheld Devices, learning.

Introduction

Initially, museums were nothing more than rooms filled with material remains that gave evidence to finite cultures, and offered their visitors minimum participation in the interpretation process resulting in an experience that was passive and static. However, contemporary visitors are no longer satisfied by merely admiring the exhibits, they seek for educational and learning opportunities within a pleasant and enjoyable experience (Economou, 2003). This approach, in a fast paced media-driven world where ubiquitous computing dominates (Weiser, 1993), cannot exclude New Technologies and Handheld Devices (HD) as part of them, especially as it is proved that when technology is properly applied, it can offer visitors multi-sensory experiences, while allowing interactivity and communication between the visitors and the museum. (Bounia et al, 2008; Kalay et al, 2007)

According to Loïc Tallon, co-editor and writer of the *Digital Technologies and the Museum Experience,* the HD have three defining qualities: "they are mobile in that they are location independent, available anytime, anywhere; they are digital in that their functionality is based on an electrical system that uses discrete values; and they are personal in that there is one-to-one relationship between the visitor and the medium, with the visitor in control." (2008: p.xviii) The main reason that visitors choose a HD is for the information that can be gained from it, since it is programmed for intelligent interactiveness, transforming each exhibit into a gateway towards knowledge and history by serving the user in a simple, dynamic and above all synergistic way (Rizopoulos, 2008). Moreover, no matter how broad the amount of information is, it is presented in different layers ranging from general-basic information to detailed thorough documentation (Beach, 2003). Notwithstanding, the option of autonomy offered to the guests, as anyone can cross his/her own unique path through the exhibition according to their needs and desires, is essentially a guarantee for a personalised tour for various types of visitors.

Museums are typical informal learning environments (Hooper-Grenhill, 2000); Recent studies has shown that only 6% of visitors retain information from labels, in comparison to more than 30% of them that retain information from audio guides (Lucas, 2000), since during the learning experience all senses actively participate. In particular, a percentage of 83% is owed to vision and 11% to hearing (Vakaloudi, 2001), namely contemporary audio-visual tools enhance learning in museums, as learning is an empirical and experiential procedure that is based on exploration. The idea of an interactive relationship has its roots in the philosophies of constructivism and the core of it is related to the adequacy of the internal process of understanding and reflected energy; in other words, the activation of inner, spiritual and mental reflexes of the visitor. (Roussou, 2008) Piaget highlights that by interacting visitors can be inspired and exploit their spontaneity, by combining imagination with logic and helping them to discover things on their own and at their own pace (1973). The studies of Malone and Lepper (1987) focus on the relationship between motivation and learning, thereby distinguishing the elements of challenge, curiosity, imagination and the ability to control. In other words, contemporary educational approaches conclude that learning could happen easily in an enjoyable and challenging environment that promotes engagement and understanding; a state that was shown from visitor research conducted by Schneider and Cheslock (2003).

Just a decade ago Eilean Hooper-Greenhill observed that the contemporary museum is democratic as it promotes polyphony of views, experiences and values, and she had foreseen that "The museum in the future may be imagined as a process or an experience." (2000: p.152). Even though many reasonable suspicions still exist accusing HD as being a source of disorientation and abstraction from the essential participation (Samis, 2007), many research has proven that the HD, as part of the "augmented reality experience" (Schwarzer, 2001), has positive effects on the overall museum experience. We have seen that the multiple activities in combination with the range of the digital tools offer visitors multiple entry points and engagement trajectories (Giaccardi, 2007). From all of the above we can conclude that interaction is the experience during which visitors can actively participate in a physical, emotional, spiritual and social way, in order to rediscover the charm and charisma of the objects (Adams and Moussouri, 2002)

No matter what is theoretically believed, there is no one more sufficient than the visitors themselves to answer if and how HD are capable to benefit them and which are the characteristics that should be avoided in order to minimise the effects of the flaws (Economou, 2003). Therefore, the objective of this survey was to understand the visitors' needs related to the HD used in two Greek cultural institutions and what benefits, if any, do they offer to the overall museum experience.

Methodology

The Panathenaic Stadium and the Achilleion Palace are the two research sites that had been chosen, due to their basic similarities as well as differences that enabled the research on them to provide us effectively with some fundamental aspects. The Panathenaic Stadium (PS), is located in the centre of Athens and was built on the ruins of an ancient stadium of the 4th century BC, to host the first modern Olympic Games in 1896. Throughout the 20th century the PS hosted diverse events, until 2010, when it reopened in order to offer a special experience to its visitors. PS welcomes approximately 6.000 visitors per month with the aid of the audio guide that is included in the ticket price and is provided in 9 different languages. (Panathenaic Stadium; Vouvakis, 2010)

The Achilleion Palace (AP) is located on the island of Corfu and was built on the request of Empress Elisabeth of Austria. After her death Kaiser William II of Germany

bought it, but during both World Wars it was occupied and unfortunately looted. After many years of reconstruction it was restored and became accessible to visitors. Over 500.000 individuals annually visit the AP and approximately 6.000 per month choose to be guided through the audio guide that is provided in 9 different languages, after paying an additional fee from the entrance ticket. (Achilleion Palace; Vouvakis, 2010)

After a thorough literature review, I conducted an on-site research of the two HD at the PS and the AP. Moreover, I interviewed the HD designer, Mr. M. Vouvakis, and I formed a questionnaire, which was placed on the sites for six weeks during the summer (3 July-15 August 2010), as visitations during this time period increases. Every third visitor that used a HD was requested to fill in the questionnaire, as a statistically random sample assures a result that reflects the overall opinions of the visitors (Fink, 1995).

The questionnaire pertained closed ended questions, offering options of answers gathered from questionnaires that were used in previous researches as well as possible answers that I deemed necessary for a more holistic approach. However, almost all of the questions had as a final option the answer 'other', where visitor could add their personal opinion that was not included, as well as any comment they wished to express. Moreover, at the end of the questionnaire there was a space for an overall general comment. These comments were also be analysed in order to compare them and find any interesting observation and suggestion. The questions were divided into three major categories: demographic questions, so as to discover the visitor's profile; the second category aimed at presenting the visitors participation in museums; and the main category included questions related to the HD.

Responses – Analysis

After a six week period the questionnaires that had been filled in by the visitors of the PS and the AP were 92 and 48 respectively. Even if both sites have the same visitation the PS gave us a satisfying number of responses, whereas it proved challenging to gather responses from the AP. The analysis for both sites had been conducted with the reservation that it would result in more accurate conclusions if the number of the responses were equal to those from the PS. Moreover, in order for the analysis to be accurate, without allowing the statistically significant differences (Agresti, 2007) among the groups to interfere with the results, the differences were eliminated by combining similar groups together. Another issue that occurred during the analysis is that, as visitors had the opportunity to select more than one answer on various questions, it would be impracticable to analyse all the possible combinations without falling in the previous limitation, therefore I measured the frequency of the answers proportionally, and only noticed the situations that distinguished.

The overall sample consists of 140 visitors; Both monuments were found to be more popular among women, while the age distribution is more or less as expected, overall 66% are aged between 18-34, and the remaining 34% radically decreases in age groups that follow. This can be concluded by the fact that younger generations are more likely to be engaged with the HD (Tallon, 2008). Furthermore, the educational background reflects balanced results; 28% have a basic education, 56% have fulfilled academic studies, while 16% belong to the upper educational level. In addition, the demographic question that was meant to find the visitors' nationality proved that the majority of the visitors are from countries of the European Community.

After examining the visitors' profile, their participation in museums and other cultural institutions is analysed; unfortunately, over half of the individuals visit cultural spaces once or even less than once annually, 23% once every six months, and the remaining 23% are considered more frequent visitors. From the above, 84% answered the following

question; *If you do not visit museums and other cultural institutions often, what is/are the reason/s?* 53% claimed lack of time, moreover 11% selected the option 'other', from which over half commented that they only visit these sites during vacations. In fact, this response is of a higher percentage at the AP which is located on an island, thus it was expected to be more popular as a holiday excursion. The remaining 36% stated lack of interest or that they found them unfriendly and/or inaccessible. Institutions should be concerned with this high percentage, as it reflects that these visitors in all probability had a previous negative experience. The question that follows aims at comprehending visitors' motivations (fig.1); one visitor in particular selected 'other' and commented that he visits these spaces when there is something new and interesting to see. The majority though said that learning and education is their motivational reason, and actually almost half of them selected only this answer, whereas the rest combined it with one or more of the other options; entertainment, aesthetic and relaxation reasons; and other, such as professional reasons or opportunity for socialising.

In order to understand if visitors could operate the HD three questions were presented which found that; only 4 visitors in both sites encountered difficulties, moreover 85% of the users at the PS and 70% at the AP preferred the HD to operate with numbers and signalling, instead of the automatic activation via infrared. In fact, a visitor at the PS commented that she prefers to be able to press numbers to get informed at her own pace or because she might want to listen to the same track for a second time. The difference between the two sites might be due to the 66 tracks and points of interest at the AP, in comparison to the 17 tracks at the PS. Therefore, we can conclude that almost everyone was able to handle the HD. The last question of this group asked under which criteria they choose a HD; 17% answered features such as size, weight and design, while the majority chose the quality of the guide and 36% selected the HD according to the price.

The next group of questions refer to the information provided by the HD; from the first question (fig.2) it is shown that 24% of the visitors seek basic information, from which 14% selected only this answer, while the others combined it with: information about the technique and method of creation, subject and history of the exhibit and the historical background and context. As it concerns the form of presenting the information, over half of the visitors preferred simple presentation, as opposed to theatrical narration. This contrasts with Peter Samis' opinion (2007); that a variety of voices is a friendlier approach, thus the theatrical narration would be expected to be more popular. The visitors who preferred the theatrical narration are justified by the percentage derived from the question that requested which additional features would enhance their tour; such as the musical background and the quotes from the creators or the critics. Other additional features that visitors would prefer are texts relating to the exhibits, images of the exhibits themselves or other similar images. However, almost 10% of the visitors selected 'other' and stated that they would not add anything, as they enjoyed the HD just as it was offered.

Two additional questions concerning the information offered was whether they listened to all the tracks and if not, why. At the PS 70% of the visitors listened to all the tracks, while only half listened to the entire track at the AP. This is excused due to the fact that the AP supplies 66 tracks which would require more than two hours of the visitors time, which was confirmed by the answers in the following question; over 40% stated that the information at the AP is excessive and that they felt that they had enough background information without listening to it in its entirety, whereas the results at the PS are almost equally divided among lack of time, interest, excessive information or weariness. Another option that was not foreseen was the bad quality of the sound (16%); after all, no matter how

high the quality of the information and the other applications are, technology is never beneficial when it does not function accurately.

Communication and human interaction is also examined via two questions; almost half of the visitors communicated with their co-visitors, while 23% communicated with other visitors and/or the employees of the monuments. However, 28% of the visitors did not communicate with anyone at all, and this cannot be justified by the percentage of the visitors that visit these spaces on their own (10%), while the remaining percentages found that are accompanied by their families, friends, partner, etc. Actually, even some of those who visited the PS and the AP on their own managed to communicate with other visitors or employees. This is a disturbing percentage that justifies the worries and arguments that HD could isolate the visitor in front of a screen that focus on the voice coming from their earphones, unfurling an antisocial behaviour by setting fundamental barriers to social exchange (Samis, 2007).

After analysing the questions that refer to specific aspects of the HD, questions follow that specifically focus on the individuals' opinions concerning their entire experience with the HD. The majority of the visitors found the experience educational, enjoyable and added some positive comments such as fun, amazing and perfect. If we observe the table (fig.1) we will notice that the visitors' motivations were managed to be met, according to these results. Moreover, this table presents visitors' opinions about traditional labelling; here, as well, we have positive results, although the negative outcome is much higher. Actually, a visitor commented that the labels are interesting and enlightening, but only when they are concise; and another visitor characterised them "educational, but boring". Therefore, by comparing the responses concerning the visitors' motivations, the characterisation of the HD and the labelling we may conclude that, not only did the HD manage to meet the visitors' expectations and desires; it also was able to decrease the negative effects of the labelling.

These, conclusions can also be drawn from the rating of the overall experience with the HD, as well as from the visitors' preference in the way they choose to be guided in a future visit, the responses of which are measured according to the results of the users and non-users. The survey reveals a substantial difference among visitors of the PS and AP who have had prior experience with such a device: 70% of the visitors from the PS has used one before, as compared to the 38% of the visitors from the AP. Overall 60% are users and the remaining 40% used the HD for the first time at these research sites, namely they are non-uses. The users as well as the non-users at both the PS and the AP rated the HD between 8.5 and 8.7, with the non-users being more generous. Overall, 90% of the visitors would choose again a HD in a future visit, whereas only 10% would prefer the traditional tour or a book to be guided.

Discussion

The analysis that preluded presented the results of the closed ended questions as well as the comments that visitors stated. Overall, almost 42% of them supplemented the answers or added a general comment by using the space at the end of the questionnaire. The majority of the additional answers have already been categorised and mentioned above, while the general comments made by most of the visitors used a single word or a small phrase to describe their museum experience accompanied by the HD; beautiful, excellent, terrific, outstanding, fantastic, well balanced etc. Others felt the need to thank and/or congratulate for the HD offered to them. In general, the comments highlighted the positive effects of the HD, while the negative mainly focused on the quality of the device. From the totality of the comments only one referred to the type of the information provided by the HD; a man at the

PS felt that the introductory track by Mr. Kapralos, president of the Hellenic Olympic Committee (HOC) was an action of vanity. However, this is a unique cynical comment about the information provided; moreover it was not supported by any other explanation or the overall view of this man.

Another flaw that was mentioned by the visitors as well as concluded by the limited participation on the questionnaires at the AP is the price of the HD. Namely, the price of renting a HD was a major criteria when deciding whether to use the device. Further comments supported this notion from visitors that added the cost in the reasons why they are disinclined from visiting museums and other cultural institutions more often, and another visitor from the AP commented that he enjoyed the visit but it was too expensive. Therefore, the cost of the entire visit, especially nowadays, is a major factor that dissuades individuals from these spaces and from completing their museum experience.

Regardless of the flaws and limitations, 90% of the visitors would choose again in a future visit to be guided by a HD. This proves that they can gain the visitors attention and, instead of holding it fast, as Graham Black initially feared, it encourages visitors to commit to the overall museum experience (2008). Moreover, since 63% of the visitors listened to all the tracks, it means that they spent more time at the monuments than they would without the HD, as previous research has found that visitors tend to spend more time while interacting with New Technologies. Hence, the interaction provided by the HD offers visitors the opportunity to effortlessly engage with the monuments. Furthermore, since the services and applications of the HD managed to fulfil the visitors' needs and expectations, then they can be characterised as successful, by modifying the museum to an attractive environment that equally promotes learning and entertainment through the interaction and the active participation of the visitors in the museum experience.

In particular, apart from the expected motivations, a visitor stated that he visits museums and other cultural institutions when there is something new and interesting to see. Jenny Holzer, a conceptual artist, in her work *Truisms* stated that 'everything new is interesting' (1977). Videlicet, only everything that is new is interesting, or can cultural heritage when seen through a new and innovative optical view, such as the one provided by the HDs still cause interest. According to visitors feedback, HDs can supply them with an interesting and meaningful experience. Some distinguished comments were:

'It was a unique experience that I had not imagined.'
'Enlightening, interesting, entertaining; without the HD it would not be the same'
'I felt privileged to be able to wonder around so freely. The HD complemented this perfectly.'

Conclusion

From the 140 responses that were gathered, it is concluded that people seek learning opportunities, as well as entertainment. This contemporary visitor's profile is compatible with innovative technology that is why only few individuals mentioned that they had difficulties handling the HDs. From this we can deduce that they were able to interact, on a first level with the handheld device itself, and secondly with the information provided by it. Visitors are interested in basic information, as well as more thorough details, additional to those supplied; moreover, they require multimedia features, such as music and images that would enhance their guide transforming their experience.

The objective of this research was to understand the visitors' needs related to the HD and what benefits, if any, do they offer to the overall museum experience, however visitors' responses slightly shifted this, since their main reason for visiting a museum is learning opportunities and the answers referring to the HD focused on its educational

character. Moreover, in the process of the research, more questions arose and need to be further researched; namely, which is the exact association of all these aspects with the interactivity needed in order for a HD to allow visitors engagement. Throughout the book, *The Engaging Museum. Developing Museums for Visitor involvement,* Graham Black (2008: pp.266-288.), strives to define the engaging museum. After a thorough research G. Black concluded that the engaging museum is the one that urges visitors to view their visit as a journey and a conversation that they want to participate in. Moreover, the engaging museum promises and/or contracts to respond to the needs and expectations of all their visitors and support people during their exploration. Therefore, HD benefit visitors participation in a dual route; the literal route inside the museum or the other cultural institution, as well as the metaphorical route on a spiritual level which visitors need to follow in order to encounter their heritage.

According to the results only when HD are used in a proper and wise way can they actually benefit visitors. Enjoyable learning through interactivity is rendered to the visitors' awareness by being engaged in something welcoming, familiar, as well as special and of the highest quality. However, the research did not conclude that handheld devices are the modern Deus ex machina (Panousis, 2003), nor that they reinvented the subsistence of heritage. Handheld devices offer more or less the same opportunities with conventional media, but do so in a faster, easier and more intense way. If handheld devices are used effortlessly and without interfering with visitors, they then can help them meet their needs and expectations through an enriched, unique museum experience.

List of Figures

	Responses	Panathenaic Stadium	Achilleion Palace	Overall
Motivation	Learning - Education	40%	39%	40%
	Entertainment	27%	32%	39%
	Aesthetic Reasons/Relaxation	25%	13%	21%
	Other	8%	16%	10%
HD	Educational	32%	43%	36%
	Enjoyable	27%	18%	24%
	Interesting/Other	39%	36%	38%
	Complicated/Tiring/Boring	2%*	3%*	2%*
Labels	Enlightening/Interesting/Educational	45%	50%	47%
	Satisfying	42%	13%	31%
	Boring/Incomplete/Tiring/ Hard to Understand	13%	37%	22%

Figure 1 Table for motivation, Handheld devices, Labels.

	Responses	Panathenaic Stadium	Achilleion Palace	Overall
Information Preferred	Basic	23%	25%	24%
	Technique/Method of creation	13%	10%	12%
	Subject of the exhibit	13%	22%	16%
	History of the exhibit	23%	32%	27%
	Historical background & context	27%	11%	21%
Additional Information	Background music	15%	23%	18%
	Text related to the object	16%	28%	20%
	Quotes from the creators/critics	20%	15%	18%
	Images	32%	34%	33%
	Other	17%	-	11%

Figure 2 Table for the information provided.

*Differences among groups statistically significant at p<0.05 (chi square)

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