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# DESIGNING FOR ENJOYMENT AND INFORMAL LEARNING: A STUDY IN A MUSEUM CONTEXT

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## Abstract

*This study reports a qualitative exploratory study from the end users' perspective of the design of websites that encourage enjoyable web experiences and informal online learning. As the mission of museums is to provide the general public with educational materials for study and enjoyment, museum websites offer an excellent opportunity to study learning environments designed for enjoyable web experiences. The concept of enjoyable online learning experiences – specifically when learning is not part of a formal instructional undertaking – has not been well studied and thus is not well understood. This study seeks to redress this gap in the literature by reporting on hundreds of end users' opinions and perspectives. The study identifies a set of characteristics for encouraging online learning experiences for the general public and suggests a number of conceptual guidelines for developing an online learning website for enjoyment based on the online end user's view.*

*Keywords: Enjoyment of Web Experience, Engagement, Positive Affect, Fulfillment, Informal Online Learning, Website Design, Qualitative Research.*

## 1 INTRODUCTION

Online emotional experiences are attracting not only global attention but are also the target of considerable amounts of research funding. Recently, the European Union launched a 6 million Euro (over 8 million U.S. Dollar) project - Humaine - to investigate the influences of emotional computing (Humaine Association 2010). A number of museums in Scotland and Israel have collaborated with Humaine in the study of museum visitors' levels of emotions and reaction to different types of displays (Zaik 2009). Due to the emerging nature of this research field, theoretical and empirical research on online emotional experiences and their leverage has been characterized as limited and piecemeal (Blythe & Wright 2003).

As interactions are increasingly becoming "online", organizations are now encouraged to pay attention to the positive emotions of website usage, such as enjoyment (Van der Heijden 2004). Enjoyment can be a powerful psychological reaction; we know that a feeling of enjoyment can influence online shopping (Fiore et al. 2005), computer and the Internet usage (Teo et al. 1999; Van der Heijden 2004; Venkatesh 2000), e-Service continuance (Cyr et al. 2007), and mobile commerce (Cyr et al. 2006). However, while these studies have identified the importance of enjoyment, the information systems field is still lacking in research that focuses on how to design for online enjoyment experiences.

Our study seeks to contribute to research efforts aimed at tackling the positive emotion of enjoyment in relation to the non-utilitarian outcome of informal online learning from museum websites. Enjoyment is a complex and multi-dimensional construct (Fischer et al. 1990; Warner 1980) and museums are a fertile ground for this type of exploration.

Museums serve society via the provision of education and enjoyment to visitors motivated by intrinsic personal desires rather than extrinsic motivators for learning (ICOM 2009). The nature of the visitors' motivation is important as it differentiates the online learning focus from other kinds of online learning. Learning on a museum website does not involve formal lectures and does not lead to any degrees or certification, as in formal online education (see Shen et al. 2008). It is also different from organizational training for employees (Wang 2009), which targets increasing organizational benefits via a measurable increase on workforce skills or knowledge.

This study provides a significant extension to conceptual work (Lin & Gregor 2006) that studied the psychological link between enjoyment experiences and informal learning. Here, we are concerned with the enactment of enjoyment as a mechanism to improve learning outcomes. Thus, this paper explores the opinions and perspectives of online end users in order to answer the following research questions:

**RQ1.** *What characteristics of a website encourage enjoyable online learning?*

**RQ2.** *What design guidelines lead to websites that support enjoyable online learning experiences?*

The paper argues that website designers and managers wanting to increase the effectiveness of informal online learning websites should not only regard the functions of usefulness and ease of use, but should also consider the capacity of the website to generate positive feelings and fulfillment among its users. The paper proceeds by presenting the conceptual background and the research approach and then discussing findings before concluding by presenting implications, limitations and recommendations for further research on this emerging field of study.

## 2 THE CONCEPTUAL BACKGROUND

Researchers and designers have studied the effect of online system design features, focusing on important aspects such as performance, effectiveness, or achievement (Schmid 1997). These systems are used for different purposes; for example, online shopping (Kamis & Davern 2005), online marketing (Cyr et al. 2005), and online learning (Rosenberg 2006). However, few studies consider the effect of different design features on users' emotional influences.

Norman (2008) argues for the importance of studying emotional experiences, which can explain and predict how higher level utilitarian and non-utilitarian online outcomes arise. The area of online learning is one in which emotional experiences are particularly important. The psychology literature has noted that whether and how memories are stored in the human brain may be affected by emotional states (Rolls 1990) and that emotions can influence both the recall of such memories and the operation of cognitive processing (Drewing et al. 2006). Given that memory is critical for knowledge enactment, this study works from the premise that online informal learning is also influenced by emotions and in particular by experiences of enjoyment.

In the remainder of this section, we examine the concept of online enjoyment experiences in some detail, looking first at the nature of enjoyment, then the relationship between enjoyment and learning and then finally the limited work in the extant literature that links website design, enjoyment and learning.

## 2.1 Enjoyment Experience

Studies in information systems have devoted attention to the concept of enjoyment (Van der Heijden 2004). The literature presented in Table 1 offers three perspectives in which enjoyment experiences are regarded as: (i) a prior stimulant (antecedent) (Chu & Lu 2007; Davis et al. 1992; Venkatesh 2000), (ii) a transactional element (Cyr et al. 2006, 2007; Fiore et al. 2005; Teo et al. 1999; Van der Heijden 2004; Wakefield & Whitten 2006; Webster & Ahuja 2006; Wu & Chang 2005), and (iii) a consequence (Huang 2003).

Theatrical context	Conceptualization of the enjoyment experience	Results
1. The enjoyment experience (and its related concepts such as playfulness) is regarded as a <i>prior stimulant (antecedent)</i> :	“ <i>this study defined <b>perceived playfulness</b> as the degree to which the consumer believes that <b>enjoyment</b> could be derived when listening to online music.</i> ” (Chu & Lu 2007, p.143)	Perceived playfulness (enjoyment) can positively affect perceived customer value.
	“ <i>... <b>enjoyment</b> refers to the extent to which the activity of using the computer is perceived to be <b>enjoyable</b> in its own right, apart from any performance consequences that may be anticipated.</i> ” (Davis et al. 1992, p.1113).	Enjoyment can positively affect intentions to use computers in the workplace.
	“ <i>Perceived <b>enjoyment</b> is ... defined as the extent to which the activity of using a specific system is perceived to be <b>enjoyable</b> in its own right, aside from any performance consequences resulting from system use.</i> ” (Venkatesh 2000, p.351)	Perceived enjoyment can positively affect perceived ease of use; and perceived ease of use can also positively affect behavioral intention to use.
2. The enjoyment experience and related concepts – pleasure and engagement - are regarded as <i>transactional elements</i> , which are patterns of motor and communicative actions designed to facilitate goal attainment (Ford 1992):	“ <i>Online retail shopping has been suggested to have both utilitarian and <b>hedonic</b> dimensions and that vendors can create <b>aesthetically</b> rich shopping environments that consumers <b>enjoy</b>.</i> ” (Cyr et al. 2006, p.952)	Both design aesthetics and ease of use can positively affect enjoyment; and enjoyment can positively affect M-Loyalty.
	“ <i>..., we expect that if users <b>enjoy</b> a website, they are more likely to have a <b>positive attitude</b> towards it and consequently <b>visit it again</b> or have e-Loyalty towards that site.</i> ” (Cyr et al. 2007, p.46)	Perceived social presence can positively affect enjoyment; and enjoyment can positively affect E-Loyalty.
	“ <i>Interactivity of a website is also credited with providing <b>hedonic</b> benefit of <b>enjoyment</b>.</i> ” (Fiore et al. 2005, p.672); “ <i><b>Enjoyment</b> may arise from the <b>entertaining</b> and creative process involved in developing images of ensembles alone or on the body.</i> ” (Fiore et al. 2005, p.674)	Image interactivity can positively affect pleasure; and pleasure can positively affect global attitude, willingness to purchase, and willingness to patronize.
	“ <i>Individuals may <b>engage</b> in a particular behavior if it yields <b>fun</b> and <b>enjoyment</b>. This implies that individuals may adopt technology because its use is <b>enjoyable</b>.</i> ” (Teo et al. 1999, p.27)	Perceived ease of use can positively affect enjoyment; and enjoyment can positively affect internet usage.

	“..., the definition of perceived <b>enjoyment</b> specifies the extent to which <b>fun</b> can be derived from using the system. Perceived <b>enjoyment</b> strongly influenced Web use for <b>entertainment</b> purposes.” (Van der Heijden 2004, p.697)	Perceived ease of use can positively affect perceived enjoyment; and perceived enjoyment can positively affect intention to use.
	“ <b>Playfulness</b> is an intrinsic motivator that prompts users to <b>engage</b> technology for internal benefits, namely <b>enjoyment</b> . Consequently, highly <b>playful</b> users are likely to expect more <b>enjoyment</b> and have greater usage intentions.” (Wakefield & Whitten 2006, p.294)	Higher playfulness can positively affect enjoyment and usefulness; and higher enjoyment and usefulness can positively affect hedonic mobile usage.
	“..., users who <b>enjoy</b> a computer activity report higher intentions to use it in the future, those with more <b>positive attitudes</b> toward a Web site are more likely to use it, and those with higher intrinsic <b>enjoyment</b> exhibit higher intentions to return to the Web site.” (Webster & Ahuja 2006, p.667)	Lower disorientation would relate to higher user engagement, engagement would relate positively to performance, and engagement would relate positively to intentions to use the Web site in the future.
	“(Flow) as an extremely <b>enjoyable</b> experience, where an individual engages in an online game activity with total involvement, <b>enjoyment</b> , control, concentration and intrinsic interest.” (Wu & Chang 2005, p.940)	Machine interactivity, ability, and integrity can positively affect enjoyment; and enjoyment can positively affect transaction intentions.
3. The enjoyment experience (and its related concepts – hedonic experience) is regarded as a consequence:	“A website performs well in the <b>hedonic</b> aspect when users perceive the site to be <b>enjoyable</b> in its own right, apart from any performance consequences that may be anticipated.” (Huang 2003, p.430)	Flow elements (control, curiosity, and interest) can positively affect hedonic experience.

Table 1. Theorizing on Online Enjoyment Experiences

While the studies in Table 1 provide valuable information, the majority use quantitative methods and focus on theory testing. There is a lack of in-depth qualitative exploration of users’ perceptions of and needs for enjoyment. Further, most prior studies regard the “enjoyment experience” as a uni-dimensional concept. In contrast, this study argues that the enjoyment experience has a number of distinct dimensions and must be treated as a complex phenomenon, as suggested in other research disciplines.

Further insights into the true nature of enjoyment are gained from consulting the work of philosophers, psychologists, and physiologists (e.g. Csikszentmihalyi 1990; Perry 1967; Scanlan & Lewthwaite 1986; Warner 1980). We build on Warner’s (1980) seminal study of enjoyment, where psychological and philosophical arguments are synthesized to present enjoyment in terms of three necessary sub-constructs: *Engagement*, *Positive Affect*, and *Fulfillment*. For people to enjoy an activity, they have to: (a) *engage* in the activity; (b) be *positively affected* in terms of satisfaction, excitement, contentment, or similar feelings; and (c) achieve *fulfillment* of needs or desires through the activity (although these needs may not be consciously realized *a priori*).

## 2.2 The Enjoyment Experience and Informal Learning

Prior work has shown that enjoyment experiences are positively associated with informal online learning and that it is essential to consider particularly the second and third dimensions of enjoyment defined by Warner (1980), *Positive Affect* and *Fulfillment*, in the design of online learning systems (Lin & Gregor 2006). Fulfillment of needs (e.g. acquiring knowledge) leads to the theories of human motivation. Following Ford (1992), we consider that a person has affective needs, cognitive needs, self-assertive social relationship needs and task needs for learning. These needs can generate sufficient cognitive dissonance to direct the attention and thus direct the person toward the fulfillment of his or her needs.

The second dimension of the enjoyment experience, *positive affect*, includes the notions of contentment, gladness, excitement and good feelings. In Ford's (1992) taxonomy of human needs, this dimension corresponds to the affective goals of happiness, bodily sensations, and physical well-being. Enjoyment is linked to learning, because learning satisfies some human needs (Ford 1992). Conversely, enjoyment can act as a positive conducive re-enforcement to positive learning (Blunsdon et al. 2003). Thus, it can be argued that the experience of enjoyment while learning leads to higher levels of learning and to a desire to repeat the enjoyable learning experience. This argument is supported in the educational literature, where positive re-enforcement is held to be more effective than negative re-enforcement (Noell et al. 2000) and a direct link between enjoyment and learning has been established (Grieder et al. 2009; Pekrun 1992).

To be sure, some types of online learning experiences are not necessarily enjoyable, yet people still engage in them. These are usually cases in which learning is extrinsically motivated, for example when learning is forced or undertaken for purely material gain. We argue that visitors to museum websites are likely to have intrinsic rather than extrinsic motives for learning; therefore, making the learning experience enjoyable is particularly important.

### **2.3 Website Features, Informal Learning, and Enjoyment of Web Experiences**

A design experience should consider intention, involvement, and individual participation (Heeter 2000) and features such as interactive multimedia applications, allowing users to interact with systems and enjoy attractive content (Benyon et al. 2005). Thus, users can develop a sense of engagement, positive affect, and fulfillment from using a website. Literature also has noted that different features of a computer system (e.g. interactive multimedia versus text) influence users' enjoyment experiences to different degrees (Nusair & Kandampully 2008; Van der Heijden 2004).

Only a limited number of studies relate to website usage and informal online learning. Informal learning is the outcome of everyday living experiences from which we learn something (Merriam & Caffarella 1999). It can be distinguished by the definition of formal learning, as "*formal learning takes place in educational institutions and often leads to degrees or credit of some sort*" (Merriam & Caffarella 1999, p.21). With regarding to formal learning, Cheung et al. (2003) argues that a well designed multimedia-interactive learning system, which contains the features of usefulness and ease-of-use, can impact the self-efficacy of online learning. Further, some studies have investigated whether online game-based programs might help users to learn complex information (Di Blas & Poggi 2006). Game-based learning can be rewarding in many aspects, such as student learning and understanding, and teaching effectiveness (Gestwicki 2007). However, can similar design concepts be applied to improving informal learning? It is also unclear whether game-based learning is suitable for informal learning, especially for the general public.

To sum up, more knowledge is needed of the design features that encourage engagement, positive affect, and fulfillment and how these design features can be embedded in an informal online learning environment.

## **3 METHOD**

Surprisingly, even though website design has been studied for decades, the goal of explicitly designing learning websites for enjoyment, especially to in terms of the three sub-dimensions of engagement, positive affect, and fulfillment, has been relatively unexplored. In fact there is little research in general on design features that lead to enjoyment and very little work that employs qualitative methods to gain insights into end users' views. Our challenge was to design a study that could provide rich data on which an empirical exploration of users' experiences could be conducted. We needed to determine relevant web sections in a non-simulated museum to stimulate responses, select participants for this study, design the research tools and use an appropriate data analysis method.

With the support of the National Palace Museum, Taiwan (NPM) we selected three relevant web sections offering diverse design features to stimulate the participants into various modes of thinking. These sections

were part of the award-winning site “Age of the Great Khan” and presented relevant concepts (developing paintings) from a single topic (Yuan dynasty period). While offering thematic unity, each section was different. The “Balance” section contained interactive multimedia demonstrating how to develop a balanced painting, with the materials presented in 6 steps on one screen. The “Portraiture” section also contained interactive multimedia illustrating new painting techniques, with the materials presented in 27 steps with animated graphs and pop-up windows. Finally, the “Khubilai Khan Hunting” section was a reading-based section presenting the Emperor and his Empresses in a hunting scene. The lesson was read via hyperlinks as in turning pages of a book and clicking on the painting to view an enlarged image. Data was collected by an online questionnaire from voluntary and anonymous participants. The online survey system, developed by the NPM website team, randomly and automatically assigned each participant to a group (see Table 2). Participants in Group 1 visited the “Balance” section first, then moved on to the “Khubilai Khan Hunting” section and then completed the survey questions. Group 2 followed the same process, but visited the “Portraiture” section first. The important feature of the research design is that each participant visited more than one web section.

	FIRST Visiting →	SECOND Visiting →	Data gathered	Survey Completed	Provide opinions for design features	Provide perspectives for design guidelines
Group 1	 “Balance” section	 “Khubilai Khan Hunting” section	Opinions and perspectives for designing enjoyable experiences in the informal online learning.	418	278	198
Group 2	 “Portraiture” section	 “Khubilai Khan Hunting” section	Opinions and perspectives for designing enjoyable experiences in the informal online learning.	533	337	232
Total				951	615	430

Table 2. Research Design

Of the 951 participants who completed the survey, 615 participants answered 4 open-ended questions about characteristics of websites that encourage enjoyment of web experiences and informal online learning and 430 participants answered 4 open-ended questions about guidelines for developing a web site that supports enjoyment of web experiences and informal online learning. The high volume of responses provided a rich source of data for analysis.

To analyze the participants’ narratives, we followed content analysis procedures as illustrated by Rossman and Rallis (2003). Content analysis method is a set of procedures for analyzing text-based materials (Flick 2002). We coded the text and organized into manageable categories that presented relevant and meaningful information. The qualitative data analysis software, ATLAS.ti, was used to assist the data coding process. This tool allows efficient and effective handling of research data and the mapping of the concepts that emerge from the content analysis.

Figure 1 presents a concept map of the relationships among the research notions and key words that resulted from the analyses of all 1045 (= 615 + 430) narrative responses. The key words were selected by considering the research questions. In Figure 1, the central idea is “Enjoyable Learning Experience” and there are eight aspects related to this central idea. Based on this conceptual map, this study generated nine categories by analysing the relationships among key words and the original data repeatedly: (i) new functions and innovative learning materials; (ii) coherence of design concepts and learning resources; (iii) unenforced learning state; (iv) helpful information and extension; (v) applying visual, auditory, and kinaesthetic design features; (iv) increasing involvement and possession; (iiv) designing positive feeling; (iiiv) providing emotional-driven learning surroundings; and (ix) developing connections and interaction between learners. Categories (i) to (iv) shown above answer the research question 1. Categories (v) to (ix) and part of category (v) address the second research question.

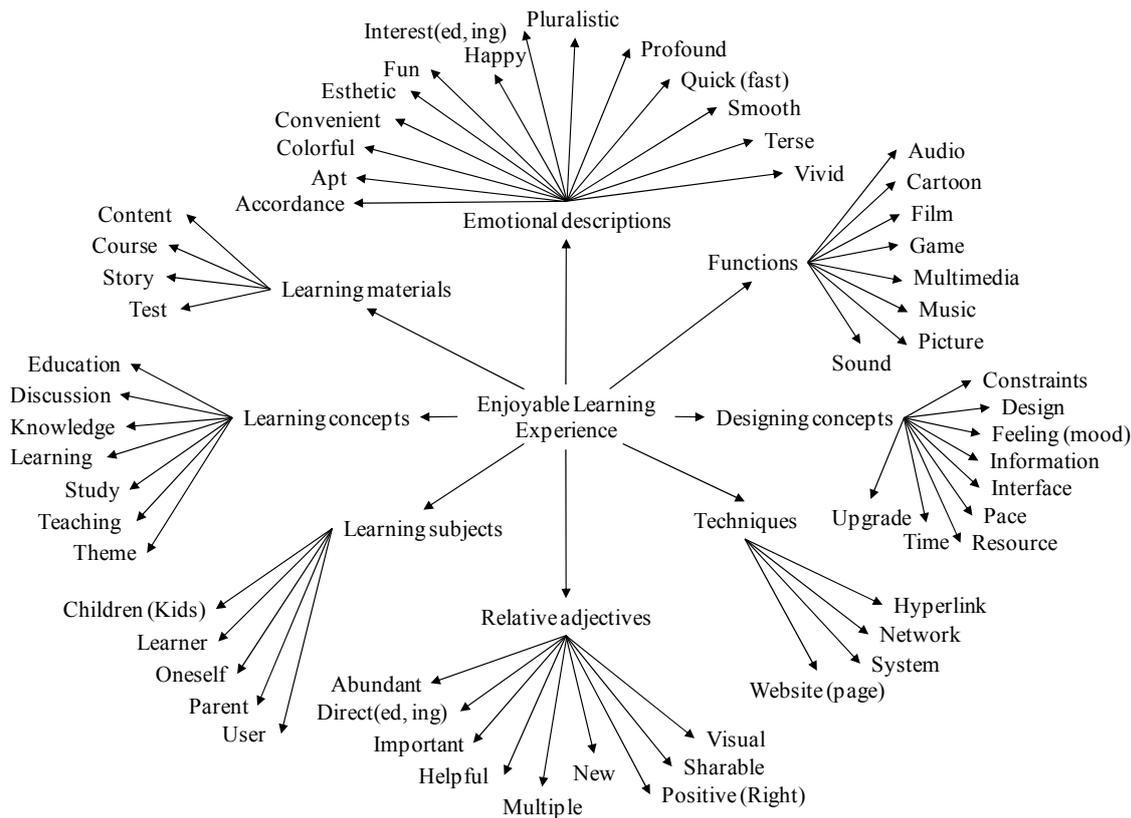


Figure 1. Concept map representing key words relating to enjoyable learning experience

## 4 FINDING AND DISCUSSION

Analysis of the responses to the numeric part of the survey showed that participants agreed the traditional website design features, such as attractive appearance, ease of use and navigation, opportunities to interact, accessibility to people anywhere at any time, short and simple learning tasks, free access, and provision of appropriate feedback (e.g. correct answers for learning questions), are all important. This study, however, focuses on the open-ended responses that were analyzed during the qualitative phase of the overall study. Consequently, this section present a discussion on the main findings of our study in relation to the questions earlier enunciated. We focus first on the characteristics required of systems that provide for enjoyable online learning and second on design guidelines for these websites.

### 4.1 Characteristics that Encourage Enjoyable Informal Learning

Our study revealed four new design features, especially for designing online learning with enjoyment experience: novelty, harmonization, no time constraint, and proper facilitation and associations.

**(1) Novelty:** Creating enjoyable learning experiences requires an effort in the provision of novel elements that can be a memorable and motivational factor with potential for long-term impact. Most of the participants expressed a desire for enjoyable online learning websites that could draw their attention by providing new content, new functions, and new interfaces frequently. These opinions go beyond traditional requests for attractive appearance, since design feature as attractive appearance only concerns the first time experience when engaging a website. This finding agrees with studies indicating that a novel stimulus is able to engage and draw human attention and, moreover, also to elicit and affect human thinking and decision making (e.g. to decide whether further processing and possibly adaptive action are required or whether to continue or persist with the current activity) (Ellsworth & Scherer 2003; Scherer 2001).

**(2) Harmonization:** Participants stated that the coherence of design functions can promote enjoyable online learning experiences. They regarded a website as a whole, requiring all of the functions and interfaces to be coherent and harmonized. For example, they wanted not only website functions that are easy to use but also harmonized with an appropriate learning content. Failure to have harmonization between these two elements would make them perceive the website as of a lesser value. Also, a “good website” needs to show coherence between valuable learning content, ease of use and a visual design that is appropriate to the learning objective. Failing to provide these elements could negatively affect the participants’ willingness to continue using the website. The finding supports papers that identify harmonization as a crucial design concept (Bell et al. 2007; Powell 2002).

**(3) No time constraint:** Some traditional online lessons set up time constraints for learners. Many participants expressed that learning materials provided by the informal online learning website should not have this function. This design feature reflects the viewpoint that most visitors to an informal online learning website are motivated by intrinsic personal desires rather than extrinsic motivators for learning. They did not want to feel rushed or frustrated when completing a task. While the educational literature advocates forcing learners to spend a fixed amount of time to solve as many tasks as possible (Narciss 2004), participants in this context preferred time-unconstrained online environments.

**(4) Proper facilitations and associations:** External links and some extra information could help online users to learn well and to be in control of their learning experience by being able to extend the enquiry. Some participants considered external links and extra associations as a channel for obtaining more informative materials. Some thought that these extensions offer the ability to increase their breadth of knowledge because they can visit other relevant and useful websites. Similarly, literature shows that each link might represent a door beyond online users’ expectation and lead them to explore more (Jakob 2000; Powell 2002). More discoveries means more rewards for their learning processes because they can feel this online learning website provides sufficient helpful associations. These associations must also be in harmony with the website.

## 4.2 Design Guidelines for Online Learning for Enjoyment

The analysis of the participants’ comments allowed us to list five extra guidelines in addition to the ones reported in the literature, as follows.

**(1) Designing multisensory learning experiences:** Many participants recommend using combined characteristics of visual, auditory, kinaesthetic, and even tactile design for delivering the enjoyable online learning materials. Some of them expected that the online learning materials could be organized to focus on enhancing and preserving the entertainment aspects in the virtual learning environment. The formal education literature also shows the advantages of multisensory learning experiences to encourage learning outcomes (Carbo 1996; Stone 1992). Our study extends this perspective to informal online learning.

**(2) Create a storyline:** A story-based learning process was recommended by a number of the participants. The online end users thought a storyline was ideal because it can create the involvement and ownership. Some of them believed that if the learning materials contain a good storyline, they will visit the learning website frequently. Reflected to this viewpoint, this study thinks that storyline might be suited for establishing partnership between the online users and the organizations because the more users visit the website, the more connections will be established. This idea is congruent with “Online Game Interactivity Theory” (Friedl 2003). A storyline has also been indicated as a progressive means which can counteract some negative learning consequences (Cresswell 1997).

**(3) Mood building:** The narratives revealed that creating a “positive mood” can promote enjoyable learning experiences and, at the same time, increase the online learning outcome. Some participants said that when they have positive mood (that is, positive feelings) they can memorize more things. This finding aligns with prior studies showing that mood can affect a person’s judgment, inferences, and predictions (Mayer et al. 1992; Ochsner & Schacter 2000). Moreover, individuals in a positive mood tend both to store and retrieve more positive information (Levine & Burgess 1997). This finding is congruent with these prior studies.

**(4) Fun in learning:** Most participants regarded the concept of fun in learning as a vital guideline for the design of enjoyable online learning. Participants expected that websites would provide inner value to achieve their specific learning needs, such as knowledge enhancement and resource acquisition. These participants provided examples of how to achieve this aim; e.g., provide a rich sensory experience that uses novelty, surprise, fascination and the freedom to explore. These end users' opinions are consistent with prior educational studies about learning for fun (see Packer 2006) and also reflect the finding in Section 4.1 of this study.

**(5) Establishing social interaction:** The concepts of a forum and Web 2.0 were also suggested as desirable from the participants' perspectives. Some participants believed that the use of virtual forums or communities provide a useful channel for their online learning because they can enhance their knowledge through the learning materials and also learn from communicating with each other. Typical examples are blogs and virtual discussion rooms helping knowledge sharing among participants. This evidence is also supported by prior work: "Individuals are experiencing a greater sense of social presence while managing their identities, forming meaningful and romantic relationships online, extending spheres of influences, and generating a sense of belonging and meaningfulness" (Norman 2008, p.301). Our study regards this finding as consistent with the enjoyment experience because online users will experience positive affect and obtain fulfillment.

### 4.3 Warner (1980) Conceptual Definition of Enjoyment and Our Study: Discussion

This study argues that the enjoyment experience contains several distinct characteristics and must be treated as a complex phenomenon. The concept of enjoyment necessarily involves three sub-dimensions: *Engagement*, *Positive Affect*, and *Fulfillment* (Warner 1980). Interactive characteristics and immediate access to information have been proposed as means of making the web a particularly useful medium for creating knowledge (Norman 2008) and studies also have found that the higher the human goals, the more sustained the website usage (Said 2004). The results of our study are congruent with these theories, albeit in the context of informal online learning. As Lin et al. (2008) applied 12 characteristics to assess the enjoyment experience of engagement, positive affect, and fulfillment. This study connected those findings through reviewing the nine generated categories of data. Those categorized narrative data provide the strong linkages for the current findings and Warner's (1980) work. Table 3 shows how these theoretical constructs are linked to the design characteristics and guidelines that were elicited in this study.

Research Questions	Findings	Dimensions of Enjoyment		
		Engagement	Positive Affect	Fulfillment
RQ1. What characteristics of a website encourage enjoyable online learning?	(1) Novelty	•	•	
	(2) Harmonization	•	•	
	(3) No time constraint	•	•	
	(4) Proper facilitations and associations		•	•
RQ2. What design guidelines lead to websites that support enjoyable online learning experiences?	(1) Designing multisensory learning experiences	•	•	
	(2) Creating a storyline	•	•	
	(3) Mood building		•	
	(4) Fun in learning	•	•	•
	(5) Establishing social interaction		•	•

Table 3. The Connections between Research Findings and the Enjoyment Experience

## 5 CONCLUSION

This study investigated the nature of the enjoyment experience from the perspective of online end users who had diverse experiences with informal online learning. The enjoyment experience with three sub-dimensions, namely *Engagement*, *Positive Affect*, and *Fulfillment*, has practical value for predicting and explaining the online experiences of web usage. The opinions and perspectives of online end users provided insights into the key factors affecting website design, revealing four new features for encouraging enjoyable online learning, specifically when learning is not part of a formal instructional undertaking: *novelty*, *harmonization*, *no time constraint*, and *proper facilitations and*

*associations*. The perspectives provided by the participants were synthesized into five further design guidelines for developing websites for enjoyable online learning: *designing multisensory learning experiences, creating a storyline, mood building, fun in learning, and establishing social interaction*.

Very few studies investigate website application design with a focus on the enjoyment experience. The qualitative results of this study could potentially be useful in other contexts, such as e-marketing or e-government. The findings of this study can also offer practical guidance to museums, the government, and even the not-for-profit sphere. Website designers and website managers need to look beyond the functions of usefulness and ease-of-use (Allchin & Kano 2005), and also contemplate how to design for user engagement and fulfillment. Appropriate engaging, affective, and fulfilling website features and content can assist these organizations disseminate knowledge and achieve their informal educational missions.

As with any study, a number of limitations should be acknowledged when interpreting the results that we presented. First, all three web sections dealt with Chinese fine art, painting, and calligraphy, a topic which may not have been interesting to some participants, even if their participation was voluntary. In addition, most of the participants were subscribers to the NPM e-newsletter and may not necessarily be representative of the general public. Finally, this study took only the website end-users' view; the designers' view was not considered and compared. This approach is perhaps not a limitation but an issue of scope that needs to be addressed in future research. We wanted to focus first on the users' needs and their perceptions of enjoyment while learning for the sake of learning.

While this study has contributed to bridging a gap in website design knowledge, more studies of this nature are required, not only as a necessary contribution to knowledge but also because they have practical outcomes, relevant to the community, to museums and to the website development industry.

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