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## Understanding and Assessing the Extent of Enjoyment of Web Experiences

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### Abstract

*The aim of this study was to investigate the nature of enjoyment as experienced by users of the web and to provide an instrument for the measurement of this construct. A review of literature across disciplines indicated that enjoyment was characterised by: (i) engagement in an activity; (ii) a resultant positive affect (e.g., pleasure, happiness, contentment, satisfaction); and (iii) the fulfillment of some need or desire. An instrument was developed using Churchill's method and validated. Constructs and measurement scales developed in this study have practical value for predicting and explaining the enjoyment experiences of web users.*

### Keywords

Enjoyment, Website Design, Usability, Engagement, Positive Affect, Fulfillment

### INTRODUCTION

Experiential outcomes of computer use have been much studied, with researchers investigating a number of primarily task-related phenomena such as perceived ease-of-use, perceived usefulness and user acceptance of computer systems (see notably Davis 1989). More recently, however, there has been contention that users' *hedonic* experiences should also be considered (Stelmaszewska et al. 2004, Van der Heijden 2004, Venkatesh and Brown 2001), including the state of *flow* (Csikszentmihalyi 1990, Chen et al. 1999, Novak et al. 2000, Pace 2004), and *funology* (Carroll 2004, Draper 2000, Monk et al. 2002, Shneiderman 2004). Blythe and Wright (2003) argued that in human computer interaction "*traditional usability approaches are too limited and must be extended to encompass enjoyment*". This paper takes up this theme with the aim of investigating the nature of enjoyment as experienced by users of the web. The aim is also to provide a means by which the extent of this enjoyment can be assessed.

The study of web users' hedonic experiences is not just a matter of "fun" but has practical consequences. There are many situations in which the developers of computer systems are interested in whether users of computer systems actually enjoy their interaction with a system. The example that most readily springs to minds is of computer games, but the problem is also relevant in fields including marketing and education. If consumers enjoy visiting web pages then online marketing is likely to be more effective. If online learning is made enjoyable then learners probably learn more and learn more easily. The question of whether enjoyment is implicated in online learning provided the original motivation for the current study, as the authors are engaged in a larger study relating to learning from museum websites. Visitors to these websites have intrinsic rather than extrinsic motives for learning. In this context, making a learning experience enjoyable is additionally important. Better understanding for predicting and explaining enjoyable experience of website usage would have great practical value, both for the website designers who would like to assess users' demand for new design ideas and for website managers who would like to evaluate the efficacy of the website development.

When we came to the question of assessing the degree to which enjoyment arises from a web encounter, however, we found remarkably little to guide us. Even though philosophers and psychologists have contemplated how and why people enjoy, or experience happiness and pleasure for many years, the definition of enjoyment in relation to computer usage is fuzzy and is not differentiated from other related concepts such as happiness, pleasure, fun, playfulness, and flow. No instrument for assessing enjoyment of web experiences could be found.

This paper shows how our review of literature across a broad range of fields led us to posit that the concept of enjoyment involves sub-dimensions that we labelled *engagement* (focused attention), *positive affect*, and *fulfillment*. These dimensions are hypothesised to be fundamental indicators of a user's enjoyable experience with a website. An instrument was developed to assess these dimensions of enjoyment and refined in a pretest. We then investigated whether our understanding of enjoyment as a construct had validity, by using the resultant instrument to assess enjoyment where it was expected to be relatively low (an uninteresting, poorly designed website) and where it was expected to be relatively high (an interesting, well designed website).

The following sections show our study's base in literature, the instrument development process, the pretest and test of the instrument and the validity of the developed understanding of the enjoyment construct.

## UNDERSTANDING ENJOYMENT

This section reviews relevant studies of enjoyment in diverse disciplines and discusses characteristic dimensions of the enjoyment experience.

### Enjoyment

Philosophers and psychologists have created a large body of literature relating to enjoyment, but definitions of enjoyment vary. In philosophy, Perry (1967, p.214) argued that enjoyment is a:

*non-evaluative, non-conative pro-attitude toward some actual object for what it is in itself, which object is a present doing, undergoing, or experiencing on the part of the subject or is something which is intimately connected with a present doing, undergoing, or experience on his part. To be enjoying a thing or to be deriving enjoyment from it, is to have such a pro-attitude toward it. To enjoy or to derive enjoyment from a thing in a dispositional sense is to have a tendency to have this attitude toward it.*

White (1964, p.326) believed that "to enjoy something, . . . . ., is to be having one's desires satisfied."

In psychology, Davis (1982, p.249) expressed the view that "A is enjoying E if E is causing A to have a number of occurrent beliefs concerning E, which collectively add significantly to the pleasure (happiness) A is experiencing."

Csikszentmihalyi (1990) is known for the concept of *flow* and sees the flow experience as a subset of enjoyment and also as a certain type of enjoyment. His view was that when people ponder about what makes their lives rewarding, they tend to move beyond pleasant memories and begin to remember other events and other experiences that overlap with pleasurable ones but fall into a category that deserves a separate name: enjoyment. Enjoyable events occur when a person has not only met some prior expectation or satisfied a need or a desire but also gone beyond what he or she has been programmed to do and achieved something unexpected, perhaps something even unimagined before.

Warner (1980, p.518) defined enjoyment in a thorough way as: "To formulate the definition, let  $t'$  be a moment of time slightly prior to  $t$ ; then we can say that:  $x$  (a person) enjoys an experience or activity  $Z$  at  $t$  if and only if there is an array of concepts  $C$  such that

1.  $x$   $Z$ s at  $t'$ ;
2.  $x$ 's  $Z$ ing causes  $x$  at  $t$ :
  - (i) to believe, of his  $Z$ ing, that the concepts in  $C$  apply to it;
  - (ii) to desire, of his  $Z$ ing, under the concepts in  $C$  that it occur;
3.  $x$  desires for its own sake what (2, ii) describes him as desiring."

The central idea behind this definition is that enjoyment consists in a certain harmony between three elements: the activity or experience itself; the concepts which this activity or experience causes you to believe to apply to it; and a certain desire in which these same concepts figure (Warner 1980).

When dissecting the definition above, three vital concepts can be extracted as component factors of the enjoyment construct. First is the factor of *engagement* in an activity. The fundamental assumption in Warner's definition is that enjoyment is related to "an experience or activity", that the person was doing something that engaged his/her cognition and feeling. Furthermore, the thing a person was doing attracted his/her attention. The definition of enjoyment from Cobuild (2003, p.470) also supports this construction: "Enjoyment is the feeling of pleasure and satisfaction that you have when you do or experience something that you like".

Second is the factor of *positive affect*. The words "to believe, of his  $Z$ ing, that the concepts in  $C$  apply to it", and "to desire" the concepts in  $C$ , imply that that the activity done by a person leads to some desirable positive affects, for instance a feeling of pleasure or happiness. The definition of enjoyment from Davis (1982) and Perry's words (1967, p.214), "To enjoy or to derive enjoyment from a thing in a dispositional sense is to have a tendency to have this attitude toward it" support this view as does Seligman and Csikszentmihalyi's (2000, p.12): "Enjoyment refers to the good feelings people experience when they break through the limits of homeostasis".

The third factor is "fulfillment": " $x$  desires for its own sake" what happens from his " $Z$ ing", that is, it fulfils some need. Csikszentmihalyi (1990, p.46), states that "Enjoyable events occur when a person has not only met some prior expectation or satisfied a need or a desire but also gone beyond what he or she has been programmed to do and achieved something unexpected, perhaps something even unimagined before." In addition, White (1964, p.326) mentioned that "To enjoy something, . . . . ., is to be having one's desires satisfied." All these definitions provide a basis for the ideas that enjoyment means the meeting and fulfillment of a person's needs.

In addition to determining these three fundamental characteristics of enjoyment, it behoves us to consider what enjoyment is not.

### **Flow**

A related but more restricted concept to enjoyment is “flow”, defined as a state of consciousness that is sometimes experienced by people who are deeply involved in an enjoyable activity (Csikszentmihalyi 1990). According to Csikszentmihalyi (1990), people in flow are so involved in an activity that nothing else seems to matter and the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it.

The notion of flow was initially applied to the experiences of web users by Hoffman and Novak (1996) in an assessment of Internet marketing activities. Pace (2004) presented a grounded theory of the flow experiences of web users engaged in information-seeking activities. Pace found that curiosity and interest play a vital role in the flow experiences of web users. Moreover, he showed that appealing content and links also sustain and attract a web user’s concentration. Congruence with personal interests and novelty were two further important factors in bringing about flow. The characteristics of a website such as credibility, correctness, currency, ease of understanding, rarity, emotional impact and aesthetic appeal are also influential in maintaining a user’s concentration so that flow occurs.

### **Pleasure, Happiness, Playfulness, and Enjoyment**

It is also useful to differentiate enjoyment from pleasure and happiness, as while related, they are different concepts. Telfer (1980, pp.12-14) distinguished enjoyment from pleasure by:

1. The scope of their objects: “One can be said to be pleased by almost any kind of thing: the result of the general election, one’s own success in keeping one’s temper in trying circumstances. On the other hand, one can be said to enjoy only one’s own activities or experiences: playing tennis, studying philosophy, or sunbathing.”
2. The reasons for the feeling: “One can be pleased with something not because of anything in its own nature but because it fits in with some goal or wish fairly remotely connected with it, whereas reasons for enjoyment can only be in terms of further specification of the enjoyed thing itself.”
3. Previous wants: “A third difference is that one is pleased when one achieves what one wanted, what will be conducive to what one wanted, what is a part of what one wanted, and so on; whereas enjoyment is not dependent on previous wants at all.” As Csikszentmihalyi (1990) points out, enjoyment may occur even in circumstances one had not even imagined previously.

Perry (1967, p.68) expressed the idea that “happiness indicates success, good fortune, good luck, or prosperity” or in another use, “happiness denotes either the aptness of a thing (typically a word, phrase, sentence) or the ability (typically linguistic) to offer or select what is apt, fit, felicitous, or suitable”, with both meanings being different from our understandings of enjoyment. Yet sometimes concepts are interpreted differently. In Veenhoven’s study (1984), one of the synonyms of happiness is “enjoyment of life” in a hedonic level of affect.

The study in educational psychology of the nature of playfulness has clarified relationships with measures such as creativity and exploration and indicated that long-term consequences, such as learning, result from playfulness (Lieberman 1977). Webster and Martocchio (1992) expressed the view that microcomputer playfulness has potentially important practical implications in the information systems domain. They employed a twenty-two item scale to assess playfulness. Nevertheless, the construct is still distinct from enjoyment.

Congruent with Penny (1967, p.61), we consider that “the notion of enjoyment needs to be constrained in a way in which the concepts of pleasure, joy, delight, and happiness are not. Enjoyment can only be said to arise where there is an act one performs or an activity one engages in; where something is done to one; or where one experiences something in the sense of watching, looking at, listening to, tasting, smelling, or feeling it or in the sense of having it (a sensation)”.

### **Web Design and Enjoyment**

It is beyond the scope of this paper to review fully the substantial literature on the design of websites and the overarching theories of human-computer interaction and usability and how they might relate to enjoyment. For examples of works on website design, see Powell (2002), who states that there are five areas that cover the major facets of web design and usability and designers should keep these in mind at all times. These areas are content, visualisation, technology, delivery, and purpose. Jakob (2000) considers that poor information architecture will always lead to poor usability.

We expect that good website design will be a pre-condition for enjoyable experiences to occur. Users experience a website’s usability from the first moment they encounter the website. If they encounter poor usability the chance of further use of the website decreases, with a subsequent effect on enjoyment.

In summary we concluded from our review of an extensive literature that the concept of enjoyment necessarily involves all of the following:

1. *Engagement* in an activity, attention is focused on some activity, with higher levels of attention being associated with higher levels of enjoyment (as in the flow experience).
2. A *positive affect* arising, that could be designated by feelings of pleasure, happiness, contentment or similar emotions.
3. The *fulfillment* of some need or desire, although this need may not have been previously realised consciously.

Further, with relation to web design, we argue that enjoyment is more likely to arise from a well-designed website than from a poorly-designed site. This argument provides a basis for testing our conceptualisation of the enjoyment construct.

In the following sections we show how we constructed an instrument that instantiates the above conceptualisation of enjoyment, allowing us to test its validity.

## INSTRUMENT DEVELOPMENT AND PRETEST

This section explains and justifies both the questionnaire scale development and the pretest and scale refinement processes. Specific aspects of the research method that are discussed include data collection procedures and data analysis procedures.

### Scale Development

Churchill (1979) proposed a systematic configuration for measure development, extending the argument of measurement theory with notable reference to Nunnally's (1978) study. The configuration comprises a step-by-step procedure whereby a construct is built up from fundamental domain items and assessed in terms of reliability and validity. A number of authors have adopted this configuration in the information systems sphere, including Gefen et al. (2003), Shchiclik and Barnes (2004), and Wulf et al. (2006). Churchill's method has been followed here.

An initial pool of items for the enjoyment scales were developed from the definitions derived above and by reference to some pre-existing scales. Thirty-nine published articles dealing with enjoyment, pleasure, happiness, flow experience, funology, and hedonic experience were reviewed. None of these articles, however, provided a full scale for enjoyment in the sense that the construct has been described above. However, some studies provided items for sub-scales. The original pool of items for the engagement sub-scale were adapted from Novak et al (2000) and Ghani and Deshpande (1994), which used Likert scales. The pool for the positive affect sub-scale were selected from Novak et al (2000), as originally presented by Mehrabian and Russell (1974), who used semantic differential scales. No prior scale for the fulfillment construct in measuring enjoyment could be found. The item pool for this dimension was generated from the definitions found in the literature. All items were then reviewed by an expert review panel comprised of the authors and four academic colleagues. Table 1 shows the original variables used in the enjoyment questionnaire.

**Table 1.** Original Variables Used in the Pretest Questionnaire

Construct	Variable Name	Variable Description
<b>Engagement (Focused Attention)</b> [Nine-point Likert scales (scale values from strongly agree to strongly disagree)]	Enga1	(While visiting the web pages,) <i>I was deeply engrossed</i>
	Enga2	<i>I was absorbed intently</i>
	Enga3	<i>My attention was focused</i>
	Enga4	<i>I concentrated fully</i>
<b>Positive Affect</b> [Nine-point semantic differential scales. (R) indicates the item was reverse-scaled.]	Aff1	(While visiting the web pages, I felt:) <i>Happy/Unhappy (R)</i>
	Aff2	<i>Pleased/Annoyed</i>
	Aff3	<i>Satisfied/Unsatisfied (R)</i>
	Aff4	<i>Contented/Melancholic</i>
	Aff5	<i>Hopeful/Despairing</i>
	Aff6	<i>Relaxed/Bored</i>
<b>Fulfillment (Need or Desire)</b> [Nine-point Likert scales (scale values from strongly agree to strongly disagree)]	Nee1	(After visited the web pages,) <i>It meant a lot to me</i>
	Nee2	<i>It was rewarding</i>
	Nee3	<i>It was useful</i>
	Nee4	<i>It was worthwhile</i>

### Target Websites

Two target websites were chosen as stimuli for a pretest of the instrument and also to be used in a later stage for validation with different participants. One website was selected as being of "more enjoyable" website and one as "less enjoyable". The sites were differentiated on the basis of external judgements. The more enjoyable site (see Figure 1a and 1b) was selected after reviewing a list of sites recognised as leading museum websites. Since 1997, the best museum websites are recognised annually at the conference "Museum and the Web", with categories including On-line Exhibition, E-Services, Innovative or Experimental Application, Museum Professional's Site, Research Site, Educational Use, and Best Overall Museum Site, selected by the judges from all of the sites

nominated. This study began by reviewing the finalists in each category in 2004. The Conservation Centre of the Smithsonian National Zoo (<http://nationalzoo.si.edu/Education/ConservationCentral>) was selected for this research by following the principles of: (1) target for a general audience; (2) contains content of broad appeal; (3) suitable for individual use; and (4) uses multimedia and interactivity. The web pages selected as the stimulus material allow the user to design a “panda habitat”. The site is interactive and cartoon-type and the user can drag various objects into the panda habitat with informative spoken messages giving feedback. As a “reward” at the end of the interaction, if the habitat has been designed successfully, the pandas come out of their cave and begin eating bamboo or bathe in the pool that has been created. This site has features that are associated with enjoyment – it is interesting, pleasing, and provides a recognisable reward.



Figure 1a. The Conservation Centre



Figure 1b. Design a Panda Habitat

The less enjoyable site (See Figure 2a and 2b) was selected from the lists of the “World’s Worst Website Links” at (<http://angelfire.com/super/badwebs/links.htm>). The site selected was that of a religious organisation and is at dokimos.org. The site has music and some graphics but no interactivity. Neither the music nor the graphics had general appeal, judging by the qualitative comments from participants in an initial screening session. It has features that are associated with an unenjoyable experience – it is not pleasing, generally interesting, or directly rewarding.

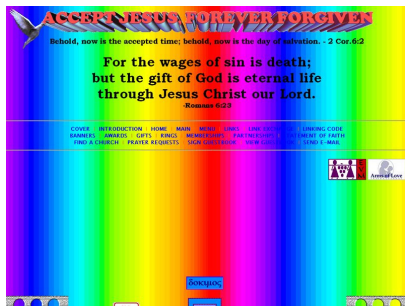


Figure 2a. The dokimos.org



Figure 2b. The Main Page of dokimos.org

## Pretest

Pretest participants consisted of two groups of students studying postgraduate Commerce/Information Systems courses. Students were invited to participate and participation was voluntary and anonymous. Each group was presented the websites in turn for 5 minutes as a demonstrator worked through the website in a pre-defined sequence. The order of presentation of the sites was reversed between groups to avoid order effects. After watching the site demonstration, the participants were asked to complete the enjoyment questionnaire instrument as well as providing some basic demographic information. The students were told that the instrument was being pre-tested and were invited to add any thoughts they had about its readability or any additional comment they wished to make.

Valid data sets were obtained from 85 respondents, 41 from group 1 and 44 from group 2. Reliability analysis showed that the four-item engagement (focused attention) scale attained Cronbach’s alpha = .929 and .961 in the two groups. The six-item positive affect construct achieved alpha reliability of .954 for group 1 and .969 for group 2, while the construct of fulfillment reached a reliability of .940 for group 1 and .962 for group 2. When observations were pooled for the three dimensions of enjoyment, alpha was .945 for engagement, .962 for positive affect, and .949 for fulfillment.

Considering the correlations matrix of these fourteen items with a total of 85 observations, all of the items’ correlations are significant at the 0.01 level (2-tailed). For research rigour, Kaiser-Meyer-Olkin (KMO) statistic and Bartlett’s test of Sphericity were implemented to test the correlation matrix. KMO focuses on measuring of sampling adequacy and compares magnitude of correlations to magnitude of partial correlations (Norusis 1990).

If the KMO statistic is small, it means correlations between pairs of variables cannot be explained by other variables. It is generally advised to proceed with factor analysis with KMO > .5 (always between 0 and 1). In this analysis, the value of KMO was .928, which is greater than .5. This means the correlations between pairs of variables can be explained by other variables. Moreover, the significance value of Bartlett's test of Sphericity is .000, which means the variables (twelve items) are correlated in the population.

Factor analysis was used as a tool to investigate meaningful constructs within the high-dimensional questionnaire response data. It was employed to test whether the engagement, positive affect, and fulfillment items formed distinct constructs. The factor analysis was carried out using Varimax rotation and factors were defined selecting the highest loading in each row subject (Lattin et al. 2003). In the pretest, both single-factor and three-factor solutions provided reasonable and interpretable solutions. The results of the three-factor solution in Table 2 showed that the majority of the engagement, positive affect, and fulfillment items loaded on distinct factors.

Enjoyment Items	Factor 1 Loading	Factor 2 Loading	Factor 3 Loading
Aff4. Contented/Melancholic	<b>0.813</b>	0.392	0.301
Aff3. Satisfied/Unsatisfied	<b>0.769</b>	0.466	0.353
Aff2. Pleased/Annoyed	<b>0.740</b>	0.417	0.413
Aff1. Happy/Unhappy	<b>0.714</b>	0.223	0.571
Aff5. Hopeful/Despairing	<b>0.707</b>	0.455	0.287
Nee3. It was useful	0.399	<b>0.808</b>	0.285
Nee4. It was worthwhile	0.457	<b>0.784</b>	0.292
Nee1. It meant a lot to me	0.398	<b>0.747</b>	0.370
Nee2. It was rewarding	0.345	<b>0.679</b>	0.558
Enga1. I was deeply engrossed	0.287	0.194	<b>0.836</b>
Enga2. I was absorbed intently	0.373	0.469	<b>0.761</b>
Enga3. My attention was focused	0.338	0.534	<b>0.669</b>
Enga4. I concentrated fully	0.336	0.587	<b>0.668</b>
Aff6. Relaxed/Bored	0.497	0.347	<b>0.651</b>

Note: Factor 1 is Positive Affect, Factor 2 is Fulfillment, Factor 3 is Engagement (Focused Attention)

**Table 2.** Pretest Factor Loadings (n = 85)

### Scale Refinement

An aim in constructing the instrument was to keep scales as brief as possible (Davis 1989). When reviewing the correlation matrix of the 14 items included, the correlation values of "Aff5. Hopeful/Despairing" and "Aff6. Relaxed/Bored" are comparatively low. Moreover, several participants commented that "Relaxed" and "Bored" are not antonyms. For these reasons, the items of "Aff5. Hopeful/Despairing" and "Aff6. Relaxed/Bored" were dropped from the positive affect scale. The positive affect construct was also transformed into Likert scales. The nine-point Likert scales were modified to seven-point because most of the participants considered that nine-point scales were too complex. Several verbal ambiguities were resolved by taking into account the participants' comments and suggestions. Table 3 summarises the refined scales used in the following main study. The full four-item engagement, positive affect, and fulfillment scales are shown in Appendix A.

**Table 3.** Refined Variables Used in the Main Study Questionnaire

Construct	Variable Name	Variable Description	Variable Description
<b>Engagement (Focused Attention)</b> [Seven-point Likert scales (scale values from strongly agree to strongly disagree)]	Enga1	(While visiting the web pages,)	<i>I was deeply engaged</i>
	Enga2		<i>I was absorbed intently</i>
	Enga3		<i>My attention was focused</i>
	Enga4		<i>I concentrated fully</i>
<b>Positive Affect</b> [Seven-point Likert scales (scale values from strongly agree to strongly disagree)]	Aff1	(While visiting the web pages, I felt:)	<i>Happy</i>
	Aff2		<i>Pleased</i>
	Aff3		<i>Satisfied</i>
	Aff4		<i>Contented</i>
<b>Fulfillment (Need or Desire)</b> [Seven-point Likert scales (scale values from strongly agree to strongly disagree)]	Nee1	(Visiting the web pages was)	<i>Fulfilling</i>
	Nee2		<i>Rewarding</i>
	Nee3		<i>Useful</i>
	Nee4		<i>Worthwhile</i>

## THE MAIN STUDY

Participants in the main study were students studying undergraduate Commerce/Information Systems. Participation was voluntary and anonymous. Valid data sets were obtained from 112 participants. The stimulus websites and materials were the same as those used in the pretest.

Considering Pearson correlations matrix of the twelve items with a total of 112 observations, all of the items' correlations are still significant at the 0.01 level with 2-tailed test (See Appendix B). In the main study, the value of KMO was .916, which is greater than .5. This indicates the correlations between pairs of variables of the main study can be explained by other variables. Furthermore, the significance value of Bartlett's test of Sphericity is .000, which also means the variables (twelve items) are correlated in the population.

Both single-factor and three-factor solutions were attained in the main study as in the pretest. The single factor result (Table 4) specifies a single higher-order construct corresponding to the expected over-arching enjoyment construct. It accounts for variance of 75.5% of the total variance, a reasonable high quantity for a single-factor result. Furthermore, Cronbach's alpha for the 12-variable grouping was also high, at .970.

The three-factor result, following the hypothesised number of dimensions, was also readily interpretable, as shown in Table 5, with the three factors identified as positive affect, fulfillment, and engagement. The three identified factors aligned very closely with the three constructs identified as representing distinct dimensions of enjoyment a priori. For this result, the proportion of variability captured by the three factors was 89.54%. The four-item engagement (focused attention) scale attained Cronbach's alpha = .941 in this study. The four-item positive affect construct achieved alpha reliability of .963, while the construct of fulfillment reached a reliability of .965.

**Table 4.** Single Factor Component Matrix

Enjoyment Items	Single Factor Loading
Nee1. Fulfilling	.919
Nee2. Rewarding	.917
Aff3. Satisfied	.898
Enga2. I was absorbed intently	.893
Aff1. Happy	.889
Nee4. Worthwhile	.886
Aff2. Pleased	.882
Aff4. Contented	.876
Enga1. I was deeply engaged	.853
Nee3. Useful	.828
Enga4. I concentrated fully	.815
Enga3. My attention was focused	.757

**Table 5.** Three-Factor Rotated Component Matrix

Enjoyment Items	Factor 1 Loading	Factor 2 Loading	Factor 3 Loading
Aff2. Pleased	<b>.821</b>	.321	.363
Aff4. Contented	<b>.817</b>	.367	.308
Aff1. Happy	<b>.791</b>	.384	.343
Aff3. Satisfied	<b>.786</b>	.368	.382
Nee3. Useful	.291	<b>.858</b>	.294
Nee4. Worthwhile	.377	<b>.831</b>	.333
Nee2. Rewarding	.515	<b>.742</b>	.329
Nee1. Fulfilling	.539	<b>.697</b>	.351
Enga3. My attention was focused	.331	.161	<b>.836</b>
Enga1. I was deeply engaged	.399	.286	<b>.807</b>
Enga4. I concentrated fully	.214	.441	<b>.781</b>
Enga2. I was absorbed intently	.380	.429	<b>.753</b>

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalisation. Single Factor is Enjoyment, Factor 1 is Positive Affect, Factor 2 is Fulfillment, Factor 3 is Engagement (Focused Attention)

Factor analysis has played a most useful method in detecting meaningful structure prior to a more in-depth analysis, and as known, it is an exploratory statistical tool. In this study, this configuration is described and discussed in the context of its meaning in terms of the new constructs for enjoyment. Thus, as in the pretest, the main study reflected favourably on the convergent, discriminant, and factorial validity of the constructs of engagement, positive affect, and fulfillment.

### Validation of the Enjoyment Instrument

As a final step in validating our interpretation of the enjoyment construct that underlay the design of the questionnaire instrument, the ratings from the two websites were compared. The reasoning is that a site that has won awards for good design and contains both pleasing multimedia and interesting interactive components and feedback should give rise to more enjoyment than one which has been recognised as among the world's worst, is unappealing aesthetically and has no interactive component or feedback (reward).

Independent, two-tailed t-tests were used to compare user's enjoyment experiences when visiting the two selected websites. The t-test is appropriate here since it can be employed to investigate any significant difference between the responses of enjoyment experiences from the two website visits (the panada habitat at Conservation Central and the religious website of dokimos.org).

For the purpose of research rigour, two basic assumptions were made for the t-test: the populations were normally distributed and had equal variance (Levine et al. 2001). According to the Central Limit Theorem, the first assumption was appropriate. "Levene's Test for Equality of Variances" was applied to test the homogeneity of variance assumption in this study. When the significance (Sig.) is more than .05, this indicates that the variances are homogeneous (Norusis 1990). Here, the significance of Engagement is .912, Positive Affect is .479, Fulfillment is .471, and the significance of Overall Enjoyment is .781, which are all greater than .05 (see Table 6). This study, therefore, assumes that the variances are approximately equal.

Table 6 shows the t-statistics for testing and effects of the main study. From each single dimension and the overall enjoyment experience, all of the means for the visits to the website of Conservation Central are higher than for those the visits to the website of dokimos.org. The t-test value of the construct of Engagement is -6.485, while Positive Affect is -6.180 and Fulfillment is -6.932. In addition, the item of Overall Enjoyment scores the t-test value of -7.308. All of the p-values are significant at the .000 level, indicating that there is a considerable difference in the enjoyment experiences between visiting the website of Conservation Central and visiting the website of dokimos.org.

**Table 6.** The Comparison of Enjoyment Experience Scores

	Visiting the website of Conservation Central	Visiting the website of dokimos.org
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Variable Name	Levene's Test for Equality of Variances	Sig. (P-Value)	N	Mean	Std Dev	N	Mean	Std Dev	Two-Tailed T-Statistic	Sig. (P-Value)
Engagement	.012	<b>.912</b>	56	<b>5.6071</b>	1.38240	56	<b>3.9509</b>	1.31980	<b>-6.485</b>	<b>.000</b>
Positive Affect	.504	<b>.479</b>	56	<b>5.4821</b>	1.30197	56	<b>3.8571</b>	1.47545	<b>-6.180</b>	<b>.000</b>
Fulfillment	.522	<b>.471</b>	56	<b>5.1339</b>	1.43572	56	<b>3.1786</b>	1.54752	<b>-6.932</b>	<b>.000</b>
Overall Enjoyment	.078	<b>.781</b>	56	<b>5.4077</b>	1.29184	55	<b>3.6591</b>	1.22771	<b>-7.308</b>	<b>.000</b>

## DISCUSSION AND CONCLUSIONS

The purpose of this study was to investigate the nature of enjoyment as experienced by users of the web. The aim was also to provide a means by which the extent of this enjoyment could be measured. Concept identification and questionnaire instrument development followed Churchill's (1979) method. Explicit definitions were expressed, followed by a theoretical analysis from various perspectives, including the viewpoints of philosophy, psychology, sociology, and information systems, and even the new sphere of funology. The three dimensions of engagement, positive affect, and fulfillment were hypothesised as important determinants of enjoyment.

Based on these theoretical foundations, initial scale items were developed. To enhance content validity, these were pretested in the pilot study, and several items were excluded. The remaining items, 4 for each of the three constructs, exhibited reliability and validity in the main study with 112 valid data sets and visits to two selected websites. These data sets provided support for factorial validity: the pattern of factor loadings confirmed the three constructs, with engagement items loading highly on one factor, positive affect items loading on another factor, and fulfillment items loading highly on the other factor.

One of the most noteworthy findings is that the pretest with 85 valid data sets and the main study with 112 valid data sets both presented single factor results. Considering the single factor in the pretest, it accounted for variance of 77.3% of total variance, while Cronbach's alpha for the 14-variable grouping was high, at .977. In the main study, the single factor specified variance of 75.5% of total variance, and the Cronbach's alpha for the 12-variable grouping also scored highly, at .970. This means that the three constructs have strong relationships with the major concept of this research – "Enjoyment".

The remarkable differences in degree of enjoyment between the two websites visited – more and less enjoyable – indicated that the instrument had content validity.

The limitation of the study should be acknowledged. A student population was used, only two websites were visited, and the visits were "chauffeured", rather than being under a user's control. These limitations will be addressed in further research.

Previous studies have indicated that website usage for enjoyment is important for progressing website designing and, moreover, for information delivery (Blythe et al. 2003), but enjoyment has been relatively little studied and is not well understood. The phenomenon of enjoyment is believed to have unique characteristics that discriminate it from traditional usefulness, ease of use, and user acceptance of websites in important ways (Blythe and Wright 2003). One of the contributions of this research is perhaps best understood in the context of these differences. When website designers and website managers construct a website, they should not only regard the functions of usefulness and ease of use, but also contemplate the broader level of user's engagement, user's positive affect, including pleasure, content, happiness, and satisfaction, and their fulfillment after visiting a website. Not surprisingly, from the pretest and the main study, this paper found that the more consideration is given to designing website for user's engrossment, sensation, and reaction, the more likely they are to focus their attention on the web usage, and the more likely that they will have enjoyable experiences.

The significance of this study is that it has added evidence to the body of knowledge concerning how to investigate user's enjoyment experiences on web usage. Constructs and measurement developed by this study have added practical value for predicting and explaining enjoyment experiences of web usage. For website designers, this configuration can assist in assessing users' demand and for generating new design ideas. For website managers, it can facilitate the evaluation of the effective information offerings and for future website modifications.

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## APPENDIX A

### Final Measurement Scales for Enjoyment – Engagement, Positive Affect, and Fulfillment

**Engagement:** While visiting the web pages,

	Strongly Agree	Agree	Slightly Agree	Neutral or Uncertain	Slightly Disagree	Disagree	Strongly Disagree
(1) I was deeply engaged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(2) I was absorbed intently	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(3) My attention was focused	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(4) I concentrated fully	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Positive Affect:** While visiting the web pages, I felt

	Strongly Agree	Agree	Slightly Agree	Neutral or Uncertain	Slightly Disagree	Disagree	Strongly Disagree
(1) Happy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(2) Pleased	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(3) Satisfied	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(4) Contented	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Fulfillment:** Visiting the web pages was

	Strongly Agree	Agree	Slightly Agree	Neutral or Uncertain	Slightly Disagree	Disagree	Strongly Disagree
(1) Fulfilling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(2) Rewarding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(3) Useful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(4) Worthwhile	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## APPENDIX B

### Pearson Correlation Matrix – The Main Study

	Enga1	Enga2	Enga3	Enga4	Aff1	Aff2	Aff3	Aff4	Nee1	Nee2	Nee3	Nee4
Enga1	1											
Enga2	.905(**)	1										
Enga3	.790(**)	.749(**)	1									
Enga4	.785(**)	.831(**)	.737(**)	1								
Aff1	.722(**)	.718(**)	.609(**)	.596(**)	1							
Aff2	.724(**)	.743(**)	.589(**)	.613(**)	.888(**)	1						
Aff3	.690(**)	.725(**)	.647(**)	.668(**)	.847(**)	.860(**)	1					
Aff4	.647(**)	.681(**)	.610(**)	.616(**)	.835(**)	.864(**)	.911(**)	1				
Nee1	.710(**)	.783(**)	.591(**)	.667(**)	.793(**)	.791(**)	.792(**)	.790(**)	1			
Nee2	.696(**)	.786(**)	.557(**)	.667(**)	.804(**)	.761(**)	.779(**)	.777(**)	.933(**)	1		
Nee3	.583(**)	.657(**)	.533(**)	.670(**)	.666(**)	.623(**)	.668(**)	.671(**)	.811(**)	.834(**)	1	
Nee4	.663(**)	.742(**)	.544(**)	.694(**)	.725(**)	.702(**)	.742(**)	.703(**)	.874(**)	.897(**)	.908(**)	1

\*\* Correlation is significant at the 0.01 level (2-tailed).

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