An exploration of the attraction factors of learning websites

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Abstract: User experience as a key factor in design field influences users' judgment of a website. Kansei Engineering is frequently employed for helping designers understand users' preference and applying it to improved solutions. Therefore, this research focuses on users' emotional response and the first impression of the learning websites. The investigation of a learning website was explored in order to further understand the user's experience and impression. From selected nine web pages, factor analysis was used to discuss the affective issues of webpages. 15 adjective pairs were analyzed using factor analysis to identify three major factors, pleasure (emotion), arousal (visual design), and readability (layout design). The results could be users emotional responses suggestions for designer in the learning websites design program.

Key words: User's Experience, Semantic Differential Method, Factor Analysis.

1. Introduction

Recent studies show that a greater number of people now learn skills, obtain and share information via websites or forums on the Internet. However, the quality of virtual studying environment has been overloaded with excessive information and chaotic visual elements on the webpages now. Scientists observed experience-controlled, nature objects and events to make the concepts and let the observation make sense. As users are presented with different websites on the Internet, they can switch effortlessly to another website. The influences of user interface and webpage design received increasing attention (Norman, 2002). Thus, web users intend to demand the web pages not only for usability but also for emotional sensation. A human being's affective system is judgmental, assigning a person's positive or negative dimension (Norman, 2002). Emotional responses emphasize the subjective nature of the user's experience of the attraction of the website. It is closely linked to individual feeling, cognitions, and motivations. However, in contrast with the ample amount of research focusing on the interface usability (Cockton, 2002), only a few studies focus on the affective aspects of e-learning environment.

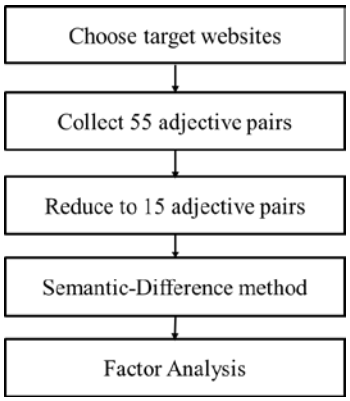
There are two related methods are discussed as below. Firstly, semantic differential method (SD method) (Osgood, 1957) is mostly used to measure method, SD method has been used successfully as the basis for applying Kansei (Sensation) engineering (Jindo etc, 1995). Kansei is a set of methods used for designing the aesthetic aspects of physical products, such as automobiles, office chair design (Jindo etc, 1995). Using SD methods, each affective dimension is defined by a set of pairs of polar adjectives, such as 'beautiful–ugly, warm-cold'.

Secondly, factor analysis is a statistical method used to describe variability among observed, correlated variables in terms of a potentially lower number of unobserved variables called factors. Thus, Factor analysis of the collected data was classified several main factors for reducing excessive variables.

2. Experiment Design

Four steps are executed: 1. select target websites. 2. Collect the original adjective pairs. 3. Utilize semantic-difference method and factor analysis to gain selected adjective pairs. 4. From factor analysis to gain three main factors. The experiment flow of this study is shown as Table 1.

Table 1. The experiment flow of this study.



2.1 Select Websites

Users' perception and preference affect how the web pages of a learning website are selected. In this survey, website subjects were limited to image editing software, such as Adobe Photoshop, and only the main web page was used in each case. Note that this experiment focuses on user impressions and allows the user to absorb the layout of static visual website on a web page, hence acoustic, animated website, and content are ignored. Two experts suggest deleted invalid websites and not frequently visited websites. Therefore, the nine most frequently visited websites were included nine websites, PIXEL2LIFE, heytalk, 68 PS, Spoono, Intelligent Group, Teacher Tiger, Psdtuts+, Unlimited design, Flycan, from 62 primary websites proposed.

2.2 Survey on Semantic Adjectives

The 60 students were asked to write down 10 emotional adjectives which define a good learning website, such as beautiful, comfortable etc. The total number of adjectives collected was 110 (equal 55 adjective pairs) in the preliminary phase. Those all adjectives were analyzed by factor analysis method to reduce to 15 adjective pairs. The 15 opposite adjective pairs are as follows: exciting-unexciting, interesting-boring, creative-traditional, attractive-unattractive, satisfied-unsatisfied, refined-rough, various-uniform, varied- monotonous, arousal-un arousal, professional-amateur, clear-confused, easy to understand-not easy to understand, organized-chaotic, simple-complex, and regular-irregular.

2.3 Experimental Process

There were 60 participants, consisting of 38 female (63.4%) and 22 male (36.6%) undergraduate students (different from the previous two surveys). The participants' ages ranged from 19 to 24, with an average age of

21.14. The distribution of participants' grade are listed: sophomore is 15 (25.0%); junior is 23 (38.3%); senior is 22 (36.7%). The respondents had used online learning systems for an average of one to three years. All participants were required to be familiar with basic computer functions and have never used experimental website before this experiment (Show as Table 2). They participated voluntarily in the study.

In order to clearly investigate user's perceptions, we developed a system for an online survey. Nine web pages were used in the survey. On each page of the survey, one of the nine web pages that were employed in this experiment was shown on the left, and the 15 adjective pairs were shown on the right, with seven-point Likert scales. Perception measurement items for each web page was asked to rate the extent from 3 through -3. (3 = strongly positive degree and -3 = strongly negative degree). All participants were asked to look at each web page from one to nine as they appeared in random order on computer screens. Users could view the web page and at the same time indicate how much they felt the responses described by each of the 15 opposite adjective pairs. The system did not allow the users to go back to the previous pages and change their initial opinions. Each website was randomly assigned to view only a single web page and participants were asked to view each web page for the same amount of time (30 seconds). Those website were not able to click on the links on the web page.

Table 2. Profiles of respondents.

Demographics	Level	dataset
Sample size	university students	60
Gender	male	22 (36.6%)
	female	38 (63.4%)
Age	19~24	21.14
level	sophomore	15 (25.0%)
	junior	23 (38.3%)
	senior	22 (36.7%)
e-Learning experiences	less than one year	6
	one to three years	19
	three to five years	24
	over five years	11

3. Results and Discussion

The dataset collected from the SD survey were processed by factor analysis. This study used factor analysis method to reduce the set of variables in a dataset, and find major influence factors in many adjective pairs. The result, as shown in Table 3, reveals that the 15 opposite adjective pairs were used to measure user's impression of the learning websites. Factor analysis of the collected dataset was performed to separate main factors for adjective pairs.

The factor loadings of the three factors for the variables are plotted against each other. The first factor, which accounts for 48.333% of the variance percentage, includes the adjective pairs: refined-rough, satisfied-unsatisfied, creative-traditional, and varied-monotonous. This factor was named pleasure factor, related to personal intuition, emotional responses and satisfaction. The second factor, which accounts for 28.387 of variance percentage and includes the adjective pairs: exciting-unexciting, arousal-un arousal, various-uniform, interesting-boring, and attractive-unattractive. This factor was named arousal factor, related visual attractive and richness. The third factor, which accounts for 15.430 of variance percentage and includes the adjective pairs: clear-confused, regular-irregular, organized -chaotic, readable-unreadable, and simple-complex. The final factor was named readability

factor, related rate of arranged layout and readability degree. Internal consistency was assessed by the Cronbach's alpha coefficient. The Cronbach's alpha coefficients ranged from 0.937 to 0.969 and all variables' Cronbach α was 0.925 has high reliability coefficients. The results presented in Table 3 attest to the high internal consistency of the instrument in which all values were above the suggested 0.70 level for scale robustness.

Table 3. The Factor Loading Value of 15 Adjective Pairs.

Factors	Adjective Pairs				Cronbach α	
Pleasure	refined-rough	.918	.330	.392	.942	.925
	satisfied-unsatisfied	.904	.388	.377		
	creative-traditional	.854	.254	.540		
	varied- monotonous	.776	-.224	.553		
	professional-amateur	-.718	.448	.338		
Arousal	exciting-unexciting	.056	.989	.255	.969	
	arousal- un arousal	.032	.976	.238		
	various- uniform	-.071	.975	.142		
	interesting-boring	.451	.882	.148		
	attractive-unattractive	.040	.865	.545		
readability	clear-confused	.256	.428	.947	.937	
	regular-irregular	.161	.073	.923		
	organized -chaotic	.186	.467	.870		
	readable-unreadable	.623	.125	.833		
	simple-complex	.697	-.108	.786		
	Eigenvalue	7.250	4.258	2.314		
	Variance Percentage	48.333	28.387	15.430		
	Cumulative Percentage	48.333	76.720	92.150		

Extraction Method: principal component analysis. Rotation Method: orthogonal rotation with Kaiser Normalization's rule. **<0.05 **<0.01

4. Discussion and Conclusion

The aim of this study is to investigate what factors impact users' first impression of learning website. Sharing knowledge and discussion forum is the major feature on web2.0 environment. It lets people search and learn easily. Learning website is a type of support more leaning information, help users solve learning problems and easy to read. Thus, learning websites should give users clear webpage layout and readable teaching case in homepage (Uchida H, 2000). The results of this study indicate users' impression of learning websites was closely related to three factors: pleasure, arousal, and readability. The impression of web page seems closely related to users' initial emotional responses, especially in pleasure and arousal state. The user's first impression determines their interest in visiting the website (Bucy, 2000). User tends to like to choose a website which gives a good impression is easy to read and has a clear webpage layout. In addition, the factor of readability was closely related to the design of

webpage layout. A good readability learning website includes clear text block, proper graphics or icons, bright color tone, structural layout and empty spaces design in order to promote usability.

Drawn from the above discussion, the findings from this study can be summarized as following. Users' impression were closely related three perception factors : pleasure (emotion), arousal (visual design), and readability (layout design). The results provide user experiences and improved suggests for teachers, course managers and website designers.

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