

The Utilisation of Visual Elements on Interface Design of e-learning.

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Abstract. The quality of e-learning in term of presentation of interface design has been discussed among researchers. The focus has been on the quality of graphics and how useable the interface to the user. This paper highlights on the visual elements of interface design which involve the development of navigation button and structure. The elements of text, graphic, shape and colour play important roles to make the interface attractive and useable. Each of the elements can give different impact on interface design development. The understanding about these elements will help designer to produce a good interface design which will also affect the user to use the programme. The application of symbol and icon on navigation button can create aesthetic visual but how useable it is to the user, can they understand the meaning of each symbols if there is no label attached to it? This research will attempt to answer the question. The semiotic theory which involves semantic study is also included for researcher to understand the relation between sign and meaning, the denotation and connotation of symbols. It is essential to know the user perception as e-learning is user-centred.

Keywords: Visual Elements, Interface Design, e-Learning.

INTRODUCTION

Graphical User Interface (GUI) is essential in the development of e-learning application. There are thousands of education applications available in the market. Based on the data published at [18], there are 9.95% education apps of 75 billion applications downloaded from Apple Store. This is to show the demand of learning application, third behind games and business application. As for Malaysia, the government through Ministry of Education (MOE) has put an initiative to provide e-learning content to all students nationwide. The 1BestariNet provide a single learning platform via 4G network which can be accessed by 5 million students [12].

The effectiveness of user interface for e-learning is still being discussed among researchers and developers. According to previous research by [14], a poor user interface design with unattractive visuals is the reason why so many interactive courseware never been used. The Ministry of Education [11] in its report stated that level of courseware

acceptance is still at the average and it was related to interface performance, apart from attitude of teachers and students towards the application. This paper is focusing on the implementation of textual and visual elements on navigation of interface design. Both elements have their own role to play, to make the interface more attractive and user friendly.

E-LEARNING

E-learning is described as all forms of electronically supported learning and teaching, a system for information and communication that serve as specific media to implement learning process [19]. There are presented in the form of courseware, computer based training (CBT), video etc. The great advantage of e-Learning is it can liberate interactions between learners and instructors or teachers from the limitation of time and space [7]. Student can learn from anywhere and anytime. The advent of mobile applications have made e-learning more significant. It has been further developed and be known as m-learning.

E-learning is not only used for learning in school, there are companies implement e-learning to train their employees, especially companies that apply certain system in daily operation. The characteristics of e-Learning fulfill the needs of modern society to learning. There are great demand from businesses and higher education institutes [22]. There are several softwares available in the market to allow employers develop their own e-learning. Software like Camptasia and Captivate can produce e-learning through video. As for courseware, Adobe Flash is still being used in the development of rich interactive learning content.

GRAPHICAL USER INTERFACE DESIGN

Interface design is a vital aspect in e-learning courseware. It allows user to interact with the computer that contains the learning content. Interface is defined as a device or program enabling a user to communicate with a computer [20]. Another definition of interface is a place where interaction occurs between two systems, etc [21]. Interface design performance is significantly related to the effectiveness of learning experience [16]. By having a good design, user will have a good experience with interaction and navigation. The development of interface design requires at least three aspects. There are user interaction with interface, system usability and interaction between user and system. There are seven attributes related to visual produced by International Standard Organisation (ISO) as a guide for developing interface design. The attributes are clarity, discriminability, conciseness, consistency, detectability, legibility, comprehensibility [5].

According to [3], the user interface has essentially two components known as input and output. How a user communicates with his or her needs to the computer is called input. Some common input components are the keyboard, mouse, trackball, finger for touch-sensitive screens, and voice for spoken instructions. Output is how the computer conveys the results of its computations and requirements. Graphical user interface (GUI) become part of the system that allow user to experience good learning through presentation of graphic. Proper user interface design provides a mix of well-

designed input and output mechanism, that satisfy user's needs, capabilities and limitations [4].

VISUAL ELEMENTS

Visual elements are important in development of interface design. Visual is defined as something we look at (such as a picture, chart, or film) that is used to make something more appealing or easier to understand [9]. In e-learning, there are many visual elements involved. These elements can be categorised into text, image, shape and colour. These elements can give impact on the look and feel of design.

Image

Image or graphic on interface consist of icon, symbol and picture. These images carry meaning. Designers need to understand the theory of semantics as it is a study about relation of sign and meaning. They also need to understand the user before producing the image to be applied as navigation button. The right selection of image could make the icon easier to be interpreted and make the interface friendly to the user. The use of graphics can facilitate learning and recall. Pictures are easier to be recognized. Combination of pictures and words is superior to be memorized [8]. Improper use of graphics can make navigation inefficient, that could distract and confuse the user [4].

The use of icon can make the presentation of interface more attractive. According to [4], icon is defined as pictorial image, used to represent objects and actions (Figure 1). Marcus' 1984 study (as cited in [4], p. 652) stated that icon can be categorized into three categories. First is true icon, which the image signifies the real thing, a clock represented by clock icon. Second is index, which the image refers to the cause of the real thing. The meaning is defined by user experience. The third type is symbol, which the image is arbitrary or rather abstract in appearance which requires learning process to understand the meaning. This is related to semiotics theory introduced by Charles Senders Pierce.

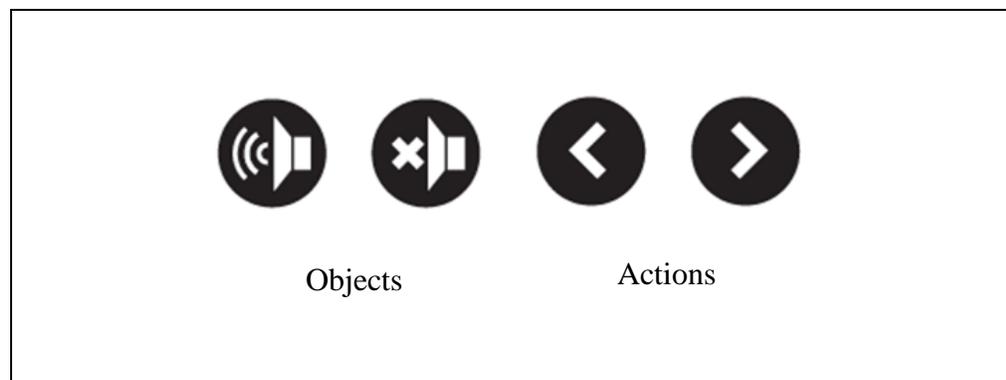


Figure 1: Objects and Actions (Icon)

Shape

Shape is defined as any element that's used to determine or give form [2]. In art and design, shape is divided into two categories, geometric and organic shape. The geometric shape is basically has edges except circle while the organic is free from edges. These two have their own functionality. As for interface, almost all navigation buttons

apply shape. Shape help to distinguish between graphic object and button. The consistency of same shapes give the idea that it is in the same group which eventually help user to interpret it more easily. Shape plays some important roles in icon usability. It has its influence in clarity, consistency and discriminability. Other icon usability is familiarity, directness, efficiency, context, expectancies and complexity of task [4]. According to [17] in smashing magazine website, people in some cultures have learnt that a shape of octagon in red colour give the interpretation of stop. A shape is relatively connected to symbol which also carries meaning.

Colour

Colour plays an important role in graphic design. In e-learning, this is also applicable. To develop a courseware for children, it is important to understand what kind of colour they prefer the most. According to [1], blue is the most popular colour among children. Even though there is a research that most children like blue, it is a kind of restriction for designer to conform to this colour. It will be monotonous to the way visual is presented. Colours can stimulate learning among children as 80% of the brain receives information visually. Color stimulates the visual sense and encourages the retention of information [15]. Colour could make a presentation more attractive. It is vital for developer and designer to come up with good combination of colours for interface design and content.

The importance of colour is also stated in Microsoft's website, known as Microsoft Development Network (MSDN). According to the website, colour is very important in the visual interface. You can use it to identify elements in the interface to which you want to draw the user's attention. Colour also has an associative quality; we often assume there is a relationship between items of the same colour [10].

Text

Text is important as a main medium to convey information in e-learning courseware. It works to elaborate visuals, like a label to an icon. According to [6], text is preferred in a situation where symbol or icon could not represent the message that want to be conveyed. Text is considered part of visual elements as it is also manipulated like images. Text in multimedia is not simply static text, to be read like in a book. Apart from being utilized in writing content, there are being manipulated as links, button and animation. It has its role in navigation, interaction and presentation of the e-learning. However, the over use of text will make the interface less attractive. Some designers categorised text as textual, which is opposite to visual. This is due to the situation where designer need to choose between using text or graphic, to represent a navigation button. Textual means the button represented by word whereas the visual means the button is represented by symbol or icon (Figure 2). However, in their book, [13] had written that designer need to understand the vocabulary associated with analysis of texts, both visual and textual forms of communication.

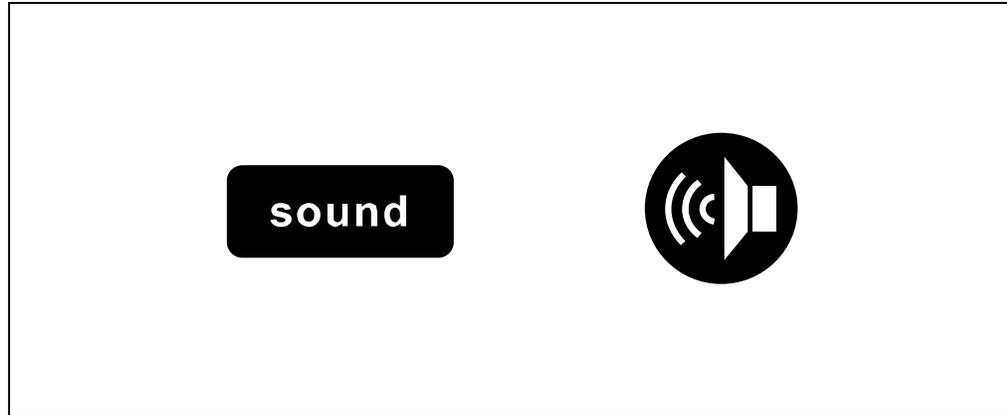


Figure 2: Text and Image (Icon)

SEMIOTIC THEORY

The semiotic theory is introduced by Charles Sanders Peirce (1839-1914). It is a theory about sign relation. There are three category of sign relations namely semantics, syntactic and pragmatics. The theory has been studied by other Linguist like Ferdinand de Saussure (1857-1913), Charles Morris (1901-1979), Thomas A. Sebeok (1920–2001) and many more. [13] described semiotics as a main strategic method to determine their underlying meaning of texts, graphics and images that can be deconstructed and interpreted. [4] relates this theory with icon by saying that icon possess the technical qualities of syntactic which is a physical structure of the icon, shape, colour and dimension. The meaning of the icon is related to semantics and how the icon is produced as pragmatics.

CONCLUSION

Visual elements are important to make interface more attractive and usable. Some experts assume text as part of visuals, some said it is textual. Whatever opinions they have, both are important in the development of interface design, to be a medium of communication and interaction between men and machine. The combination of both is perfect. Icon and symbol which represent visual language are getting more attention these days. Even though people still prefer text to understand the navigation button, we can see that the interface on mobile device like phone and tablet use icon with label attached to it. The icon to represent play, next, previous, sound and home can be easily interpreted by user. If designer can design standard icons or symbols for every task on interface, it will be very interesting. As for now, verbal language still preferred to most of the people.

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