

BUILDING A COMPREHENSIVE VISUAL DESIGN FOR LEARNING MANAGEMENT SYSTEM, MALAYSIA MINISTRY OF EDUCATION LMS AS A CASE STUDY

EswatiAzniJaafar¹, Mohd Syaheezam Asyraq Yamin² and Mohd Faizal Amin³

¹ MIMOS Berhad, MALAYSIA, azni@mimos.my

² MIMOS Berhad, MALAYSIA, asyraq@mimos.my

³ MIMOS Berhad, MALAYSIA, faizal@mimos.my

ABSTRACT

Usability and visual aesthetic elements play very important roles in the evolution of new media design and could be the key factor in determining the success or reliability of a website/portal. The Ministry of Education is no exception benefited the enjoyment of this positive development; it involves teachers, students, and higher administrations. The need to develop a system, which could engage these parties, has been widely initiated. However in the excitement in doing this, one needs to be aware that it has to meet the user's own acceptance. The pillar of this comparative study started with the development of samples on learning management system from Malaysia and international. It has been evaluated under a set of design and usability criteria, and further on, a comparison of findings was done on the major and minor problems. The analysis showed which elements to enhance and could damage perceptions of portal reliability. During the design development process, a new set of design was proposed and tested among local end users by using prototype tools. This study will propose the best approach from design and usability perspective, which enables the systematic development of our education system, and differing from those found in other by adopting our own cultures and mental models. On the limitation aspect, the research will only focus on visual design without looking into the technology behind it, which may affects on its overall performance. The sample of this research was also taken from students aged between 13 to 18 from local secondary school only. Based from the testing, the researcher believed that most Malaysian students are ready for the new approach of Education via information and communications technology (ICT). It is believed that they have been exposed to current technology evolution, and these groups would easily adapt the changes. Implementation of on-line project should be identified from the initial stage, whether it is in the form of application (SAAS) or portal approach because it will drive the whole thing from main strategy or direction and it would eventually be translated into visual design. At the end we would like to have better understanding in creating effective LMS interface and the coherence of design and usability elements applied onto it

Key Words: Visual Communication, Interface design, Usability, E learning.

INTRODUCTION

Learning Management System of Malaysia has been chosen as a case study for this exploratory research, developed by Bahagian Teknologi Pendidikan under MOE. They are adapting from open source platform namely Moodle technology. Being part of designing for new media application, it is known that this field promotes interdisciplinary and multidisciplinary in several connected areas (technical sciences, humanities and design). The challenge for this is, as the www is an extremely dynamic environment where application design options change very fast, it has to be revised and redesign concurrently with current technological wave. From this perspective, researcher knows that both Web visual aesthetics and its usability play very important roles in influential the success of the portal. It is difficult to decide which aspect needs to be given more attention when it comes to designing a portal as aesthetics is focusing on the 'look' and 'feel' while usability is stressing on its functionalities.

PROBLEM STATEMENTS

The 'screen design issues' need to be re-considered in order to enhance the level of understanding and education of student. Clarke (1992:78) describe that 20% to 30% of student tend to read slower for text shown on screen than on paper. Whereby, text with left justified and ragged right edge allows easier reading experience. (Jaya Kumar C. Koran. Sentence needs to be short and precise (eight to ten words). Clarke (1992:79) also suggested appropriate colours could help readers to memorize and recall information given on the screen (JAYA KUMAR C. KORAN).

LITERATURE REVIEWS

Technology overview.

The study of this research is to understand the design gap in the field of technology in education, taking into consideration the usability, user centered design and HCI. As LMS is 'software as a service' (SAAS), it is necessary to comprehend the user need and the objective of the web itself. According to NMC horizon report: 2012 higher education edition, 6 key drivers of educational technology to watch: **(NMC horizon report, 2012)**

Element of user experience

According to Jesse James Garret, a site that really works fulfils the strategic objectives while meeting the needs of our users. Even the best content and the most sophisticated technology won't help you balance those goals without a cohesive, consistent user experience to support it.(Jesse James Garret, 2003). There are certain key considerations in understanding the elements of user experience, which cuts through the complexity of user-centered design from conception completion of any web applications. User Needs and Site Objective – it has to be started with an objective, the goals for the site. Based on its objective, user needs have to be identified through user research.

The 3 Components of Good Web Design Collis'

Collis(Collis, 2008) divided key consideration into 3 components for a good web design criteria. **1. Aesthetic Design** it's all about getting the look right. Different designs convey different messages to an end user, so it's essential that a design match the site's message.**2. Interface Design**; The arrangement and makeup of how a user can interact with a site, a web user interface is where a person and a website touch – so menus, components, forms, and all the other ways you can interact with a website. **3. Information Design** is about preparing the information on a website in the best possible way, so that users can efficiently and effectively find and digest information. In larger sites, just finding information becomes challenging, but in sites both large and small, processing it is always a design problem.

People and culture

People from different countries or cultures navigate user-interfaces (UIs) indifferent ways, prefer different graphical layouts, and have different expectations and patterns in behaviour. Therefore user-interfaces must be adapted to the needs of different locales to provide an optimum user experience Localization, for example of Web sites or software applications, includes changing metaphors, mental models, navigation, interaction, and appearance (Marcus, 2009).

METHODOLOGY

Usability and visual aesthetic elements play very important roles in the evolution of new media design and could be the key factor in determining the success of a website. However, in some or most cases nowadays, the elements of visual have been seen as priority such as colors, shapes, space, and lines. In other words, a good looking' web is also considered as the key attention in developing a successful website. Does 'cool' or attractive look and feel website is enough to capture the objective of user experience? Or should we stress out its functionalities and let the design.

These 2 main research questions has become the key point in this exploring the research.

- I. What are key characteristics, guidelines and approaches in designing interface for Learning Management system
- II. What are Malaysian students user perception and acceptance towards web or portal design?

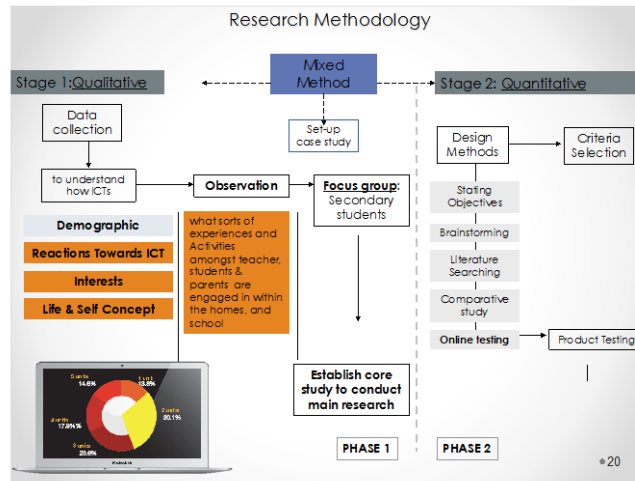


Figure 1 Mixed Method

Mixed method

The approach used is by looking into the quantitative and qualitative elements. On Primary data surveys, the research starts off with a random survey to Malaysia citizens. A questionnaire was prepared with the objective to know and understand the acceptance towards the changes in information and communications technology (ICT) of the local educational system, and also to understand its demographic assessment with the percentage of 46.6% male and 53.1% female has responded Malaysians are fully aware of the importance to upgrade the current educational system. It covers various groups and professions targeted into the three main categories, which are the teachers, students and parents. The summary of the report shows that we are actually ready to adopt and adapt with the new system. Secondary data for this research are also gathered from facts and data from previous research and journals, comprising of multidisciplinary areas such as computer science, communications, user experience and art & design. However, due to the fact that there are various methods and suggestions used from the past research, the information applied onto this research has been applied in accordance with specific area only. **Visual research Comparative study** is the main pillar of this research. A suitable subject has been identified from specific ranking and education field. Two local and international web applications, which carry the element of LMS, have been identified as the subject for this study. **MOE LMS, MARA IVLS, (local) EDU 2.0, Schoology and Blackboard (International)**

Visual Design analysis from existing design

As established earlier, design should not be treat only to its aesthetic approach but should also be emphasize on how it could well interact with the target users. However, the approach of this research has taken the element of design such as colors, shape, space, line size and space to be its field of study. Design Criteria according to Collis, theory of Graphical User Interface (GUI) consists of interface design, aesthetic design and information design. It has been set into the design matrix and as main criteria to proceed with these comparative studies. In this study, it has been extended to certain criteria fixed by the researcher.

Table 1 Design Matrix

Interface design How the user interact with the site	Aesthetic design Overall look and visual	Information design Amount of content
1. Layout and positioning	1. Screen layout	1. Layout menu and sub menu
2. Ease of navigation	2. Typography	2. Organize text (heading & sub heading)
3. General usability	3. Balance	
4. Organize	4. Emphasis	
5. Rule of third	5. Contrast	
	6. Imagery	
	7. Icon	

All samples were treated fairly by applying the design matrix approach. A parameter is set on a scale of 1 to 10, where 10 are considering the best and meets the criteria.

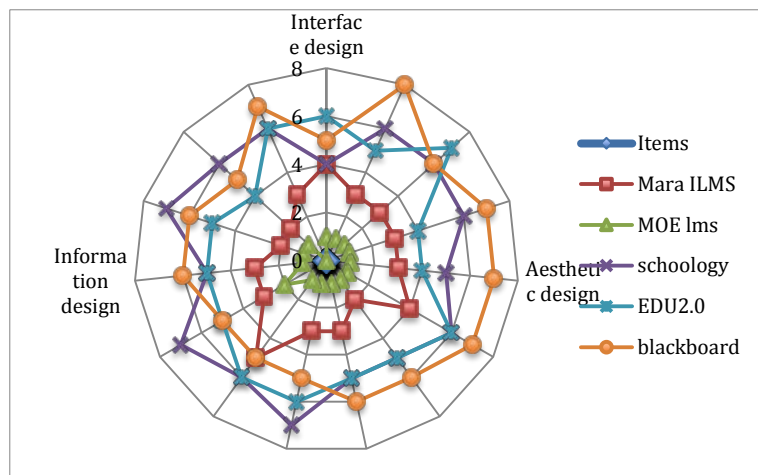


Figure 2 Design matrix analysis in visual comparative study

Usability analysis

Bearing in mind that usability elements could never be isolated or taken for granted from any interface design, this research proceeds also by looking into the context of HCI. As suggested by Nielsen in his book "Homepage Usability", in any applications, the amount of space available on a display are crucial in order to provide output. Areas on the screens or 'screen real estate' as he calls it, have to be managed effectively

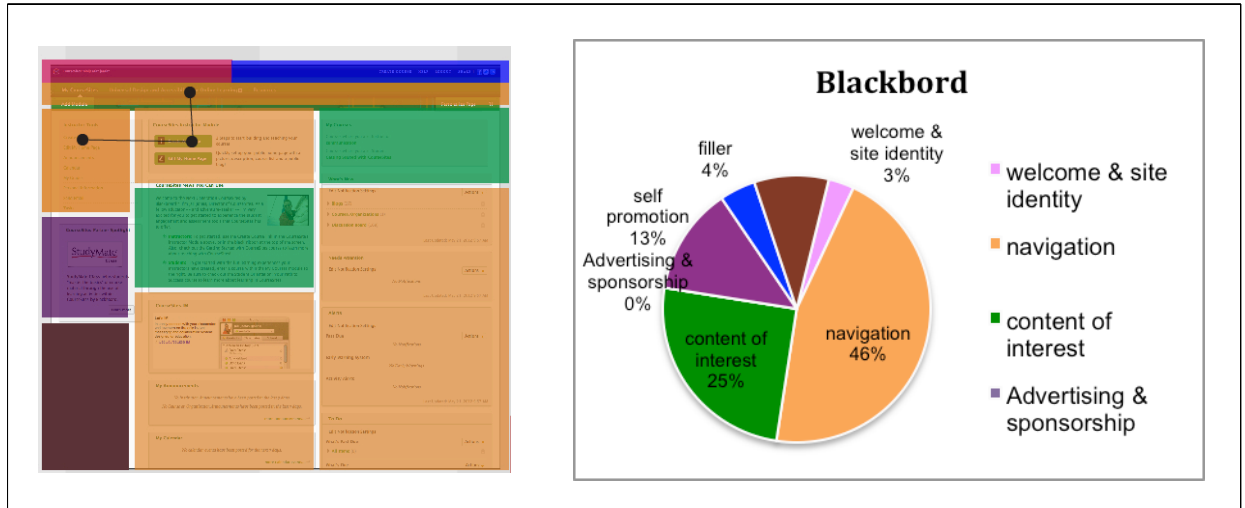


Figure 3 Sample of real estate analysis

Based on the analysis, Blackboard is still the best sample in showing the interface development for a Learning Management System. It manages to fully optimize the interface by separating the screens to 3 columns and locating the most important navigation into appropriate space. To proceed with the development of this project, three prototype designs created based on the analysis. It has to be developed in line with the branding guideline of the Ministry of Education, Malaysia and the content has to be similar with the current content.

Design development

The designs were developed to match with local context and will be tested to its actual target groups. It should covers features and web structure from the current MOE SPSS, and also by adding new features from the current trend and adaptation from the best sample analysis. A sketching processes also a requisite to visualize look and feel of the design. It is also a quick way to create the basic composition of final design illustration. Researcher has fully optimized using this Wire framing tools as visual guide that helps represents skeleton framework of a GUI. It represents page layout or arrangement of the website's content, including interface elements and navigational systems, and how they work together it focuses on "what a screen does, not what it looks like. It is like a blueprint that displays the flow and direction of a design, and how does it connects and related to another. 3 different concepts were developed which are 1 Big icon + typography, 2 Images + small icon + normal typography, 3 small icon + small text

Testing And Evaluation

The testing process was done based on the design matrix, which have been highlighted from the earlier stage of research. Secondary students, aged between 13 to 18 years old have been identified to be the target audience for the test. Online tools, Intuition HQ was chosen as the medium for a testing platform. A set of task has also identified and segmented based on the design criteria.

Table 2 : Sets of task

Design Criteria	Design Elements	Task to evaluate
Interface design	Layout and positioning	Where would you click view your task?
	Ease of navigation	Using the interface below, where would be the main navigation for this design
	General usability	Where would you click to view your email
	Organize - rule of third	Please click on the layout you find more visually appealing
Aesthetic design	Screen layout	Where would you click to login?
	Color	Please click on the layout you find more visually appealing
	Typography	Where would you click to add "things to do"
		Which wording/typography appeals to you?
	Balance	Using the interface below, where would be the main navigation for this design
		Please click on the layout you find more visually appealing
	Emphasis	Where would you click to view your email
		Where would you click to add "things to do"
		Where would you click to monitor your calendar?
	Contrast	Where would you click to view your performance or grade?
Imagery/icon		Where would you click view your task?
		Where would you click to view your email
		Where would you click to view your performance or grade?
Information design	Amount of content	Where to find details about MOE SPSS?
	Layout menu and sub menu	Where would you click to view your email
	Organize text	You are planning a to share new assignment with schoolmate. Where would you go to find these?"
		Where would you click to view your performance or grade?
Consistency	Where would you click to view your email	

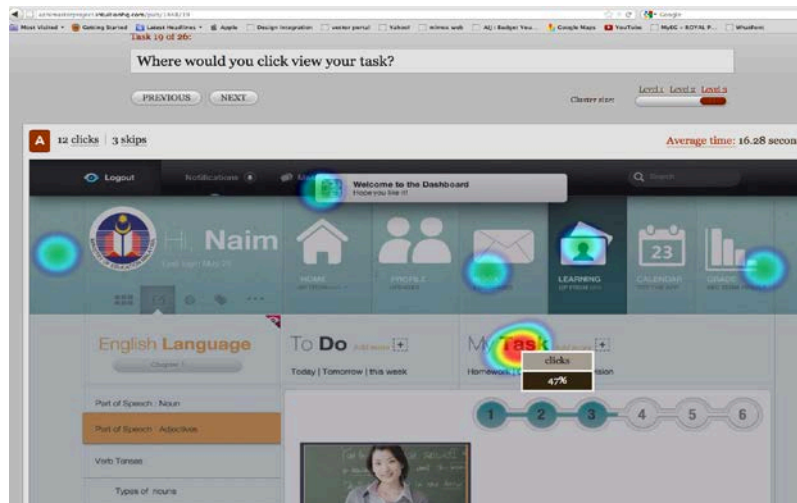


Figure 4 Sample of results Emphasis through Typography style or in context of Information design

Based on the data above, all ratings were totalled up to get the final scores. Obviously, design 1, which is **Concept big icon and Typography**, has been the preferred choice by the participants in term of the 3 criteria as suggested by Collis.

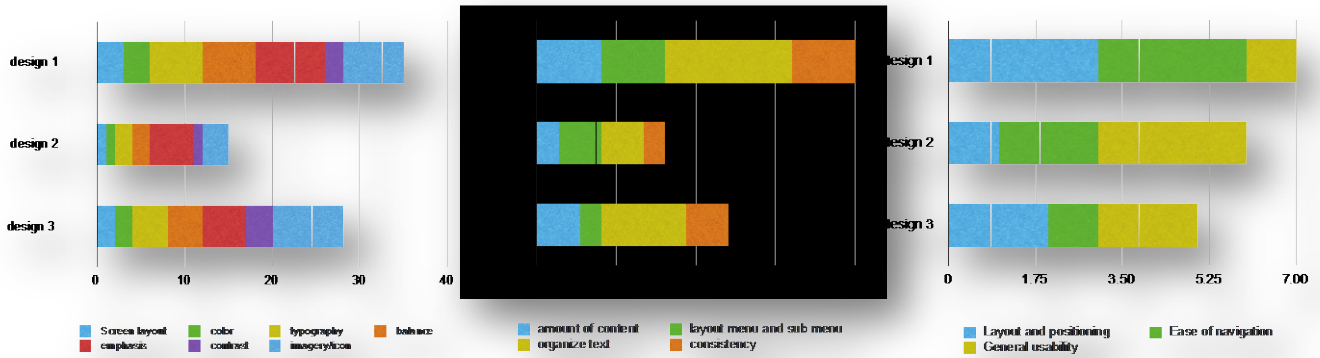


Figure 4.1 Final analysis preferred design

CONCLUSIONS

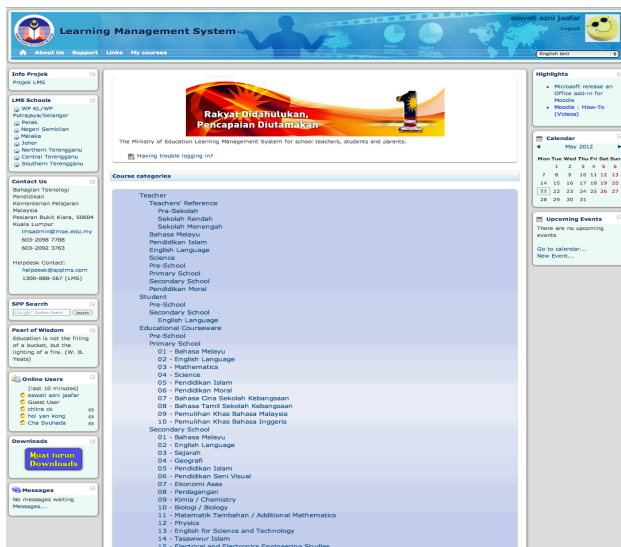


Figure 5.1 Existing Design

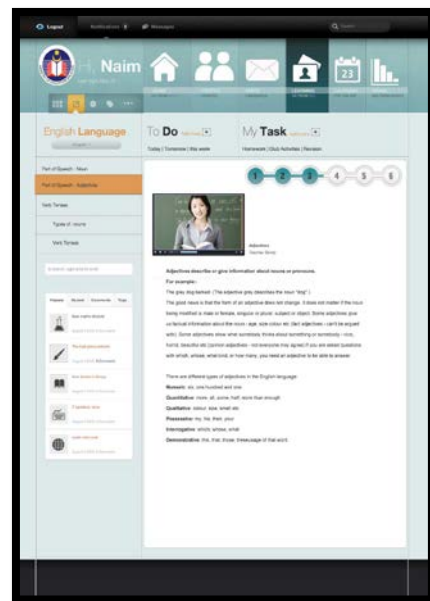


Figure 5.2 Proposed Design

Several elements, which have been emphasized in this study, have shown great impact in the process of identifying a design such as colours, emphasis and contrast. The important information that was conveyed consistently in visuals can facilitate user to easily understand the overall concept of a design and will not be disoriented in the navigation in the website. The current MOE LMS was not properly design and planned, as it should be.

Implementation of on-line project should be identified from the initial stage, whether it is in the form of application (SAAS) or web approach because it will drive the whole thing from main strategy or direction and it would eventually be translated into visual design.

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Collis awesome diagram.source: <http://psd.tutsplus.com/articles/the-3-components-of-good-web-design/> www.12monthstolaunch.com