

2005

End user preference of customisable features within a course management system

Diana Taylor
Edith Cowan University

Follow this and additional works at: https://ro.ecu.edu.au/theses_hons



Part of the [Graphics and Human Computer Interfaces Commons](#)

Recommended Citation

Taylor, D. (2005). *End user preference of customisable features within a course management system*.
https://ro.ecu.edu.au/theses_hons/1116

This Thesis is posted at Research Online.
https://ro.ecu.edu.au/theses_hons/1116

Edith Cowan University

Copyright Warning

You may print or download ONE copy of this document for the purpose of your own research or study.

The University does not authorize you to copy, communicate or otherwise make available electronically to any other person any copyright material contained on this site.

You are reminded of the following:

- Copyright owners are entitled to take legal action against persons who infringe their copyright.
- A reproduction of material that is protected by copyright may be a copyright infringement. Where the reproduction of such material is done without attribution of authorship, with false attribution of authorship or the authorship is treated in a derogatory manner, this may be a breach of the author's moral rights contained in Part IX of the Copyright Act 1968 (Cth).
- Courts have the power to impose a wide range of civil and criminal sanctions for infringement of copyright, infringement of moral rights and other offences under the Copyright Act 1968 (Cth). Higher penalties may apply, and higher damages may be awarded, for offences and infringements involving the conversion of material into digital or electronic form.

**END USER PREFERENCE OF CUSTOMISABLE FEATURES WITHIN A
COURSE MANAGEMENT SYSTEM**

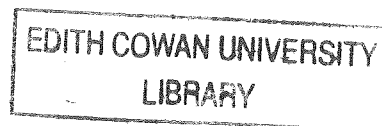
By Diana Taylor (née Przybysz)

**This thesis is presented in partial fulfilment of the requirements for the degree of
Bachelor of Science (Internet Computing) with Honours**

**Faculty of Computing Health and Science
Edith Cowan University**

Supervisor: Dr Justin Brown

2005



USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

ABSTRACT

Customisation is the means by which people alter and change various elements of their environment with the purpose of making it more suited to their immediate needs. This aids in creating a more personalised experience. People are extremely diverse in terms of age, gender, nationality, and with the dominant presence of technology people also have various levels of computer skills and experience. In the context of computer environments, customisation provides the ability to cater for a diverse user group, providing tools and options that assist with specific tasks, improve accessibility and achieve greater user satisfaction. Carter, MacLean, Lovstard & Moran (1990) claim that allowing a user to customise their system to match their personal work practices proves to be a useful technique.

Various educational institutions are employing course management systems (CMS) to streamline and help carry out tasks involved in managing a large course. Students are also required to utilise the CMS in order to carry out various tasks associated with the study demands of their course. There is a variety of literature that discusses the types of customisable features that could be employed in a CMS; however there is no recommendation as to which of these features should be implemented. An analysis of end user preference toward customisable features offered a deeper understanding of the diversity of end user needs and the discovery of specific customisable features that are preferred by the student end user population.

DECLARATION

I certify that this thesis does not, to the best of my knowledge and belief:

- (i) incorporate without acknowledgment any material previously submitted for a degree or diploma in any institution of higher education.
- (ii) contain any material previously published or written by another person except where due reference is made in the text; or
- (iii) contain any defamatory material.

I also grant permission for the Library at Edith Cowan University to make duplicate copies of my thesis as required.

Signature: .....

Date: 24 March 2006.....

ACKNOWLEDGEMENTS

Thank you Justin Brown for taking me under your wing as my supervisor; supporting, guiding and believing in me through this labyrinth they call Honours.

To my family, friends and James my newly wed husband, sincerest thanks for being there for me on this roller coaster journey.

My prayers to complete this paper were answered through the love of those around me and for that I am truly grateful.

TABLE OF CONTENTS

USE OF THESIS	ii
ABSTRACT	iii
DECLARATION	iv
ACKNOWLEDGEMENTS	v
TABLE OF TABLES	1
TABLE OF FIGURES	1
CHAPTER 1 Introduction	2
1.1 Background	2
1.2 Significance of the Study	4
1.3 Purpose of the Study	5
1.4 Limitations of the Study.....	5
1.5 The Research Question Related to the Study	6
1.5 Definition of Terms.....	6
CHAPTER 2 Review of Literature	9
2.1 End Users of Computing Systems.....	9
2.1.1 Diversity and Differences of End Users.....	9
2.2 Features within Course Management Systems	10
2.2.1 Communication tools	12
2.2.2 Productivity tools	14
2.2.3 Course and Resource tools	15
2.2.4 Student Homepage and Interface tools.....	16
2.3 Human-Computer Relationship	19
2.4 Customisation.....	21
2.5 Summary	24
CHAPTER 3 Research Method	25
3.1 Survey Method.....	25
3.1.1 The Survey	25
3.1.2 The Target Population and Survey Sample.....	26
3.2 Survey Structure.....	27
3.2.1 Participant Details	28
3.2.2 Current System Usage.....	29
3.2.3 Interface & Functionality Features.....	30
3.2.4 Customisation Preference.....	32
3.3 Description of Instrument Employed	34
3.3.1 Online Survey.....	34
3.3.2 Amendments as a Result of Pilot Survey	37
3.3.3 Data Validation	37
CHAPTER 4 Data Analysis	39
4.1 Question Set 1: Participant Details	40
4.2 Question Set 2: Current System Usage	41
4.3 Question Set 3: Interface Features	46
4.4 Question Set 4: Functionality Features	50
4.5 Question Set 5: Customisation Preference.....	55
4.6 Summary	58
CHAPTER 5 Discussion	59
5.1 Computer Mediated Communication.....	59
5.1.1 Forums.....	60
5.1.2 Email	60

5.2 Centralised Workload Management.....	61
5.3 Themes and Visual Styles.....	62
5.4 Text links and Icons.....	63
5.5 Variation in Opinions.....	64
5.6 Gender Issues.....	67
5.7 Summary.....	67
CHAPTER 6 Conclusion	69
APPENDIX Data Tables	75

TABLE OF TABLES

Table 4-1: Survey Items	39
Table 4-2: Survey Scale Items	40
Table 4-4: Response to question 2 (%) - Novice/Experienced user breakdown.....	41
Table 4-5: Response to question 2 (%) - Female/Male user breakdown	41
Table 4-6: Overall response to question 3 (%).....	42
Table 4-7: Response to question 4 (%) - Novice/Experienced user breakdown.....	43
Table 4-8: Response to question 4 (%) - Female/Male user breakdown	43
Table 4-9: Response to question 5 (%) - Female/Male user breakdown	45
Table 4-10: Response to question 5 (%) - Novice/Experienced user breakdown.....	45
Table 4-11: Overall response to question 6 (%).....	45
Table 4-12: Overall response to question 7 (%).....	46
Table 4-14: Response to question 12 (%) - Novice/Experienced user breakdown.....	50
Table 4-15: Response to question 12 (%) - Female/Male user breakdown	50
Table 4-17: Response to question 15 (%) - Novice/Experienced user breakdown.....	54
Table 4-18: First or second preference count against the most preferred customisable interface features	55
Table 4-19: First or second preference count against the most preferred customisable functionality features.....	56
Table 4-20: First or second preference count against the less preferred customisable functionality features.....	57
Table 5-1: Participant response before and after the notion of including customisable interface features in eCourse.....	64
Table 5-2 : Participant response before and after the notion of including customisable functionality features in eCourse	66
Table 4-3: The number of participants in various demographic brackets.....	75
Table 4-13: Response to items presented in question 9 (%)	76
Table 4-16: Response to question 13 (%)	77

TABLE OF FIGURES

Figure 4-1: Response toward customisable interface features	47
Figure 4-2: Response toward customisable functionality features	51

CHAPTER 1

Introduction

1.1 Background

Customisation is an ongoing activity that is carried out by people on a day-to-day basis. Our actions may not be immediately acknowledged as acts of customisation; however what we choose to wear, how we adjusted our seat and what radio station we listen to are all custom choices we make to suit our needs. Customisation has progressively become more common in technology with products such as operating systems, office software applications, mobile telephones and countless websites across the Internet including: portals, retail sites, news providers and email domains offering customisable features.

Customisation is the ability to modify, tailor or adjust various elements of an item to better suit ones needs. Customisation offers greater control (Nielsen, 1998; Ravden & Johnson, 1989), accommodates for the needs of diverse population groups (Constantine, 1995) and creates a more personal experience (Fung, 2003; Reppel, 2003). Within an email client customisable features allow a user to manage their mail with the ability to create new folders, set rules to organise incoming mail and indicate the status (read, unread, urgent) of a mail item. Other customisable features such as choice of calendar view (weekly or daily), reply formats and signatures are also offered in various email clients such as Microsoft Outlook. The implementation of these customisable features offers a “massive scale of users an individually personalised experience” (Fung, 2003, p.2).

Stephanidis (1999) claims that customisation of generic applications is becoming more important as it:

- ensures accessibility by all users to community wide information and communication sources
- achieves a satisfactory experience in the use of systems that provide access to a broad range of social activities

Furthermore, Morgan cited in Ferguson, Schmoller, & Smith (2004) claims that there should be a focus on the tasks users need or want to accomplish and customisation or personalisation should be used to balance generic web sites and enhance the user experience, especially for frequent users.

Customisation of a computer system is carried out by the end user when they adjust various settings in order to adapt to the system (Biemans, Schuurman, & Swak, 2003). An end user is one who is not necessarily technically minded but uses a computer to carry out professional or personal tasks, enhance learning or have fun (Benjamin, 1982; Hutchinson & Sawyer, 1996). End user needs vary since people are diverse in terms of gender, age, social background and education (Leventhal, Teasley, & Stone, 1994) as well as the level of experience they have with a computer system (Shneidermun, 1995). Users are extremely diverse, where a system interface may be good for some and bad for others (B. A. Myers, 1994). Constantine (1995) states that customisation is a solution to cater for the diverse needs of end users.

Universities and colleges are environments that typically have large multicultural and academically diverse populations groups. A number of these educational institutions have employed online course management systems (CMS) to streamline various tasks and provide students with tools to assist their studies. Students enrolled at an educational institution are end users of the CMS and must carry out an assortment of tasks on the system as part of their study. Some of the tasks include accessing learning materials, reading forum postings, downloading assignment specifications and even submitting assignments. Without consistent use of the system tools and functions students are at risk of falling behind and out of touch with their study. It is essential that students continuously carry out all the required tasks on the system. Based on the views of Constantine (1995), Fung (2003) and Reppel (2003), the ability to customise a CMS could be beneficial for students by accommodating and supporting their individual study needs.

1.2 Significance of the Study

CMSs or VLEs such as Blackboard and WebCT offer a variety of customisation features for the course facilitator as well as the student. Blackboard allows students to customise the visual appearance of their homepage, calendar, address book, task list and the utility of a search function. WebCT's options allow students to change the colour of their homepage and add personal bookmarks to chosen websites. Furthermore there is an abundance of established web domains including Amazon.com and MSN.com from which to source ideas on customisable features. However there is little available evidence that supports the selection process of these features or notable end user feedback endorsing particular customisable features. This study aimed to determine which customisable features end users would prefer. This in turn would assist the selection of customisable features worthy of consideration for implementation within an online learning environment.

1.3 Purpose of the Study

There is a large array of customisable components to choose from for computer systems and it is important to undergo a selection process in order to include those components that suit the needs of the end user population. Moreno-Munoz et al. (2002) claims that the analysis phase is the most appropriate way of finding what a target audience wants from a web application. A method of alleviating problems surrounding customisation is to “identify in advance the kinds of things users are most likely to want to be able to change...” (Carter et al., 1990, p.178). The purpose of this study was to identify those features that end users want to be able to change.

This study represents a user centred perspective toward customisation within a course management system. It aimed to observe the opinion of end users toward customisation and determine exactly which features are preferred by student end users of a CMS.

1.4 Limitations of the Study

This study is limited to discovering the end user customisation preference within eCourse, a course management system within the School of Computing and IT (CIT) at TPU. Systems are designed to fulfill specific tasks and end users of each system will have differing needs depending on what is to be achieved. Therefore the customisation preferences determined from this study are not directly applicable to other systems. However, there may be several customisation features that have a more universal applicability, such as interface and communication features.

This study did not observe the technical or pedagogical issues that are encompassed with the implementation of a customizable CMS. Issues concerning system performance against usage lies in the field of constantly changing technologies. Pedagogical issues and outcomes were also out of the scope of this research where the course management system is not intended to facilitate learning rather provide users with various tools to carry out desired tasks and to access learning materials online.

1.5 The Research Question Related to the Study

Q1. Which customisable features do end users prefer within a CMS?

From a selection of customisable interface and functionality features, which ones would students like to have as part of their online learning environment?

Q2. What are the opinions held by end users toward system customisation?

How did the notion of including various customisable features impact their opinion towards the system?

1.5 Definition of Terms

1) Tailoring

Tailoring is the adaptation of generic software applications such as word processors, spreadsheets, email systems and drawing editors to specific work practices (Morch, 1997). Carter, MacLean, Lovstard, & Moran (1990) state that tailoring is seen as a process of users evolving a system gradually along with their own changing skills and requirements. Authors in the field use various terms to express the same concept. Terms such as tailoring, customising, personalising are at times used interchangeably yet have significant differences.

2) Customisation

Customisation is driven by the user. It allows users to select preferences which influence the content displayed. Web content is then delivered based on user preferences. Content preferences do not change unless users update their information (Result_Direct, 2003).

3) System adaptation

This is a process of change or adjusting to better conform to environmental conditions of a system

4) User preferences

Similar to customisation user preferences are set of options that allow a user to specify the appearance or behaviours of a system.

5) Online profiling

The building of a profile on consumers' interests by monitoring and analysing the Web pages, types of content, and paths users take while visiting one or more Web sites.

6) Personalising

From recorded online profiles information is dynamically presented in reference to these.

7) Graphical User Interface (GUI)

A GUI is used as a graphical method of controlling how a user interacts with a computer to perform various tasks. Instead of issuing commands at a prompt, the user performs desired tasks by using a mouse to choose options presented on the display screen.

8) Skin/Theme

A skin customises the look the interface to a system or program but does not affect its functionality.

9) Portal

Usually used as a marketing term to describe a web site that is or is intended to be the first place people see when using the web. Typically, a portal site has a catalogue of web sites, a search engine, or both. A portal site also may offer e-mail and other service to entice people to use that site as their main point-of-entry.

10) Web browser

A Web browser is software that allows you to access Web pages on the Internet.

11) Course management system (CMS)

A course management system is used to manage the delivery of online unit materials as well as provide tools for communication and assessment

12) The Particular University (TPU)

The tertiary educational institution in focus for the study

13) School of Computing and IT (CIT)

The Computing IT School at TPU

14) eCourse

eCourse is the current course management system used within CIT

15) Student

A learner who is enrolled in an educational institution

16) Lecturer

A person with special experience or professional qualifications employed to deliver lecture materials on a particular topic to a large group of students

17) Tutor

A person employed to provide teaching assistance or instruction to a group of students on a particular topic

18) Unit

A component of a course covering a particular topic that runs over the duration of a semester.

CHAPTER 2

Review of Literature

2.1 End Users of Computing Systems

Computer systems are generally designed and developed by technically-minded people to provide a service or function to non-technically minded end users. The end user is a consumer of the computer system, using it to carry out various tasks. Benjamin (1982, p.12) states that an end user is “a person without much technical knowledge of computers but who uses computers to perform professional or personal tasks, enhance learning, or have fun. The end user is not necessarily a computer expert and may never need to become one”. A paper by Hutchinson & Sawyer (1996, p.26) reiterates that an end user “is not usually a technically trained computer professional such as programmers or operators. Rather, they are non-technically oriented people who gain some benefit from using computers in their professional work or lives.”

2.1.1 Diversity and Differences of End Users

There are various attributes that describe the diversity of end users. Computer users are diverse in terms of gender, age, social background and economics, nationality and education (Leventhal et al., 1994) and the Human Computer Interaction (HCI) community endeavour to design system interfaces to accommodate each user. Nardi cited in Leventhal et al. (1994), claims that an interface should not be designed based on outmoded notions of demographic difference that discriminate and divide people. “Fragmenting groups by irrelevant demographic characteristics will not help people of different backgrounds work together”(Leventhal et al., 1994, p.2). Users should have the choice to use a different interface to accommodate for physical disability or non-native speaking language, but they should be able to “choose privately, without being marginalized as different from the norm”(Leventhal et al., 1994, p.2). Nardi uses the example that an old person with good eye sight should not be subjected to the ‘senior citizen’s interface’ (Leventhal et al., 1994). Users should be free to customise an interface that meets their real needs and not simply presumed stereotype needs.

End users are also diverse in relation to the computer system itself. Each end user has differing needs based on their knowledge of the system, the tasks they wish to perform and the way in which they want to achieve their outcomes. Shneidermun (1995, p.143) states that “even an individual user can represent a range of changing needs when that user is changing due to learning a new domain, learning to perform a different task, and learning to use different tools and interfaces to those tools”. Users’ needs do not remain constant and a system must be able to accommodate for these unique end user needs, usually by allowing for change and adaptability.

Carneval (1994); Mayer (1981) and Ravden & Johnson (1989) found that novice computer and system users go through stages of learning to develop a cognitive understanding of a new system. From this process a user progressively becomes more adept at using that system and possesses different needs than a novice user. Hence this variation of user expertise should be catered for in the interface design (Carnevale & Carnevale, 1994; Mayer, 1981; Ravden & Johnson, 1989). End users will have differing preferences over the way they wish to use a system including the way they navigate, how the information is presented and how they carry out various tasks. A system can accommodate for these needs by offering a range of suitable features that are flexible and unrestrictive to the way a user chooses to use the system. There is a large variety of features available and it is important to have an understanding of what each feature can offer.

2.2 Features within Course Management Systems

Course management systems (CMS) are primarily Internet-based software applications, used within colleges and universities, that provide tools and services designed to streamline and manage various tasks associated with conducting and administering a large course (Botev et al., 2005). There is a large range of commercial CMSs available that offer a variety of tools and features at varying levels of complexity. The information site “edu-tools” (<http://www.edutools.info/>); a Western Cooperative for Educational Telecommunications (WCET) project, documents and compares the features of many commercially available CMSs to assist in the decision process of selecting a CMS. Besides cost and technical support, it is particularly important for the CMS to have the features that meet the desired needs of the end users and the organisation.

Many universities and libraries around the world opt to develop their own in-house systems to meet their specific needs. These include:

- Edith Cowan University (ECU), Perth Western Australia
- Cornell University (CU), Ithaca New York
- The College of New Jersey (TCNJ)
- The University of Trier (TUT), Germany
- and the Online Computer Library Centre (OCLC), Dublin

Cornell University developed a college wide system that supported workflow associated with running a course with features such as assigning grade responsibilities, tracking regrade requests and group assignments (Botev et al., 2005). The College of New Jersey gathered data from faculty and students, considered to be the two biggest stakeholders in instructional technology, and developed an in-house application customised to the end users' needs (Kapp, 2002). The University of Trier re-developed a simple student registration tool into a powerful system that assists faculty in the management of entire courses (Meinel, Sack, & Schillings, 2002). Online Computer Library Centre also re-designed their website to meet user needs by providing choices in language, file format, navigation method and delivery of new content notification to accommodate audience diversity. In fact some commercial systems started off as collections of in-house scripts and utilities pulled together as simple but very useful web based tools to assist with various aspects of student or course administration (McGrath, 2001).

CMS end user features can be categorised into communication tools, productivity tools and course and resource tools. Each category consists of several individual features that can be implemented differently and to different degrees across a CMS. Furthermore it is rare for a CMS to include all the features (WCET, 2005).

2.2.1 Communication tools

Communication tools are electronic modes of communication that support the exchange of information between distributed groups (Lewis, 2000). These tools enable students and faculty to communicate outside the bounds of the classroom and create opportunities for online distance education programs. The most commonly implemented communication tools within CMS are discussion forums, file exchange, internal email and real-time chat. Other tools, such as video services, whiteboard and online journal/notepads have also been implemented to various CMS but to a lesser extent (WCET, 2005). Kenrick Mocks' (2001) study found that students are favourable toward communication tools and desire involvement, however the use and success of these communication tools is determined by student motivation and participation.

Discussion forums allow students and faculty to participate in a discussion by posting or responding to an initial message creating a sequence of messages known as a thread or threaded discussion. Discussion forums can be school wide, unit specific or can occur privately in small work groups. Faculty are generally able to manage, edit and delete postings and, where applicable, create small work groups. Cornell University's (CU) decentralised approach to CMS allows students to create their own work groups using an invitation-based group creation model to reduce the demand on faculty having to carry out common course related tasks (Botev et al., 2005).

Email within a CMS is generally exclusive to the course or school. Communication takes place between the sender and a specified recipient of the message. Some email tools may include an address book which may be searchable. Edith Cowan University utilises a simple send and receive (only) internal personal messaging tool in place of internal email since a separate multifunctional email system is available for internal and external correspondence. CU uses email as an automatic notification tool when items such as grades and assignment feedback become available. Further more, students have the ability to customise this feature by disabling the notifications if they wish (Botev et al., 2005). The Online Computer Library Centre (OCLC) also offer an email notification service where those who subscribe receive notification of new materials or changes made across the site (Hysell, 1998).

Real-time chat can be in the form of a virtual chat room or instant messaging application. The concept behind chat is that where a message is responded to immediately after it is received. This exchange of messages creates a conversation as

though it was face to face but rather the information is passed electronically. Some chats include other features such as the ability for an instructor to monitor chat sessions and to archive sessions for later reference (WCET, 2005). Lewis' (2000) study of chat tools suggests that students involved in group work that rely on group collaboration could use chat tools to ease effects of distance if meeting in person is not possible.

The online journal/notepad allows student to make personal or private notes which are stored and accessed electronically via a CMS. Personal notes can be shared with an instructor or other students, however private notes cannot be shared (WCET, 2005).

Language is fundamental in communication. The ability to select the language web materials are viewed is a customisable feature offered at OCLC. There are five languages available being Spanish, Portuguese, French, German and Chinese with more languages to be added in the future. Their strategic priority in 1997 was to "internationalise through increased global expansion and perspective" (Hysell, 1998, p.168). The goal was to remove fluency in American English as a requirement for, and impediment to, using their products (Hysell, 1998). OCLC aimed to develop services that reflect and speak to the diversity in languages and perspectives of global users (Hysell, 1998). However, OCLC must be careful not to, as Nardi stated, stereotype users based on differing backgrounds. It was found that cultural groups in Botswana favoured the standard interface of a software application, in English, rather than a localised version in their home language (Norton, 2003).

In the context of eCourse, it could not be expected of TPU, an English based university, to translate learning materials to suit students who have English as a Second Language (ESL). However 'language' could be offered as a customisable feature where students have the ability to set the language in which they wish to view their study portal. The language option would only apply to content that is generally fixed such as the main navigation bar, links, headings or even the news feeds.

2.2.2 Productivity tools

Productivity tools are functional elements that assist system users in organising and carrying out various tasks, resulting in a more productive outcome. Within a CMS, productivity tools are designed to help students in their course of study. Common productivity tools include bookmarks, calendar/progress review, to-do list and the ability to search within course materials.

The search and bookmark tool assist with finding and referencing desired resources. The search tool can overcome the effort of tracking down information by allowing a student to search through course materials to promptly find desired information based on key words. OCLC have advanced their search options, enabling users to specifically define the attributes of what they are looking for. OCLC believe that using metadata to describe the contents of the files on the web will make it easier to ensure effective information retrieval (Hysell, 1998). Bookmarks then assist by storing a reference to resources and pages within a course or externally on the web, facilitating quick and direct access to them. “Systems vary in allowing students to store their bookmarks in a course folder, a personal folder, or a private folder” (WCET, 2005, page: Bookmarks).

Tools such as calendars, appointment books, to-do lists and other scheduling aids help students plan their time, deliver results and meet deadlines just as required in real life (Wolz et al., 1997). Functional calendars or appointment books allow a user to annotate daily scheduled activities and tasks. From a glance it is possible to identify whether one is too busy to take on new tasks and activities amongst previously scheduled ones.

2.2.3 Course and Resource tools

Some of the course tools used by an instructor include the ability to design and develop courses, manage the distribution of unit materials, track students' progress, assess students' knowledge and understanding of unit materials, offer feedback and allocate deserved grades. Under this category students generally have an assignment drop box that enables them to upload their assignments to their instructor and the ability to view feedback and grades. Students at Cornell University (CU) can also view statistics on the overall class performance (Botev et al., 2005).

Instructors are able to design and distribute unit materials according to their desired preferences and pedagogical practices. It is possible to customise the presentation of unit materials by changing the colours, graphics and layout. Instructors can also control the progression of an online class being when the materials, test and result are made available. CU even allow students to access units from previous semester enrolments, if authorised by the department (Botev et al., 2005). In context to commercial CMS it is possible to customise the look and feel of the whole system by branding it with school colours and logos (WCET, 2005).

In the late 90's OCLC provided electronic documents in several formats such as ASCII, HTML, Rich Text Format (RTF) and Encapsulated PostScript (EPS) with Portable Document Format (PDF) to be a new addition (Hysell, 1998). It would be possible for a university to offer learning materials in various formats though this would rely on the effort of lecturers. Text file versions of learning materials would benefit users downloading via low-end equipment or high-end impatience. OCLC found that 30% of users chose text-only over graphical versions (Hysell, 1998). However PDF documents have since brought about a reliable means of electronic document distribution that has superseded many document types.

Rich Site Summary (RSS), also known Really Simple Syndication, is an XML-based communication standard that summarises content of a web site enabling it to be shared with other websites. This technology is often implemented to distribute up-to-date news from sites such as CNN and BBC into smaller domains such as a private homepage. In the context of CMS students could subscribe to desired news feeds to be displayed in their study portals.

2.2.4 Student Homepage and Interface tools

The homepage acts as an entry point to students' course materials, email, course calendar and any public or private announcements. A homepage may also support a student portfolio that allows a student to showcase their work, display their personal photo, and list demographic information (WCET, 2005). The idea that a homepage with the above described features is a study portal is only partly true. 'True portals' would include: user personalisation (unique log-on and the ability to store personal information); and flexible, customisable interfaces (the ability to create views and re-configure the interface) (McGrath, 2001). MyYahoo and MyExcite are commercial examples of true portals. In 2001 both Blackboard and WebCT, two popular commercial CMS, were released with features that represent true portals (McGrath, 2001).

The user interface (UI) requires "an even deeper understanding of the users than the design of the functionality since the interface must match the skills, expectations and needs of the intended users" (B. A. Myers, 1994, p.76). The UI is a means by which users interact with a system to carry out desired tasks. Elements of an interface include menus, content, links, icons, forms, graphics and buttons that require the input of a mouse or keyboard. These interface elements allow a user to communicate with a system and, as previously discussed, end users should be free to customise their interface to suit their personal taste, physical or cultural needs. "Users are extremely diverse, so interfaces good for some may be bad for others" (B. A. Myers, 1994, p.76).

A CMS interface can be made up of icons, text menus or a hybrid of both. An icon is defined as a pictorial representation of an object, an action, a property, or some other concept (vanDam, 1990). Icons are justified as a means to utilise screen space efficiently, only consuming a fraction of space compared to most descriptive words. Raskin (2000) adds that icons contribute to the attractiveness of an interface. Both vanDam (1990) and Raskin (2000) claim that if an icon is well designed, it can be recognized more quickly than words.

Icons can be language independent allowing an interface to be used in different countries (vanDam, 1990) making it easier to translate programs to other languages (Raskin, 2000). The option to use icons seems like an ideal solution for the multicultural environment at TPU. However Raskin's reading of William Horton's *The Icon Book*, 1994, found that an icon that shows the palm of an upraised hand indicates "halt" in the

United States but signifies “here’s excrement in your face” in Greece. It would appear that although icons may be language independent, they are not necessarily culturally independent (Raskin, 2000).

Ideally icons must be easily recognized, easy to remember and distinguishable from other icons (vanDam, 1990). Consider the icon of a brush that commonly represents the paste action but also known to represent the paint action. These icons used in the same program become ambiguous. It is also important not to compromise a clear description of a function by trying to invent a graphical version. A design team queried Raskin (2000) how to draw a busy signal in a sequence of phone status icons and he suggested using words. Words were used and were successful. Icons can enhance the effectiveness of a user’s interaction however they should be used in situations where the design relates directly back to the task and is proved to be advantageous to the user (Raskin, 2000; Ravden & Johnson, 1989).

Icons and text menus accommodate for different needs one perhaps being more suitable than the other in particular situations. Gururajan’s (2002) reading of Shneiderman (1982) found that icons can be enjoyable for all since they are easy to learn for novice user and fast to use by experienced users. However Gururajan’s (2002) reading of Shih & Alessi (1994) found text menus reduce memory load and may be preferred by novice users. It is important to remember that it is not possible to anticipate how a user chooses to use a system (B. A. Myers, 1994).

Screen layout is the arrangement of screen elements; including menus and navigation structures, content and other tool related controls. Waloszek (2002) discusses several aspects of screen layout being:

- “- Flow of control: how users progress through a screen when doing their work
- Dependencies: how elements on a screen affect each other
- Togetherness: which elements on a screen belong together; There may be closer and farther relations between elements.
- Aesthetics and general Gestalt principles: how information can be effectively communicated visually” (Waloszek, 2002, p.1)

Screen elements should be positioned in a sequence of logical progression in order to promote successful completion of tasks. F. Myers (2003) states that novice system users may prefer a linear sequence of tasks where as experienced users may prefer to use more complex and non-linear structures. Screen layout impacts the way information is read and tasks are carried out. A screen layout that is not suited to a user's preferred style of information retrieval can slow down and hinder the completion of a task (F. Myers, 2003). Consideration of: flow of control, dependencies, togetherness and aesthetics will assist in the process of determining where particular screen elements should be positioned and for what reason.

Microsoft introduced desktop themes as part of the Windows95 operating system. Themes were used generally to change colour and sound schemes as well as the look of icons and wallpapers. Skins were later introduced enabling the alteration of GUI elements such as in WinAmp. Themes and skins have become very popular where the attribute of an application being 'skinnable' has become common practise for various software applications. Microsoft's Windows XP allows a user to choose the theme of their desktop to have either the look of 'Windows Classic', 'Windows XP' or a theme available online such as marine life. The application of these themes can change the style of the icons, mouse cursor and sounds. Since the concept of themes has a strong focus on the graphical user interface, it is also referred to as a 'visual style'. Companies which offer users the ability to customise their software have found a distinct advantage over their competitors (Wardell, 2002).

As visual styles became more popular they have since become more technically and commercially advanced. Applications such as IconPackager and CursorXP provide an array of options and styles that assists with the application of themes to specific elements across ones computer system. Since users desire to apply the same visual style to several elements of their computer system developers are now producing suites to cater for a global application of a theme across ones computer system. The strong market demand has made shops such as The Skin Factory and Skin Plant successful businesses in the development of visual style suites (Wardell, 2002).

There is little, if any, concrete scientific or psychological evidence behind the use of colour since people have such a complex psychological make-up. However colours certainly do seem to be fulfilling some psychological desires as do other aesthetic aspects of our environments (MicroAcademy, 1998; Norman, 2002; Sasaki,

1991). Colours play a role in the expression of personality, mood and emotion for every individual and although reasoning may say colour is not important, human emotional reaction says otherwise (MicroAcademy, 1998; Norman, 2002; Sasaki, 1991).

Primarily a good interface should be quick to identify, easy to use with minimal errors and be attractive for the user (Gururajan, 2002). As well as this, a successful interface design should accommodate the individual differences of users (Gururajan, 2002). Furthermore Tang (2001) claims that an effectively designed interface will “generate positive feelings of success, competence and clarity and also create an environment in which tasks are carried out almost effortlessly” (Gururajan, 2002, p38).

2.3 Human-Computer Relationship

Human-computer interaction (HCI) is the study of the interaction between people (users) and computers via the user interface (UI), in order to carry out a desired task (Wikipedia, 2005). Fung’s (2003) study of human computer communication considers the interaction between a user and computer as personal-computer communication (PCC) whereby a sender/receiver relationship is created when a user activates a command and the computer responds accordingly in a graphic, alphanumeric and/or vocal mode. Fung (2003) refers to ideas explored by several researchers stating:

- PCC is a two way process
- users interact *with* a computer as an ‘independent sender/receiver’ rather than *through* the computer
- and users tend to treat computers as independent social entities

This social and dyadic relationship is a personal experience where human emotion and cognitive processes affect how problems are solved and how tasks are performed.

Norman (2002) explores theories surrounding the relationship and the interdependency between emotion and cognition. Our emotive system arouses positive or negative judgements that are interpreted by our cognitive system that formulates an understanding of the environment. The judgments made by the emotive system affect

how well a cognitive task is handled. Negative emotions such as anxiety can be beneficial since the mind becomes focused, however too much can inhibit performance (Norman, 2002). Positive emotions can broaden the mind, but there lies the risk of becoming distracted from the task at hand (Norman, 2002). A study showed that people who are given “small, unexpected gifts, afterwards were able to solve problems that required creative thought performed better than those who where not given gifts”(Norman, 2002, p 40). Positive emotions stimulated positive results. In context to human centred design, pleasure from the appearance or functionality of a tool can positively increase a user’s emotional experience, broaden creativity and increase tolerance overlooking minor difficulties (Norman, 2002). Norman’s overall claim is that attractive and pleasing things work better, are easier to learn, and produce more harmonious results. To clarify this idea, consider the following example: A user who is visually pleased and able to interpret the meaning of an icon design, or perhaps has control over the meaning of the icon, will experience pleasure, confidence and success in carrying out their desired task. Conversely a user who is unable to understand and dislikes an icon design will experience a negative affect of uncertainty, lack of confidence, low tolerance, inefficient outcomes and an overall lack of enjoyment.

The human-computer relationship has the potential to be very productive when interface and functionality design produces positive emotions. The design is crucial in determining whether or not a user will enjoy their experience. It is very difficult to design an interface to suit everyone’s needs especially when a user’s preferred design can depend on “the occasion, the context, and above all, mood” (Norman, 2002, p 37). This is why the ability to personalise or customise the interface design and functionality in the computer environment would better ensure a positive and productive user experience. With customisation a user can change settings to suit their needs no matter what their mood.

2.4 Customisation

Customisation and personalisation fall under the same principle of offering “modifications of the functionality, interface, information content or distinctiveness of an information system with a view to increasing the personal relevance to an individual user” (Treiblmaier, Madlberger, Knotzer, & Pollach, 2004, p 2). According to Nielsen (1998) the distinction between the two concepts lies in the ‘control’ over the system adaptation process. Customisation offers direct user control, where a system offers a range of options where the users adjust the setting according to their need and desires (Nielsen, 1998). Personalisation does not offer user control rather it monitors and collects information about the user and assumes settings based on the gathered information (Nielsen, 1998). Within personalisation lies a risk of disappointing a user’s experience whereas customisation provides the tools in order for the user to control their experience (Reppel, 2003).

Furthermore Treiblmaier et al. (2004) explored the ethical issues around customisation and personalisation and found that there was a higher negative response towards websites that collected information and made adjustments, based on this data, without users’ knowledge or consent. User response toward customisation was more positive therefore customisation was claimed to be ethically less questionable than personalisation (Treiblmaier et al., 2004). “The real way to get individualised interaction between a user and a website is to present the user with a variety of options and let the user choose what is of interest to that individual at that specific time” (Nielsen, 1998, p 1).

Flexibility of the interface means that a user is able to customise various interface settings such as screen layout, information presentation and other basic features such as colour and graphics to their specific requirements. This flexibility gives a user a sense of control over the system by accommodating for each user’s various needs and circumstances (Ravden & Johnson, 1989). Flexible interfaces can “help to increase speed and efficiency of interaction, and to reduce frustration” (Ravden & Johnson, 1989, p 64). For example users with various levels of system experience may desire to bypass certain aspects of the interface in order to make the interaction faster and more efficient (Ravden & Johnson, 1989). Shneiderman (2002) explored multi-layered interface design, a system that enabled users with differing system experience, to have control over which features were available to them at any one time. This

element of control and ability to adapt to various environments and context specific situations enhances a system user's experience. In the context of commercial or corporate websites, flexibility in the interface allows for corporate branding, website integration, increased efficiency and decreased costs (Wolterstorff, Mattson, Tschofen, & Gieneart, 2004).

The amount of flexibility and control a user has over a system is important to consider. Not enough flexibility can be restrictive and be detrimental to speed and efficiency whereas too much can make a system design overly complex and may overwhelm users with all the various options which in turn deters them from their original tasks (Biemans et al., 2003; Ravden & Johnson, 1989). An application with customisable features must establish restrictions or boundaries. Users do not know what is good for them so giving a user loose rein on user preferences may sacrifice usability and purpose (Raskin, 2000). A particular interviewed participant stated, "Too much control may create a new overhead for support staff... Too much control over the user interface may make the interface too difficult for some users" (Ferguson et al., 2004). Overall users should be offered a balanced and verified array of customisable features that will generate a sense of control, meet functional and aesthetic needs, minimise frustration, enhance efficiency and in turn increases the overall user experience.

Biemans et al. (2003) explored how "end users adapted systems to their personal preferences, specific tasks or to broader contexts of use"(Biemans et al., 2003, p1) in particular for mobile telephones and email. The ability to communicate is prevalent in mobile telephones and email yet they possess distinct characteristics and, as Biemans et al (2003) discovered, different user customisation patterns. The study identified that of the 69% of users that customise their email, 24% customised general preferences, 36% customised access to functionality and 56% customised functionality itself. One third of surveyed users were not aware of all the changes that could be made within a system however users claimed they would have customised specific areas once they became aware of them. Furthermore, the more email was used the more it was customised (Biemans et al., 2003). The high popularity toward customisation supports this research paper in the exploration of user preference of customisable system features. The email communication tool is only one of many features within a CMS however the underlying principle toward customisation remains.

Biemans et al (2003) sample population consisted of 56 users categorised as a consultant, student or other. It was concluded that customisation of mobile telephones and email was carried out by almost the entire surveyed population. It was presumed that the high response was due to the ease of customisation and the 'ownership or personal envision' the system offered (Biemans et al., 2003).

An anecdotal study by Ferguson et al (2004) found that users would not create a profile or customise their experience unless the system was already adaptively personalised, based on data held elsewhere. Users are more willing to carry out "second tier customisation", adding or updating details, on a system that is "ready-to-use"(Ferguson et al., 2004). The CMS used in this study is personalised for each student where their name, list of enrol units and any personal message are presented to them when they login.

Rachelle Heller states that the development of tools to customise an interface would be of great value (Leventhal et al., 1994). "First it would improve access for the intended user. Second, the feeling of empowerment achieved by modifying the interface can change the user's attitude toward an application. Third, the modified application interface can give the application designer new insight into how users approach a system"(Leventhal et al., 1994, p2)

2.5 Summary

Each end user of a computer system has a unique make-up of characteristics, including social demographics and system experience, which shape their needs and expectations. In order for a user to achieve successful results, a system must provide the adequate tools, information presentation and usability features that meet an individual's needs and expectations.

There are several categories of tools and features within course management systems (CMS) covering: communication, productivity, course and resources, student homepage and the interface. Various CMS provide a combination of features designed to meet the needs of the school and the systems' end users. It is very difficult to design a system to suit everyone's needs, let alone predict these needs. Research has found that end users will not have a satisfactory experience with a system if they are unable to carry out a task because the tools and features negatively affect their ability to perform. An end user should be able to modify, change, and adjust tools and features within a system in order to customise their work environment that in turn will have a positive effect.

Customisation increases the personal relevance for each end user. Granting an end user control of their work environment, instead of applying a calculated or stereotyped assumption, enables users to target specific areas and adjust them according to their needs at that point in time. However, it is important not to offer too much control as it can hinder performance, therefore a balanced selection of customisable features should be offered. Studies have shown that end users utilise customisable features if they are available them. Due to the prominence of online education and CMS it is important to explore customisation in a learning environment for the benefit of the student, the end user.

CHAPTER 3

Research Method

3.1 Survey Method

3.1.1 The Survey

Quantitative research methodologies, in particular survey methods, will be used as a means to find the answers to the stated research questions. Survey method was the most appropriate research method since it enables a researcher to get a broad sense of public opinion (Braverman & Slater, 1996) and enables the researcher to observe the distribution of traits and attributes among a sample population and the ability to seek interrelationships among them (Babbie, 1973). Babbie (1973) states “Survey methods are used in the study of a segment or portion - a sample - of a population for purposes of making estimated assertions about the nature of the total population from which the sample has been selected” (Babbie, 1973, p.73). Dane (1990) supports the use of survey methods when there is a need to know “what a lot of people are thinking but don’t necessarily need to determine why they are thinking that way” (Dane, 1990, p.121). The research question is shaped to do exactly this, seeking a participant’s preference and opinion toward customisable features, not the reasons behind their preference. Furthermore, Babbie (1973) confirms that the survey method enables a researcher to learn something about the sample selection which enables the researcher to better understand the larger population from which the sample was taken.

Surveys are tools for collecting factual information. Weisberg & Bowen (1997) categorise the type of information that can be obtained by survey as:

- “- opinions on questions of the day
- attitude toward more basic topics
- facts about the people being interviewed” (Weisberg & Bowen, 1997, p.4)

Data collected from surveys is a permanent source of information “It can undergo initial analysis, where it is always possible to return to the set of data and reanalyse from a new theoretical perspective.” (Babbie, 1973, p.49)

3.1.2 The Target Population and Survey Sample

The study targeted students enrolled in the School of Computing and IT (CIT) not the entire University. In 2005 statistics show that CIT is one of five schools made up of over 1,000 students, approximately 450 of which are newly commencing students. CIT students are required to use eCourse, the system on which the research is being conducted, in order to carry out various tasks such as accessing their weekly learning materials, participate in forum discussions and submit assignments.

Sample size decisions, “must be made on a case-by-case basis” giving consideration to the goals of the study (Fowler, 1993). Fowler states that sample size decisions should be developed from an analysis of the “subgroups within the total population” (Fowler, 1993, p.43). The sample size must be able to represent the small subgroups of importance. Within this research, subgroups were based on demographic details and participant’s level of system experience. Since volunteers were sought, it was difficult to determine who and how many people would participate in the survey. Consequently there were 106 attempts to complete the survey; however after data validation, described in section 3.3.3, the total sample population comprised of 85 respondents. Fowler (1993) explores the increase of precision in relation to sample size. It was found that “precision increases rather steadily up to sizes 150 – 200. After that there is much more modest gain to increase sample size.” (Fowler, 1993, p.35). A greater sample population would have increased the precision of the findings being that only 8.5% of the target audience volunteered to participate. It is suggested that a sample should be about 10-30% of the target population (NCWC, 2004)

3.2 Survey Structure

The survey was structured with consideration towards type of questions, question content, response format, question wording and question placement (Trochim, 2002). The survey was broken down and structured into five questions sets being:

- 1) Participant Details: to determine whether attitudes towards customisation were affected by demographic details such as level of study, age or gender.
- 2) Current System Usage: to determine the effect system experience had on responses, in that levels of experience have an effect on user needs (Shneidermun, 1995).
- 3) Interface Features and 4) Functionality Features: to determine which customisable features in terms of interface and functionality aspects, students prefer within a CMS.
- 5) Customisation Preference: to obtain the general opinion held by students towards customisation of a CMS

This method of sectioning offers structure and ensured questions remained in the correct context with the topic under consideration. Each question set was presented on a new page allowing the questions to be attractively spaced out promoting a higher response rate than if many questions were on one page (Fowler, 1993). Transition sentences were used to give the participant an idea of the type of questions that were to follow (Trochim, 2002). To transition into the Current System Usage question set, the text 'Please tells us about you current experience with eCourse', familiarized the participant with the topic in question. Each section contained a series of questions that were designed to retrieve the required information. Question sets and corresponding questions were sequenced according to Trochim's (2002) three rules:

"Is the answer influenced by prior questions?"

Does the question come too early or too late to arouse interest?"

Does the question receive sufficient attention?" (Trochim, 2002, section "Question Placement")

3.2.1 Participant Details

This first question set contained a series of questions designed to gain an understanding of the sample population. Participant's demographic details were identified as independent variables that could affect the results of the study. This series of simple questions were presented at the beginning of the survey with the aim to familiarise and ease participants into the survey environment (Fowler, 1993; Trochim, 2002). The "Participant Details" question set does not interrelate with subsequent question sets however positioning these questions at the end of the survey may not have aroused enough interest to invoke a response. Therefore it was more worthwhile for these questions to appear first in the survey.

Figure 3-1 is a visual representation of the 'Participant Details' question set. Where a question had a limited number of response options; such as when seeking a participant's gender or enrolment type; single-variable (Trochim, 2002) question types were used. These types of questions offered participants a single choice from a number of response options. A text box response format was used for questions that had a broad range of potential responses such as for age and nationality.

Figure 3-1: Survey screen capture - Participant Details

>> PARTICIPANT DETAILS << | CURRENT SYSTEM USAGE DETAILS | INTERFACE FEATURES | FUNCTIONALITY FEATURES | CUSTOMIZATION PREFERENCE & PRACTICES

PARTICIPANT DETAILS

Please fill in the following details about yourself, remember this survey is completely anonymous.

i. Age

ii. Nationality

iii. Gender Male Female

iv. Level of Study 1st 2nd 3rd 4th or Honours GradDip or Masters PhD
Undergraduate Years Postgraduate

v. Course

vi. Mode of Study Internal External Online

vii. Enrolment type Full time Part time

Please check over and confirm your responses before you continue.

Confirm & Continue

3.2.2 Current System Usage

Questions in this set prompted the participant to consider their personal experience with eCourse, as well as introducing them to some of the concepts related to the focus of the study. These were considered straightforward questions for participants to answer as they were based on a recall of personal experience. If it was known that a question could have more than one response multi-variable question types were used; this enabled participants to select more than one response from the list of possible options, this was useful when indicating which features participants used the most. Single-variable question types were used for the remaining structured questions.

Two Likert-scale questions were used to measure participants' response to statements concerning their opinion toward features within the system. Participants were asked to indicate how they rate the eCourse interface features in terms of personal taste on a scale of:

Very good (value = 2)

Good (value = 1)

Neutral (value = 0)

Poor (value = -1)

Very poor (value = -2)

For the second Likert-scale question participants were asked to indicate how they rate the functionality features in terms of usefulness on a scale of:

Very useful (value = 2)

Useful (value = 1)

Neutral (value = 0)

Not useful (value = -1)

Not useful at all (value = -2)

These Likert-scales were also used in consecutive question sets so that a comparative analysis could be made from participant responses.

A text field was used to cater for an open-ended question which allowed participants to enter any other information that was considered important to the

participant’s current system usage hence offering the opportunity for participants to answer in their own words, revealing the real views of the participant (Fowler, 1993).

Figure 3-2: Survey screen capture – Current System Details

PARTICIPANT ID: [] >> CURRENT SYSTEM USAGE DETAILS << INTERFACE FEATURES | FUNCTIONALITY FEATURES | CUSTOMIZATION PREFERENCE & PRACTICES

CURRENT SYSTEM USAGE DETAILS

Please tell us about your current experience with eCourse

- How long have you been using the eCourse Portal?
 - Just started
 - 6 Months
 - 1 Year
 - 2 Years +
- Approximately how often do you access the eCourse Portal?
 - Once per week
 - 2-3 times per week
 - 4-5 times per week
 - Once per day
 - 2-3 times per day
 - 4+ per day
- From where have accessed eCourse?
(tick more than one if relevant)
 - Home
 - Work
 - University
 - Internet cafe
 - Overseas
- What features of the eCourse portal do you use the most?
(tick more than one if relevant)
 - Unit forums
 - General forums
 - Unit materials
 - Links to student email
 - Links to university resources
 - Personal messaging
 - Online assignment submission
 - Staff contact details search
- How would you currently rate the eCourse portal interface in terms of your personal taste?
 - Very good
 - Good
 - Neutral
 - Poor
 - Very poor
- How would you currently rate the functionality (features) contained within the eCourse portal in terms of usefulness?
 - Very useful
 - Useful
 - Neutral
 - Not useful
 - Not useful at all
- What other content management systems (like eCourse) have you used?
(tick more than one if relevant)
 - Blackboard
 - WebCT
 - ScamSyte
 - Other
- Please list any other usage details

Please check over and confirm your responses before you continue

3.2.3 Interface & Functionality Features

The ‘Interface Features’ and ‘Functionality Features’ question sets were predominately opinion-based questions and use a similar format of questions as each other. The Likert-scale question type was used, which enabled the collection of participants’ opinion in a quantitative response format making it easier to analyse (Trochim, 2002). Statement-based items were used in order to determine which customisable features participants’ desired.. The series of statements presented to participants required them to indicate how much they agreed with a particular statement. They were not forced to respond one way or the other where participants were able to indicate a neutral response if that is, in fact, how they truly felt (Trochim, 2002). Participants indicated their level of agreement to each statement on the following scale:

Strongly Agree (value = 2)

Agree (value = 1)

Neutral (value = 0)

Disagree (value = -1)

Strongly Disagree (value = -2)

Figure 3-3: Survey screen capture – Interface Features

PARTICIPANT DETAILS | CURRENT SYSTEM USAGE DETAILS | >>INTERFACE FEATURES<< | FUNCTIONALITY FEATURES | CUSTOMIZATION PREFERENCE & PRACTICES

INTERFACE FEATURES

Please indicate whether you would like to be able to customize the following interface features in a CMS such as eCourse.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
9. I would like to be able to...					
a) set my own colour scheme	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) set the background image of the page(s) I use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) choose an interface 'theme' from a series of predefined templates	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) use icons for functionality and navigation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) use text links for functionality and navigation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) select a different screen layout	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I am willing to spend as much time as is required to get the interface setup the way I like it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Please list any other interface features you would like to customize	<input type="text"/>				
12. How would you rate the eCourse portal interface in terms of personal taste if some or all of the above customizable features were available to you	<input type="radio"/> Very good	<input type="radio"/> Good	<input type="radio"/> Neutral	<input type="radio"/> Poor	<input type="radio"/> Very poor

Please check over and confirm your responses before you continue

Figure 3-4: Survey screen capture – Functionality Features

HOME > SURVEYING > CUSTOMIZATION PREFERENCE & PRACTICES > >>FUNCTIONALITY FEATURES<< | CUSTOMIZATION PREFERENCE & PRACTICES

FUNCTIONALITY FEATURES

Please indicate whether you would like to have the following functionality features available to you in a CMS such as eCourse

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
13. I would like the following features available to me:					
a) an online notepad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) website bookmarks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) a personal calendar & to-do-list	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) personalized news feed service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) ability to set and receive assignment due date or other personal reminders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) ability to see most recent postings on the message or forum discussion boards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g) live chat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h) unit notes update notification via email	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i) MSN style "Who's online" indicator	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j) list of most recently downloaded documents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k) unit materials search function	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l) recommendations based on other peoples searches	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
m) unit materials in various formats e.g textual, graphical or html	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
n) ability to set the language display <i>*The language option would only apply to content that is generally fixed such as the main navigation bar, links, headings or even the news feeds</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Please list any other functionality features you would like to customize	<input type="text"/>				
15. How would you rate the functionality (features) contained within the eCourse portal in terms of usefulness if some or all of the above customizable features were available to you	<input type="radio"/> Very useful	<input type="radio"/> Useful	<input type="radio"/> Neutral	<input type="radio"/> Not useful	<input type="radio"/> Not useful at all

Please check over and confirm your responses before you continue

3.2.4 Customisation Preference

Different question techniques were used in this question set to assess the participants value of preference (Alwin & Krosnick, 1989). Rating techniques employed in the Interface & Functionality question sets were used to gain an overall view of opinion towards various features were participants could score items equally (Alwin & Krosnick, 1989); Whereas the ranking format in this question set enabled participants to indicate there preference of an item over another (Alwin & Krosnick, 1989).

The questions in this set were dependant on the responses from questions 9(a-f) from the Interface Features question set and questions 13(a-n) from the Functionality Features question set. If a participant indicated that they either agreed or strongly agreed

with any of the statements in questions 9 and 13, each one was included as part of questions 16 and 17 respectively. Figure 3-5 illustrates question 16 containing three items, indicating that a participant responded agreeably to those three items in question 9. Question 16 requests the participant to rank the listed items in order of preference, in an incremental manner, by placing a number in each text box. If a participant did not respond favourably to any of the statements in question 9, question 16 acknowledges this and provides the participant with a large text field requesting the participant to comment on their decision (Figure 3-6).

Figure 3-5: Survey screen capture – Customisation Preference (Ranking)

PARTICIPANT DETAILS | CURRENT SYSTEM USAGE | SET ALG | FUTURE WORK | ATT | BR | L | EMAIL | QUALITY | FEEDBACK | >>CUSTOMIZATION PREFERENCE & PRACTICES<<

CUSTOMIZATION PREFERENCE

From your previous responses please indicate which features you have greater preference for.

16. You responded favourably to the following **INTERFACE FEATURES**. Could you please rank them in order of preference 1 being the highest preference and so on (a number can only occur once)

- set my own colour scheme
- use icons for functionality and navigation
- choose an interface 'theme' from a series of predefined templates

17. You responded favourably to the following **FUNCTIONALITY FEATURES**. Could you please rank them in order of preference 1 being the highest preference and so on (a number can only occur once)

- website bookmarks
- personalized news feed service
- list of most recently downloaded documents
- personal calendar & to-do-list
- unit notes update notification via email
- unit materials in various formats

Please check over and confirm your responses before you continue.

Figure 3-6: Survey screen capture – Customisation Preference (No Preference)

PARTICIPANT DETAILS | CURRENT SYSTEM USAGE | DETAILS | ENTER | ACK | FEEDBACK | FUTURE WORK | QUALITY | FEEDBACK | >>CUSTOMIZATION PREFERENCE & PRACTICES<<

CUSTOMIZATION PREFERENCE

From your previous responses please indicate which features you have greater preference for.

16. You did not respond favourably to any of the **INTERFACE FEATURES**. Please make a comment to support your decision

17. You did not respond favourably to any of the **FUNCTIONALITY FEATURES**. Please make a comment to support your decision

Please check over and confirm your responses before you continue.

This method of dynamic questioning was used to narrow down the number of items to be ranked and limit inaccurate ranking (Burgess, 2001). A participant is likely to respond more accurately if they are required to rank 5 items rather than all 13 items. Dr Burgess states that ranking questions “can generate a lot of data and so the number of options used should not be excessive. Apart from this respondents find it difficult to discriminate meaningfully between lots of options.”(Burgess, 2001, p.13). Further to this, if a participant did not indicate favour towards a feature, their preference ranking would not hold the same value as that of a preference ranking toward a favoured feature. Comparability between units from one attitude to another would not be possible (Oppenheim, 1966).

It was advantageous that the survey was program-driven and the development of dynamic questioning was feasible. A computer-based survey can follow complex question patterns that would be difficult to achieve in a paper-based version (Fowler, 1993). A paper-based survey would have required a series of hierarchical questions such that if a participant answered ‘*true*’ they would be asked to answer question ‘*x*’, whereas if they answer ‘*false*’ they would be asked to answer question ‘*y*’. The computer-based survey concealed these conditions and presented only the appropriate question.

3.3 Description of Instrument Employed

3.3.1 Online Survey

It was advantageous to develop an online survey tool for the purpose of this study. An online survey is technically feasible, ensures anonymity and is a convenient method of distribution and data storage.

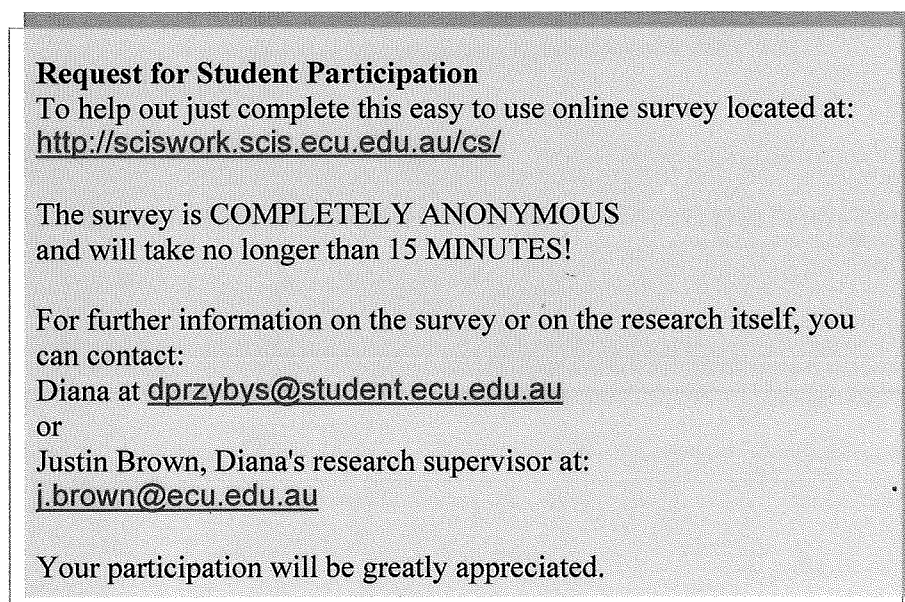
Several developed technologies were employed in the creation of the survey. Hyper text mark-up language (HTML) and Cascading Style Sheets (CSS) were used at the presentation level; displaying the content in a structured and aesthetically pleasing way. JavaScript code was used to validate data entries where participants would be notified of unanswered questions offering an opportunity to go back and respond. PHP code was used as the response processing mechanism between the presentation level of the survey, where participants input their response, and the back-end database, where the responses were stored. A MySQL database was employed to store all the data in a

set of normalised data tables. Conducting the survey via the Internet was advantageous as responses were instantaneously recorded in machine-readable form (Fowler, 1993). PHPMyAdmin was used to successfully construct and manage the contents of the database. The technologies employed are freely available and were suitably robust for the purposes of this study.

Once the survey was developed it was ready to be hosted and made available to prospective participants. The survey and database were hosted on a secure server where access was granted only to the researcher and the supervisor. To make the survey known to potential participants a notice was published on the CIT Intranet homepage and general forum (figure 3-7); and authorised posters (figure 3-8) were positioned in various locations around the CIT school building. Interested participants accessed the survey via the web site address (URL) provided.

Data collection occurred over the duration of two weeks. The online survey was constantly available enabling participants to complete the survey at a time convenient to them. This method of distribution allowed participants' time to formulate answers and potentially increase response rates (Trochim, 2002). No personal contact was made between the researcher and the participant nor were there any identification numbers as part of the survey; hence true anonymity was maintained (Babbie, 1973). It was hoped that the assurance of anonymity, combined with the convenience of online delivery, would increase the likelihood and accuracy of responses (Babbie, 1973).

Figure 3-7: Notice published on CIT Intranet Homepage



Request for Student Participation
To help out just complete this easy to use online survey located at:
<http://sciswork.scis.ecu.edu.au/cs/>

The survey is COMPLETELY ANONYMOUS
and will take no longer than 15 MINUTES!

For further information on the survey or on the research itself, you
can contact:
Diana at dprzybys@student.ecu.edu.au
or
Justin Brown, Diana's research supervisor at:
j.brown@ecu.edu.au

Your participation will be greatly appreciated.

Figure 3-8: Poster placed around CIT school building

Request for Fellow Student Participation

One of our SCIS Honours students would like 15 minutes of your time.

Diana is conducting research into user customisation of online systems, with online learning environments and portals as the focus.

It is not hard! It is not a test!

Any SCIS student can participate!

**To help out just complete this easy to use
online survey located at:**

<http://sciswork.scis.ecu.edu.au/cs/>

The survey is COMPLETELY ANONYMOUS
and will take no longer than 15 MINUTES !

So spread the word and help out a fellow SCIS student. For further information on the survey or on the research itself, you can contact Diana at:

dprzybys@student.ecu.edu.au

Or Justin Brown, Diana's research supervisor at:

j.brown@ecu.edu.au

Your participation will be greatly appreciated!

3.3.2 Amendments as a Result of Pilot Survey

After two days of data collection some data recording errors were identified. The timestamp feature in the database, used as a validation method, was not correctly recording participants' survey completion time. The specific table in the database and a few lines of code in the survey were modified to resolve the problem. Another problem was identified from participant feedback via a message posted on the general forum. The feedback in the validation method was designed to ensure participants answered each question, however it was identified that participants felt that each question was compulsory to answer. This could have lead to participants entering invalid responses to overcome the alert. The feedback was revised to state that it was possible to continue with the survey even though they had not answered all the questions. The amendments to the pilot survey led to the release of the main survey. Data collected from both pilot and main survey versions were used in the analysis.

3.3.3 Data Validation

Before analysis took place, methods were used to ensure data validity and reliability. Reliability of responses was controlled using a timestamp method, which recorded the time a participant started and completed the survey. If a participant's total time to complete the survey was considered to be very low then it is possible to say that their responses may not carry the same value as a longer, more considered survey completion. An initial standard deviation (SD) of 23 minutes identified a significant difference in the timestamps. For example one participant's total time to complete the survey reached 57 minutes. They responded to questions in-depth so it was not removed, but the timestamp was omitted. The SD dropped to 8 minutes with an average of 7 minutes. It was found that the responses of participants that took 4 minutes or less to complete the survey responded by selecting the first option for each question. It was considered that such an approach was not indicative of a thorough and thought-out survey completion; therefore those responses were omitted from the study. The data was then considered a more accurate representation of the population where the average time to complete the survey was 8.4 minutes with a SD of 3.1.

To further ensure data reliability, participants' responses were only included in the analysis phase if they met the following criteria:

- Participant details were complete: without fully completed participant details it would be difficult to accurately identify correlations between specific demographic groups and their responses.
- Participant answered up to and including question 15 and had no more than 2 other missing questions: with many of the questions to undergo a comparative analysis, only receiving partial data would render the responses ineffectual.
- The participant must have taken longer than 4 minutes to complete the survey: Since it appeared that those responses were not thorough and thought-out. This was only applicable to the main survey.

The total number of valid responses for the pilot survey was 41 and 44 for the main survey.

After general examination of the data from the two surveys it was found that the responses varied greatly where one survey had more novice users than the other and could not be directly compared. Considering that there were only minor technical differences between the two surveys it was decided to merge all the valid responses and categorise participants into novice and experienced CMS users. In total there were 19 novice and 66 experienced participants. Analysis of data between these two user categories identified some differences, which are explored in Chapter 4: Data Analysis.

CHAPTER 4

Data Analysis

This chapter examines the survey questions, their purpose and an analysis of data collected from the participants against these questions. The survey was broken down and structured into five questions sets being (Table 4-1);

Table 4-1: Survey Items

<u>Questions Set</u>	<u>Question Range</u>	<u>Purpose</u>
Participant Details	i - vii	Collect demographic details for correlative analysis
Current System Usage	1 - 8	Determine user experience with eCourse
Interface Features	9(a-f) -12	Discover participant opinion towards customisable interface features
Functionality Features	13(a-n) - 15	Discover participant opinion towards customisable functionality features
Customisation Preference	16 - 17	Discover participant preference of customisable interface and functionality features

Data was analysed from the response of 85 participants. The collected data is presented in tables that use the following key codes shown in Table 4-2.

Table 4-2: Survey Scale Items

<u>Key</u>	<u>Definition</u>	<u>Key</u>	<u>Definition</u>
VG	Very Good	NU	Not Useful
G	Good	NUAA	Not Useful At All
N	Neutral	SA	Strongly Agree
P	Poor	A	Agree
VP	Very Poor	D	Disagree
VU	Very Useful	SD	Strongly Disagree
U	Useful	N=	Number of respondents

4.1 Question Set 1: Participant Details

Demographic details were collected from survey participants to identify relationships between participants from specific demographic groups and their responses. Table 4-3 presents the collection of demographic data (see appendix). The sample population was diverse in age, nationality, gender as well as course of study and enrolment type. As the customisable features included in this research were designed to cater for the needs of a diverse student population, an understanding of that population was necessary.

4.2 Question Set 2: Current System Usage

In question 1, participants were asked to state their experience with eCourse. Participants were grouped into two categories; novice, meaning less than a semester experience with eCourse; and experienced, meaning more than one semester. User categories were further broken down into gender. In total there were:

- 5 female & 14 male in the novice category (19)
- 20 female & 46 males in the experienced category (66)

Presented in table 4-4 are the eCourse usage habits of participants, indicating that over 65% of novice users accessed eCourse from 2 to 4 plus times per day, whereas experienced users were more dispersed in their access habits with only 44% of experienced users accessing eCourse from 2 to 4 plus times per day.

Table 4-4: Response to question 2 (%) - Novice/Experienced user breakdown

Q2. Approximately how often do you access the eCourse Portal? (%)

	1 <u>p/wk</u>	2-3 <u>p/wk</u>	4-5 <u>p/wk</u>	1 <u>p/day</u>	2-3 <u>p/day</u>	4+ <u>p/day</u>
Novice (N = 19)	16	0	5	11	53	16
Experienced (N = 66)	2	20	21	14	30	14

Table 4-5: Response to question 2 (%) - Female/Male user breakdown

Q2. Approximately how often do you access the eCourse Portal? (%)

	1 <u>p/wk</u>	2-3 <u>p/wk</u>	4-5 <u>p/wk</u>	1 <u>p/day</u>	2-3 <u>p/day</u>	4+ <u>p/day</u>
Female (N = 25)	4	4	36	12	32	12
Male (N = 60)	5	20	10	13	37	15

The mean for access frequency was once per day for both female and male participants. However all (5) novice females accessed eCourse 2 to 4 plus times per day. Therefore it is rather a combination of the level of experience and gender that appeared to affect how frequently eCourse is accessed.

Response from question 3 indicated that 92% of participants have accessed eCourse from home as well as university (Table 4-6). This may be a result of student proximity to the campus facilities and their mode of study (online/on-campus).

Table 4-6: Overall response to question 3 (%)

Q3. From where have you accessed eCourse?

University	92
Home	92
Work	31
Overseas	11
Net Café	5

Question 4 was designed to determine which eCourse features participants used the most. The data indicated that features directly linked with academic work being; unit materials and online assignment submission were used the most with online communication via email and unit forums following in usage (Table 4-7 & 4-8).

Table 4-7: Response to question 4 (%) - Novice/Experienced user breakdown

Q 4. What features of the eCourse portal do you use the most? (%)

	Novice (N = 19)	Experienced (N = 65)
Unit materials	89	98
Online assignment submission	53	69
Links to student email	53	66
Unit forums	74	51
Links to university resources	53	45
General forums	37	48
Staff contact details search	26	29
Personal messaging	16	17

Table 4-8: Response to question 4 (%) - Female/Male user breakdown

Q 4. What features of the eCourse portal do you use the most? (%)

	Female (N = 25)	Male (N = 59)
Unit materials	100	95
Online assignment submission	72	63
Links to student email	76	58
Unit forums	68	51
Links to university resources	44	47
General forums	52	42
Staff contact details search	24	31
Personal messaging	24	14

The responses toward the use of the eCourse features differed across participant categories. Novice users' low response to the use of online assignment submission may be a result of not yet having an opportunity to utilise that feature. Novice users' strong response to the use of unit forums indicates a possible dependency on peer collaboration as a part of their study practice. The low response for the use of general forums indicates that these students would prefer to utilise communication features that directly assist them with their studies. Female participants utilised six of the eight surveyed eCourse features to a greater extent than their male counterparts.

The least used feature was personal messaging, in comparison with the high response for the link to student email, suggests that participants may prefer email to personal messaging for individual correspondence. This may be the result of the personal messaging feature in eCourse not offering any features to manage or control incoming and sent messages unlike the email system.

Question 5 sought participants' opinion of the eCourse interface in terms of personal taste. Overall 73% of participants felt that the eCourse interface was good with 14% rating it very good. Breaking the responses into participant categories (table 4-9) found that females liked the interface more than male participants with 88% responding that it was good or very good. Novice users were more indecisive with 32% of responses being neutral (table 4-10). Again males and experienced users followed a similar pattern of response with participants considering the interface good or very good but with more participants considering it poor or very poor. From the overall 85 participant sample population 23 (27%) of the responses indicated indecisiveness or disagreement suggesting that the current interface is not catering to the personal tastes of all respondents.

Table 4-9: Response to question 5 (%) - Female/Male user breakdown

Q5. How would you currently rate the eCourse portal interface in terms of your personal taste? (%)

	<u>VG</u>	<u>G</u>	<u>N</u>	<u>P</u>	<u>VP</u>
Female (N = 25)	12	76	8	4	0
Male (N = 60)	15	52	20	12	2

Table 4-10: Response to question 5 (%) - Novice/Experienced user breakdown

Q5. How would you currently rate the eCourse portal interface in terms of your personal taste? (%)

	<u>VG</u>	<u>G</u>	<u>N</u>	<u>P</u>	<u>VP</u>
Novice (N = 19)	5	58	32	5	0
Experienced (N = 66)	17	59	12	11	2

The eCourse CMS provides students with functionality features to assist them with their work. Question 6 was designed to discover participants' opinion of the features offered in eCourse in terms of usefulness. Overall 83% of participants felt that the features offered are useful or very useful with marginal differences between participant categories (Table 4-11).

Table 4-11: Overall response to question 6 (%)

Q6. How would you currently rate the functionality (features) contained within the eCourse portal in terms of usefulness? (%)

	<u>VU</u>	<u>U</u>	<u>N</u>	<u>NU</u>	<u>NUAA</u>
Overall (N = 85)	19	64	12	4	1

Question 7 asked participants to indicate which, if any, other CMS environments they had prior experience with. Response was very low indicating that only a small percentage of participants have had experience with other CMS (Table 4-12).

Table 4-12: Overall response to question 7 (%)

Q 7. What other content management systems (like eCourse) have you used? (%)

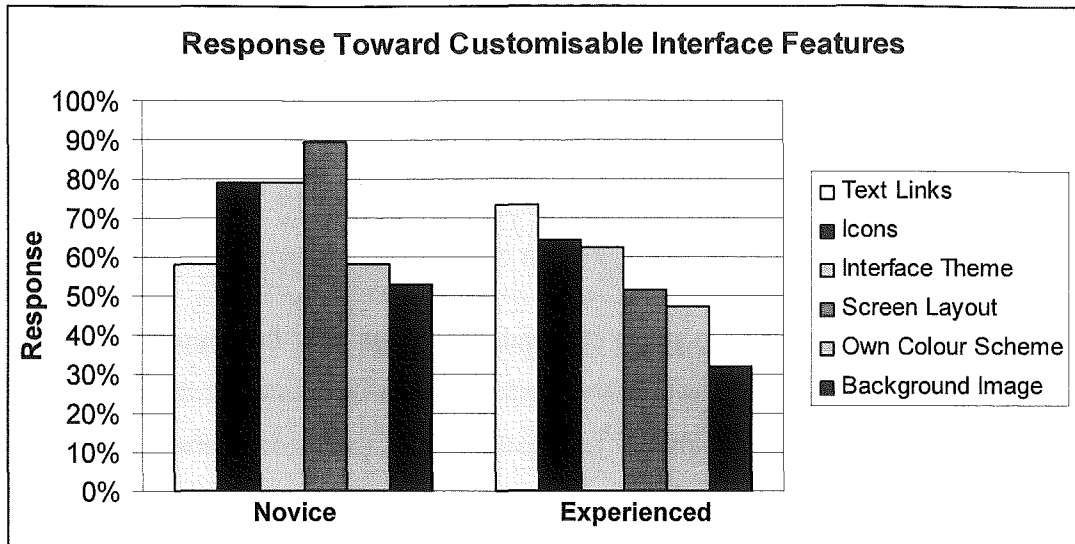
No Response	44
Blackboard	21
WebCT	20
ScamSyte	16
Other	13

Question 8 asked participants to list any other usage details. Only 10 (8.5%) of participants entered a comment. Three participants noted NetG, which is a self-paced online learning system that allows students to work through learning materials outside of those offered in their enrolled units. NetG offers progress tracking of learning materials and self tests but is not mediated by a lecturer or tutor. This system is used as a learning resource rather than a course management system. One comment directed the analysis of question 7 which stated they hadn't used another CMS therefore selected 'other' as equivalent to none. One participant suggested for the email system to be integrated with eCourse, again indicating the importance of email system to students within the university.

4.3 Question Set 3: Interface Features

Participants were requested to respond as to whether they would use any of the six presented interface features to customise the eCourse interface. Table 4-13 (see appendix) presents the responses from question 9. Figure 4-1 represents the data as a bar graph to show the varying popularity between participant categories.

Figure 4-1: Response toward customisable interface features



There was a disparity amongst participant categories in their desire to customise the eCourse interface. The ability to customise the interface was very popular for novice users. The three most popular features was the ability to customise the screen layout, the use of icons for functionality & navigation and the ability to apply an interface theme with 89%, 79% and 79% of responses respectively. Experienced participants were not as in favour of customising the eCourse interface, with their three most popular features being the use of text links then icons for functionality & navigation and the ability to apply an interface theme with 73%, 64% and 63% of responses respectively. The disparity here is that novice users appear to want control over the screen layout whilst experienced users did not; furthermore experienced users strongly desired the use of text links whereas novice users did not.

The difference between female and male participants was not as big as described for novice and experienced participants. Females responded more favourably to customising the interface than males. Female participants responded strongly toward the use of icons followed by text links for functionality & navigation and the ability to customise the screen layout with 76%, 72% and 68% respectively. Whereas male participants responded favourably to the use of text links for functionality & navigation, the ability to change the interface theme, and then the use of icons with 69%, 67% and 64% respectively.

Setting one's own colour scheme and background image were consistently less popular, than the other interface features, across all participant categories.

Even though participants in each category showed a desire to customise the interface, three features are notably more popular. The ability to interchange between text links and icons would seem to appeal to all users. The ability to apply an interface theme from predefined templates suggests that users would like to personalise the graphics of the system for personal appeal but also would like to select a different screen layout to improve usability, or to make the process quicker and easier.

From question 10 it was found that 40% of the overall survey population would spend as much time as required to get the interface just the way they like it. However the degree varied across participant categories. Novice users either agreed (47%) or remained neutral (47%) whilst experienced users opinion ranged from a 40% agreement to a 35% disagreement with 24% remaining neutral. Male participants responded similarly as experienced participants with 37% agreeing and 33% disagreeing. Of females participants 52% were willing spend as much time as required to get the interface just the way they like it, however 20% would not. Question 10 primarily asked participants to judge their priority in terms of time and effort for the customisation of the system to suit their needs. The relatively high neutral and negative response indicates that participants may have found it difficult to presume and assess their priority of something they have not experienced. It could also indicate that even though participants would customise their personal settings they would not spend excessive time in doing so. If it takes too long or is too difficult then they probably would not customise it. This idea in turn could be related to the strong positive response to the option of 'themes' that allow users to select from a variety of ready to go graphical interfaces.

The open ended style for question 11 asked participants to list any other interface features they would like to customise. Nearly one third (29%) of the participants entered a comment;

- 5 participants expressed their concern toward technical and maintenance issues
- 4 participants suggested enhancement of the forums
- 3 participants (1 having made two comments) expressed that they were happy with the system or didn't care for customisation of the interface as long as they could do what they needed to
- 2 participants suggested the ability to change font size
- 2 participants wished for eCourse to be integrated with other university systems
- 2 participants suggested the ability to manage unused links or functions
- 2 participants pre-empted customisable functionality features that followed in the next question set
- 1 participant suggested the ability to have background music
- 1 participant suggested specific cross browser features

Having established participant reaction to a number of customisable interface features, question 12 was designed to determine participants' opinion of the eCourse interface, in terms of personal taste, if some or all of their desired customisable features were available to them. Overall 79% of participants felt that the interface would be good with 24% considering it would be very good if the customisable features were available to them (Table 4-14 & 4-15). When compared (Tables 4-9 & 4-10), participants' opinion of the eCourse interface appears to have improved after the notion of having their desired customisable features were available to them.

Table 4-14: Response to question 12 (%) - Novice/Experienced user breakdown

Q 12. How would you rate the eCourse portal interface in terms of personal taste if some or all of the above customisable interface features were available to you (%)

	<u>VG</u>	<u>G</u>	<u>N</u>	<u>P</u>	<u>VP</u>
Novice (N = 19)	32	53	16	0	0
Experienced (N = 66)	21	53	21	2	3

Table 4-15: Response to question 12 (%) - Female/Male user breakdown

Q 12. How would you rate the eCourse portal interface in terms of personal taste if some or all of the above customisable interface features were available to you (%)

	<u>VG</u>	<u>G</u>	<u>N</u>	<u>P</u>	<u>VP</u>
Female (N = 25)	24	56	20	0	0
Male (N = 60)	23	52	20	2	3

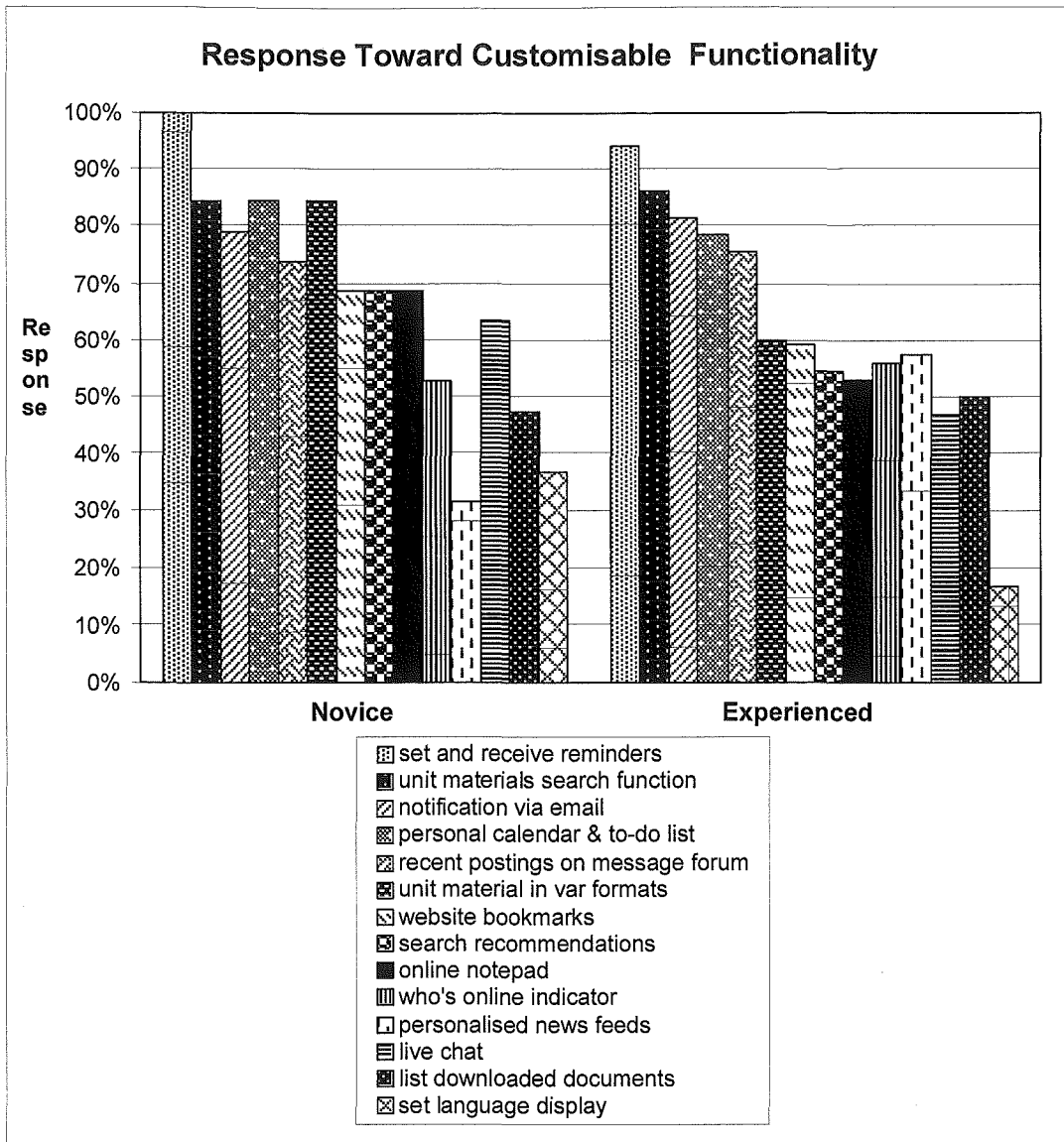
This suggests that participants would appreciate eCourse to a greater extent if features such as text links, icons, the ability to select a different screen layout and graphical themes were integrated with the system. These features improve accessibility, useability and create a personalised environment for each user.

4.4 Question Set 4: Functionality Features

Question 13 presented 14 customisable functionality features and requested participants to respond as to whether they would like these features made available to them. The 14 customisable functionality features have been graphed in Figure 4-2 based on the data in Table 4-16 (situated in the appendix).

The popularity toward customisable functionality features was high across all participant categories. The stark difference between novice and experienced users toward interface features was not reciprocated in the responses toward the functionality features; where experienced users favour toward functionality features was higher than for interface features.

Figure 4-2: Response toward customisable functionality features



The most agreed to functionality features with an overall 95% agreement was the ability to set and receive assignment due date or other personal reminders. This feature provides a student with reminders that help maintain a timely schedule with their study and personal business. All novice users agreed that they would like to have this feature available to them, with 58% strongly agreeing. This would indicate that these participants have acknowledged the importance of time management for the timely completion of assigned work. Students, both full-time and part-time, balance a busy schedule, which may include working on up to 4 assignments simultaneously as a full-time study load.

The second and third most popular features relate to the assistance of students' study programme i.e. a unit materials search function and notification of updated unit

notes via email. The search function enables a student to promptly locate specific information amongst weekly materials. This could assist students' study programme during review periods, final assignments and exam preparation. User63 suggested "Full text search across all unit material, with an advanced search engine". Notification of updated unit materials via email could assist the lecturer as well as the student, replacing the current method of students having to log into eCourse several times in order to see whether new materials have been posted. Once students from a unit have been notified that new materials have been posted, they can then schedule their study programme more effectively.

A personal calendar & to-do-list was the fourth most agreed upon functionality feature with an overall 80% response. This feature follows the trend of features that assist with students study programme, workload management and overall organisation. This need to be organised, is one of the university's fundamental learning outcomes. User35 commented "If a to-do list / personal calendar was implemented the ability to export/import to and from Outlook would be nice".

Notification and communication appears to be the following trend after organisation. 80% of the overall sample population responded favourably toward the ability to receive notification of new materials via email and 75% responded favourably toward the ability to see most recent postings on the message or forum discussion boards. User4 suggested "forum thread identification such as Read, Unread, and New Post Added". Students' frequent use of the unit forums, previously indicated, may have been the drive behind the popular desire toward the customisable forum feature in order to make communication easier and more efficient.

The four most popular functionality features indicate that organisation and communication are important factors to students. The information and resource features overall only achieved 49-61% of participant agreement. Features such as website bookmarks marks, recommendations based on other people's searches and personalised news feeds were not as desirable to the majority of the population as the communication and organisational features were. The data indicates that students are more interested in features that are going to assist them to work with and manage their study workload.

Further analysis of the data indicated a disparity between novice and experienced CMS users where novice users were in favour of having unit materials available in various formats and experienced users not. This may be because surveyed

experienced users have been studying computer science and better understand the implications this features has on maintenance, such as version control, as well as the power and versatility of PDF documents hence the lack of agreement for materials to be made available in various formats (PowerPoint, RTF, HTML).

The least favoured feature was the ability to set the language display. Of the 23% who favoured customisation of language display 50% were Australian, 16% were Australian of overseas descent, while the remaining 33% were not Australian i.e. one from each of the following nationalities: Burundian, Indian, Kenyan, Sri Lankan, Indonesian and Zimbabwean. The data indicates that only 39% of participants who came from non-English speaking countries agreed to want to be able to customise the language display. Australians seemed to want to customise the language display more than international students. International students may have responded this way since an academic level of English is required to study at the university and they are probably comfortable with English.

Participants were then requested to comment as to whether there were any other functionality features they would like to customise. The 16 participant responses are as follows:

- 3 participants commented on other system issues
 - The use of calendar dates not academic weeks
 - No time out after 5 minutes
 - Access to materials for previously enrolled units
- 2 participants suggested the ability to create private forums for collaborative teamwork.
- Full text search across all unit material with advanced search engine
- To-do-list to be interoperable with Microsoft Outlook
- Ability to change font (interface feature)
- Number of people currently logged in (might indicate heavy forum users)
- Learning plan and feedback

- None, happy with the features it has
- Sending SMS messages to people in the school
- Output statistics and graphs, time of day
- Yahoo messenger instead of MSN

The comments suggesting the ability to create forum groups and the to-do-list to be interoperable with outlook reiterates the recurring theme of organisation and communication being paramount to the participants.

Question 15 was designed to determine participants' opinion of the features in eCourse in terms of usefulness if some or all of their desired customisable features, from question 13, were available to them. Table 4-17 indicates an overall 91% strong response for the functionality features in eCourse portal to be useful with 49% very useful.

Table 4-17: Response to question 15 (%) - Novice/Experienced user breakdown

Q 15. How would you rate the functionality (features) contained within the eCourse portal in terms of usefulness if some or all of the above customizable features were available to you

	<u>VU</u>	<u>U</u>	<u>N</u>	<u>NU</u>	<u>NUAA</u>
Novice (N = 19)	53	37	11	0	0
Experienced (N = 64)	48	44	6	2	0

4.5 Question Set 5: Customisation Preference

From the list of popular customisable interface and functionality features, participants indicated they would like to have available to them, a ranking system was implemented to determine their preference of these features. A count of participants who ranked an interface or functionality feature first or second is presented in tables 4-18 and 4-19 respectively.

Table 4-18: First or second preference count against the most preferred customisable interface features

<u>Feature</u>	<u>1st or 2nd preference</u>
use icons for functionality and navigation	27
set my own colour scheme	25
use text links for functionality and navigation	23
choose an interface 'theme' from a series of predefined templates	22
select a different screen layout	21
set the background image of the page(s) I use	9

There was only a marginal difference between preferences across the five top interface features (Table 4-18) suggesting that an assortment of customisable interface features would be required in order to cater for students' diverse needs.

Results from the preference ranking indicated that, in some cases, 'preference' could dominate 'popularity'. The ability to set one's own colour scheme was the second least popular interface feature for all participant categories; however it received a high level of preference from experienced and male users. The notable preference to set one's own colour scheme and select a different screen layout in consideration to the high popularity and average preference toward the use of 'themes' suggests users would like to maintain a level of control over their study portal interface. Similarly the stronger popularity for the use of text links was outweighed with the high preference for the use of icons for functionality and navigation. In this case the data suggests that the ability to interchange between text links and icons would greatly accommodate the differing user

needs. Overall the allocation of preference reduced the gap between five interface features and made them equally important.

The ability to set the background image was the least popular and least preferred of the six interface features. In the context of the whole sample population 11% ranked it first or second.

The preference toward customisable functionality features was more defined than the preference toward the interface features. Table 4-19 presents the preference of six notable customisable functionality features, indicating the two most preferred features being the personal calendar and to-do list and the ability to set and receive assignment due date or other personal reminders.

Table 4-19: First or second preference count against the most preferred customisable functionality features

Count of participants who offered 1 st or 2 nd preference against the six most preferred customisable functionality features	
<u>Feature Description</u>	<u>1st or 2nd preference</u>
a personal calendar & to-do-list	31
ability to set and receive assignment due date or other personal reminders	31
unit notes update notification via email	20
unit materials search function	15
an online notepad	13
ability to see most recent postings on the message or forum discussion boards	11

The personal calendar and to-do list had 31 respondents selecting it as their first or second preference. The ability to set and receive assignment due date or other personal reminders received the same number of respondents however since the calendar and to-do list feature had a lower popularity (figure 4-2) this suggests that this feature was considered to be of greater importance.

Features following in preference were the unit update notification via email; the unit materials search function and the online notepad.

The preference level was low toward the ability to see the most recent postings on the forum discussion board. However, in comparison with the other surveyed functionality features, this feature does not seem to offer the equivalent functionality and usefulness. This suggests that participants do desire a customisable feature for the discussion boards but would prefer it to be more functional.

From several comments received from participants, the following two features were suggested for the discussion boards:

- the ability to create private forums for collaborative team work
- the identification of new, read and unread messages with the ability to delete messages

The remaining eight functionality features were preferred only by a minority of participants being 11 to 3 people of the whole sample population (Table 4-20). The data indicates that students are interested in features that are functional and will directly assist them with their studies.

Table 4-20: First or second preference count against the less preferred customisable functionality features

Count of participants who offered 1st or 2nd preference against the remaining less preferred customisable functionality features

<u>Feature Description</u>	<u>1st or 2nd preference</u>
website bookmarks	11
unit materials in various formats	7
Live chat	7
Personalized news feeds	6
"Who's online" indicator	5
List of downloaded documents	5
recommendations based on other peoples searches	3
ability to set the language display	3

4.6 Summary

It has become apparent that the survey participants have various needs, usage habits and experience with eCourse. Their diversity has been reflected in their opinion towards the visual appeal of the eCourse interface and usefulness of its functionality features, furthermore in the distinct ways in which users desire to customise their study portal.

The customisable interface features which participants desired to use differed between novice and experienced users. The desire to customise the interface was more popular amongst novice users than experienced users. The use of icons and the ability to change the interface theme from a set of predefined templates was popular for all participants. However the ability to change the screen layout was more appealing to novice users whilst the use of text links for functionality and navigation was more appealing for experienced users. After participants ranked their desired interface features in order of preference there was only a marginal difference between the top five interface features.

Responses were more favourable and consistent amongst participants toward customisable functionality features. Features associated with organization, communication and efficiency were more popular than features associated with resources and information. Results from the preference ranking identified the calendar and to-do list function along with the due date reminder function to be the two notably preferred functionality features. Communication via email and discussion forums also gained a favourable response with several participants commenting on the need for functionality features within the discussion forums.

Participants were not as concerned with the visual appeal of the interface as they were with the usefulness of eCourse. Users of the eCourse preferred customisable features that assist with carrying out tasks relevant to a learning environment, their studies. After the notion of including the desired customisable interface and functionality features within eCourse participants' opinion improved notably.

CHAPTER 5

Discussion

The following discussion considers the data collected from the survey and review of literature in the light of the research questions of the study being:

Q1. Which customisable features do students prefer within a CMS?

Q2. What are the surrounding opinions users have toward system customisation?

Areas of interest arose in the areas of computer mediated communication, workload management, visual interface styles, text links and icons, variation in opinions towards customisable features and issues surrounding the response of female survey participants.

5.1 Computer Mediated Communication

Survey participants indicated that the most frequently used communication tools within eCourse were email and unit forums, with these two items receiving higher response than general forums and the personal messaging tool. When participants were asked to express their reactions to customisable features, in relation to these communication tools, once again email and unit forums received more affirmative responses than other functions, such as an online notepad or live chat. As Beimans (2003) found that the more email was used the more it was customised, the data from this study suggests that students would appreciate the ability to customise communication features that they use frequently

The difference between the surveyed communication features is the time frame in which the exchange of messages occurs, whether it's private or public, the number of people involved and whether messages are archived for future reference. Even though live chat facilitates the ability to send and receive immediate response to a message, it may not have been popular since it is difficult to synchronise communication times. Furthermore students may prefer to use the common and freely available instant

messaging (IM) software that is suitable for personal and study related work rather than opting to use school recourse for personal use. Mock (2001) found that of 35 survey participants only 35% used IM software for class work, although all but one considered IM software to be between somewhat useful and very useful.

5.1.1 Forums

Discussion forums were well received by participants in this study. Participants' strong responses toward discussion forums may be due to the ability of forums to foster community and collaborative work. Questions and answers posted in the unit discussion forums can benefit all students, particularly those wishing to pose a similar question. From all surveyed participants 63% used the unit forums frequently and 75% desired better useability features to manage the volume of posts. Mocks' study (2001) found that 86% students considered discussion boards somewhat or very useful. Discussion forums offer the ability to carry out discussions over an extended period of time, which allows students to respond at a time convenient to them. However a student may opt not to use the discussion forum because of its public nature where they may feel apprehensive to participate due to public scrutiny of their posts (Mock, 2001). To cater for this, some discussion forums enable anonymous postings and others offer the ability to create smaller private forums designed for grouped team work (WCET, 2005).

5.1.2 Email

Email is a common form of computer-mediated communication used for social, business and study purposes (Biemans et al., 2003). Email enables large amounts of information to be distributed either privately, or to any number of recipients. It also acts as a means of archiving information for future reference. The convenience of email could be a factor as to why the response toward the use of email and the desire to receive notification via email was highly favoured by students. CU and OCLC both offer customisable email notification that alerts a user of important information. If a user is emailed it is more likely they will receive and act on that information than if they had to actively seek it out.

5.2 Centralised Workload Management

The study indicated that there was greater preference towards features that directly impact on study workload organisation. Out of the 14 surveyed features, there was a strong preference towards personal calendars and to-do lists, and automated reminders for important due dates and personal notifications. This demonstrates a need for students to have greater organisational capacity within a CMS. As Wolz (1997) indicated, organisational tools such as calendars, appointment books, to-do lists and various other scheduling aids help students plan their time, deliver results and meet deadlines.

Currently, eCourse only offers a static calendar controlled by the unit facilitator, with no customisability on the student's part. The research data suggests that eCourse would prove to be of greater usefulness if it offered a more student-centred calendar system, where the students are able to add their own dates and reminders. One respondent further suggested interoperability with Microsoft Outlook; this would enable synchronisation to occur between the eCourse calendar and that of the student's existing calendar system.

The preference towards task or 'to-do' lists indicates that students have a need for keeping track of their tasks, in the same way that they keep track of dates via the calendar. Again, this study would suggest that such an addition would enhance eCourse's usefulness, as it currently lacks a task monitoring facility. The to-do list would offer students the ability to keep an ongoing index of projects, assignments and personal tasks that could be 'ticked off' as they are completed. Self-satisfaction for the student could be gained from crossing off tasks from a list and further encourages the completion of future tasks. The to-do list also assists in the prioritisation of work to be completed as the student can see, at a glance all that needs to be done and thereby is able to organise according to importance.

With a demand indicated for greater student-centred control of calendars, schedules and to-do lists, there is an opportunity for CMS to change the passive culture that seems to be prevalent. This study suggests that students would prefer to use the CMS as a complete 'study' portal, where they are able to manage their own workload from a central point. Where personal calendars, reminders and notifications, to-do lists and other general functions would allow students' to personally organise and keep track of their study load. Having all these means of organisation available, in a single

centralised location, the students would be able to manage their time and tasks more effectively and efficiently since they can see all that affects their workload in one place.

5.3 Themes and Visual Styles

The data gathered for this research indicates that participants appreciate the ability to customise the presentation of their interface, however do not consider it the highest priority. This means that they choose not to spend excessive time ‘tweaking’ the interface to suit their tastes. Just less than two thirds (60%), of the sample population, indicated that they would not spend as much time as was needed to get the interface ‘just the way they like it’. In fact, selecting such features as customised colour schemes and background images had the least response of surveyed customisable interface features, particularly for experienced users. Student responses indicate that they would rather apply a theme from a series of predefined templates rather than author their own interface. However, experienced users indicated that they would prefer to maintain an element of control with the ability to set their own colour scheme.

There was a strong response from survey participants towards the ability to customise the interface, but the data also indicated that participants were not generally willing to put in the time to do so, therefore the idea of pre-packaged ‘themes’ would be the most suitable means of customising the interface. Themes are typically a set of pre-defined visual, and sometimes aural, styles that the user can implement quickly and easily. This would save students the effort of customising individual elements of the interface, thereby reducing the amount of time spent. So whilst the desire to individually customise the look and feel of the interface was indicated support, the ability to have pre-packaged themes readily available drew greater response from the participants.

It would seem that themes would enable users with little time or low technical literacy to quickly customise their interface. There are a number of open-source online systems, such as MoveableType and Word Press that offer themes as standard practice. They allow the user to select from a library of pre-designed themes to customise their interface in quick, easy steps. However, should the user have the technical skills, they are able to design their own theme. These themes can then be shared amongst other users seeking to customise. The popularity of these open-source sharing methods can be seen simply by visiting one of the many development sites dedicated to theme design

for these systems. The popularity of themes is such that there is a viable market for their development and sale (Wardell, 2002).

From the data gathered, it is evident that students would appreciate the ability to quickly customise the interface to suit their tastes. This feature would be a welcome addition to eCourse as the HCI community states that an aesthetically pleasing interface promotes the successful completion of tasks and enhances the end user experience (Norman, 2002).

5.4 Text links and Icons

There was a divided popularity between the use of text links and icons for navigation and functionality. This study found that experienced users responded favourably to both the use of text links and icons, whereas novice users responded favourably only toward the use of icons. Data from the preference ranking system indicated that the use of icons was considered the most preferred interface features overall, with the preference towards the use of text links being marginal.

The review of literature indicates that either text links or icons can be used for navigation and functionality however text links should be used in case a clear description of a function is to be compromised (Raskin, 2000; Ravden & Johnson, 1989). HCI authors have offered various suggestions to the preference of novice and experienced users in the use of text links or icons. Shneiderman (1982) considered icons to be enjoyable for all since they are easy to learn by novice users and fast to use by experienced users; However Shih & Alessi (1994) claim that text links have a lower cognitive load and may be preferred by novice users. Both of these claims are probably relevant where the reason behind why a user chooses text links or icons will vary, thus lending support to the ability to interchange between text and icons in order to accommodate for various users with various needs.

5.5 Variation in Opinions

Novice and experienced eCourse users have a difference of opinion toward the inclusion of customisable features to the system. This discussion looks at shifts of opinion toward eCourse as it was and as it would be with the inclusion of customisable features and speculates on what customisation means for various users.

Table 5-1 presents the shift in opinion, for novice and experienced users, if desired customisable interface features were made available in eCourse.

Table 5-1: Participant response before and after the notion of including customisable interface features in eCourse

	Novice (N = 19)		Experienced (N = 66)	
	<u>before</u>	<u>after</u>	<u>before</u>	<u>after</u>
VG	5%	32%	17%	21%
G	58%	53%	59%	53%
N	32%	16%	12%	21%
P	5%	0%	11%	2%
VP	0%	0%	2%	3%

The data indicates that the ability to customise the interface strongly appeals to novice users. The 21% increase resulted in an 84% positive rating with 32% being Very Good. User 9 from the novice category commented that the system “should be more user friendly”; the strong preference towards the ability to select a different screen layout and the use of icons suggests that the inclusion of these desired customisable interface features will satisfactorily meet the needs of novice user and enhance their experience.

The shift of opinion for experienced users was more varied. Participants shifted from good to very good or from poor to very good indicating that customisation of interface features would have a positive effect on the system. However 21% (14) of experienced users had a declined shift of opinion. The opinion of 13 participants’ shifted by one degree from either VG to G or G to Neither. From the data and participants feedback some reason behind their decline in opinion have been speculated.

Experienced users may have felt:

- unsure of the effect customisation will have on the system
- that the system interface didn't need improving: User 41 "I'm happy with the way it is"; User 32p "I guess these are not important to me"
- that the addition of customisable interface features would over complicate the system: User 64 "There are occasional technical problems with eCourse and if there were that making it customisable would increase these, I would strongly disagree – it isn't there to look pretty !"
- concerned about technical hindrance: User 35 "Customisation is not a necessity and will make support a nightmare"

User 6 from the experienced user category was the only participant to shift their opinion from G to Very Poor. His comment "minimal images, fast loading times" suggests that he is technically concerned about the download of interface features. It is likely that this directly affected his shift in opinion. It is important to remember that customisable features could benefit users who are concerned with download speed. If a user were using a dial-up Internet connection customisation would allow them to switch to text-based interface, whilst a broadband user may prefer to use a complete graphical interface. Therefore the issue User 6 raised lends itself as an example to show how a customisable interface could benefit a user, not just in the sense of 'look and feel' but of actual usability.

As discussed in Chapter 2 an end user is not necessarily technically minded rather a general user of a system to carry out tasks. Technical feasibility is an undeniable issue that needs to be addressed in further studies however the purpose of this study is to determine which features CMS users want to be able to customise, not the technical feasibility of customisation. Novice users demonstrate the attitude of end users that may not be as technically minded as the experienced users that have developed technical knowledge from their field of study being computer and information science. These differing opinions demonstrate the issues raised in EUC (end user computing) where system designers may forget what it is like to be a novice user, an end user (B. A. Myers, 1994). Hence they can become restricted from pushing the

boundaries of possibility and exploring feasibility in technical stability instead of deeming it not possible.

Table 5-2 displays the shift in opinion, for novice and experienced users, if desired customisable functionality features were included in eCourse. There was an overall 29% shift of opinion to very useful. Novice users were considerably more optimistic that the system would be more useful with a 42% increase to Very Useful. The shift in opinion for experienced users was not as steep since their opinion of the existing functionality of eCourse was higher than novice users. Consequently 89% of novice users and 89% of experienced users agreed that the system would be either useful or very useful if customisable functionality features were available to them.

Table 5-2 : Participant response before and after the notion of including customisable functionality features in eCourse

	Novice (N = 19)		Experienced (N = 66)	
	<u>before</u>	<u>after</u>	<u>before</u>	<u>after</u>
VG	11%	53%	21%	47%
G	68%	37%	62%	42%
N	21%	11%	9%	6%
P	0%	0%	5%	2%
VP	0%	0%	2%	0%

The data indicates that the inclusion of customisable functionality features evidently appeals to a majority of system users. User 47, an experienced user from the pilot study, only selected four of the thirteen customisable functionality features which influenced their opinion of the system to rise to ‘Very Useful’ after they considered the eCourse to be ‘Not Useful At All’. The four features were associated with organisation and communication, this suggests that even the inclusion of a few key customisable features the systems useability can dramatically improve.

5.6 Gender Issues

Novice females in particular accessed eCourse several times per day whereas this data was not replicated for their male counterparts. Table 4-8 indicated that females used six of the eight surveyed eCourse features 5% to 18% more than their male counterparts. This may indicate that females in their early stage of study are more studious than their male counterparts, or feel a greater reliance on the CMS system to keep informed in their studies. Mathis (2002) addresses the issue of first year women undergraduates' low perceptions of their computer skills in computer science bachelor's degrees. Mathis' study was able to improve women's perception of their computing skills, however not their level of confidence. Kurman's (2004) study confirms Beyers' (1990) findings indicating that females underestimate their performance and have lower self confidence than males in stereo-typed masculine tasks in education such as math.. Novice females more frequent access to eCourse, combined with Kurman's findings suggests novice females in the field of computer science maybe more studious in the early stages of their degree to counteract the low perception of their ability.

5.7 Summary

It is evident that students do wish to customise features within eCourse. Surveyed students preferred functionality features that would assist them with scheduling and time management as well as maintaining an organised means of communication. Organisation and scheduling tools including the calendar, to-do lists, reminders and notifications were preferred functionality features since they assist students plan their time, meet deadlines and deliver results (Wolz et al., 1997). Unit forums and email were the popular means of communication and participants preferred to customise these tools. It was presumed that preference to customise these features was due to the frequent use of these communication features and their convenience (Mock, 2001).

Students responded favourably toward customising the eCourse interface. An aesthetically pleasing interface promotes the successful completion of tasks and enhances the end user experience (Norman, 2002). However it seems that students are not prepared to spend excessive time in doing so. As a result the ability to select a predefined theme was a preferred means of customising the look and feel of the GUI.

The preference toward icons and text links was divided. Varying opinions indicate that it is not possible to predict what a user may choose to use therefore the ability to interchange between text links and icons would accommodate for users various needs.

The comparison of participant opinion indicated differing views between user categories and the inclusion of various types of customisable features. The inclusion of interface features such as; the ability to select a different screen layout and the use of icons for functionality and navigation, had a positive impact on the opinion of novice users' being a 21% increase, totalling 84%, of novice user considering the eCourse to be good or very good. There was a stronger decline in opinion for experienced users with the inclusion of customisable interface features with several participants expressing their concern for technical feasibility and system management. It has been speculated that experienced participant's technical knowledge of computer systems, due to their formal studies, may have altered their perspective when answering questions on customisation. Overall it is evident that the ability to customise the interface would still satisfy the novice user even though experience users have differing views.

CHAPTER 6

Conclusion

The study has revealed a matrix of end user categories and their corresponding preference toward customisation. Due to the complexities of the human-computer relationship explored in section 2.3, end user preference toward interface features varied. The notion of customising the interface was more favored by novice users. This does not suggest that these features are not as noteworthy rather it exemplifies the importance to employ these features to accommodate for the diverse needs of the end user population. Consequently several surveyed interface features received similar end user preference.

End users indicated that functionality features associated with communication and organisation were the most preferred. There was a centralised view that end users desired features that would directly assist them carry out tasks they wished to accomplish. Morgan, cited in Ferguson et al. (2004), claimed that there should be a focus on the tasks end users need or want to accomplish and that customisation should be used to balance generic web sites to enhance a user's experience; this statement supports the findings in this study. End users have indicated a preference toward customisable features that are task orientated and the ability to utilise these features in a way that suits there needs consequently enhancing their experience.

These findings suggest that it would be possible to apply these results to other task driven CMS's. The customisable features explored in this study are used in other CMS in various combinations (WCET. (2005), therefore the findings in this study could apply and benefit the further advancement of these CMS, implementing customisable features that suit the needs of the end user.

It is recommended that further research should be carried out in regards to the technical feasibility of employing the preferred features into a CMS; as well as a study of the utilisation and impact these features have on the end user population. The development of an experimental prototype would enable a researcher to explore various programming techniques to ensure system stability, and then release the prototype on a sample of the end user population in order to test the level of end user satisfaction.

This study provides a roadmap against which customisation features and functions could be developed for online learning environments and course management systems. The focus of such customisation should be productivity over visual allure, practicality over appeal.

REFERENCES

- Alwin, D. F., & Krosnick, J. A. (1989). Ratings and Rankings. In E. Singer & S. Presser (Eds.), *Survey Research Methods*. Chicago and London: University of Chicago Press.
- Babbie, E. R. (1973). *Survey Research Methods*: Wadsworth Publishing Company.
- Benjamin. (1982). Information technology in the 1990's: A Long range planning scenario. *MIS Quaterly*, 6(2), 11-26.
- Beyer, s. (1990). Gender differences in the accuracy of self evaluation of performance. *Journal of Personality and Social Psychology*, 59, 960-970.
- Biemans, M., Schuurman, J. G., & Swak, J. (2003). *Evaluation of user customisation in e-mail and mobile telephones*. Retrieved 28 August, 2004, from https://doc.telin.nl/dscgi/ds.py/Get/File-14481/evaluation_of_user_customisation_in_e-mail_and_mobile_telephones.pdf
- Botev, C., Chao, H., Chao, T., Cheng, Y., Doyle, R., Grankin, S., et al. (2005). *Supporting Workflow in a Course Management System*. Paper presented at the 36th SIGCSE technical symposium on Computer science education, St. Louis, Missouri, USA.
- Braverman, M. T., & Slater, J. K. (1996). *Advances in survey research*. San Francisco: Jossey-Bass Publishers.
- Burgess, D. T. F. (2001). *Guide to the Design of Questionarries*. Retrieved 11 September, 2004, from <http://www.leeds.ac.uk/iss/documentation/top/top2.pdf>
- Carnevale, A. P., & Carnevale, E. S. (1994). Growth Patterns in Workplace Training. *Training and Development*.
- Carter, K., MacLean, A., Lovstard, L., & Moran, T. (1990). *User-Tailorable Systems: Pressing the issues with Buttons*. Paper presented at the Computer Human Interaction.
- Constantine, L. L. (1995). *Constantine on Peopleware*: Prentice Hall.
- Dane, F. C. (1990). *Research Methods*: Brooks/Cole Publishing Company.
- eLearningPlace. (2004). *eLearning Place*. Retrieved 14 October, 2004, from www.elearningplace.co.uk
- Ferguson, N., Schmoller, S., & Smith, N. (2004). *Personalisation in presentation services*, from <http://www.therightplace.plus.com/jp/index.html>
- Fowler, F. J. (1993). *Survey Research Methods* (Second ed. Vol. 1): SAGE Publications.
- Fung, T. K. F. (2003, October 16-19). *Searching For Website Customization: An Adoption Of Educational Taxonomy For Conceptualization And Application*. Paper presented at the International and Interdisciplinary Conference of the Association of Internet Researchers, Toronto, Ontario, Canada.
- Gururajan, R. (2002). *A study of the influences of computer interfaces and training approaches on end user training outcomes*. Edith Cowan University.

- Hutchinson, & Sawyer. (1996). *Computers and information systems*. In (5th ed.): Chicago:Irwin.
- Hysell, D. (1998). *Meeting the Needs (and Preferences) of a Diverse World Wide Web Audience*. Paper presented at the Proceedings of the 16th annual international conference on Computer documentation.
- Kapp, C. M. (2002). *Implementation & Evolution of a Course Management System*. Paper presented at the 30th annual ACM SIGUCCS conference on User services, Providence, Rhode Island, USA.
- Kurman, J. (2004). Gender, Self-enhancement, and Self-Regulation of learning behaviours in Junior High School. *Academic Research Library*, 50(9/10), 11.
- Leventhal, L., Teasley, B., & Stone, D. (1994). *Designing for Diverse Users: Will Just a Better Interface Do?* Paper presented at the CHI '94 Celebrating Interdepend, Boston, Massachusetts USA.
- Lewis, E. T. (2000). *Interactive poster: Tech support engineers' communication in a chat tool*. Paper presented at the CHI '00 extended abstracts on Human factors in computing systems.
- Mathis, S. G. (2002). Improving First-Year Women Undergraduates' perception of their computer skills. *TechTrends*, 46(6).
- Mayer, R. E. (1981). The Psychology of How Novices Learn Computer Programming. *Computing Surveys*, 13(1), 120-141.
- McGrath, O. G. (2001, October 17-20). *Organizing New Interactions: Internet Portals in the Instructional Computer Lab*. Paper presented at the SIGUCCS, Portland Oregon, USA.
- Meinel, C., Sack, H., & Schillings, V. (2002). *Course Management in the Twinkle of an Eye — LCMS: A Professional Course Management System*. Paper presented at the 30th annual ACM SIGUCCS conference on User services, Providence, Rhode Island, USA.
- MicroAcademy. (1998). *Color Academy*. Retrieved 3 August, 2005, from <http://www.coloracademy.co.uk/Subjects/Psychology/Psycho.htm>
- Mock, K. (2001). The use of Internet Tools to Supplement Communication in the Classroom. *Journal of Computing Sciences in Colleges*, 17(2), 14-21.
- Morch, A. (1997). Three Levels of End-User Tailoring: Customization, Integration, and Extension. In M. Kyng & L. Mathiassen (Eds.), *Computers and Design in Context*: The MIT Press.
- Moreno-Munoz, A., Plaza-Alonso, A., de-Castro-Lozano, C., & Dormido-Bencomo, S. (2002). Hypermedia Design Methodology in World Wide Web Applications. *International Journal of Human Computer Interaction*, 14(2), 251.
- Myers, B. A. (1994). Challenges of HCI Design and Implementation. *Interactions*, 1(1).
- Myers, F. (2003). *Principles of Online Design: Information Presentation*. Retrieved 23 August, 2005, from <http://www.fgcu.edu/onlinedesign/mediadev.html>
- Nielsen, J. (1998). *Personalization is Over-Rated*. Retrieved 5 August, 2005, from <http://www.useit.com/alertbox/981004.html>
- Norman, D. A. (2002). Emotions and Design. *Interactions*, July & August.

- Norton, D. (2003). Rainbow Usability: Customization vs. Training in Developing Countries. *Interactions, March & April*.
- NCWC (2004). Sampling. Retrieved 26 Feb, 2006, from <http://faculty.ncwc.edu/toconnor/308/308lect03.htm>
- Oppenheim, A. N. (1966). *Questionnaire Design and Attitude Measurement*. London: Heinemann Educational Books.
- Raskin, J. (2000). *The Human Interface*: ACM Press.
- Ravden, S., & Johnson, G. (1989). *Evaluating Usability of Human-Computer Interfaces: A Practicle Method*: Ellis Horwood Limited.
- Reppel, A. (2003). *Personalization and the Power to Control*. Retrieved 5 August, 2005, from <http://reppel.co.uk/relationship-marketing/personalization-and-the-power-to-control.html>
- Result_Direct. (2003). *Association Technology Forum & Idea Exchange Web Customization: Giving Users What They Want*. Retrieved 26 August, 2004, from <http://www.resultsdirect.com/Files/PDFs/AssnTechForumHandouts1118031.pdf>
- Sasaki, H. (1991). *Color Psychology*. Retrieved 3 August, 2005, from <http://www.shibuya.com/garden/colorpsycho.html>
- Shneiderman, B. (2002, June). *Promoting universal usability with multi-layer interface design*. Paper presented at the 2003 conference on Universal usability, Issue 73-74.
- Shneidermun, B. (1995). Learner-Centered System Design: HCI Perspective for the Future.
- Stephanidis, C. (1999). Toward an Information Society for all: HCI challenges and R&D recommendations. *International Journal of Human-Computer Interaction*, 11(1), 1-28.
- Treiblmaier, H., Madlberger, M., Knotzer, N., & Pollach, I. (2004). *Evaluating Personalization and Customization from an Ethical Point of View: An Empirical Study*. Paper presented at the 37th Hawaii International Conference on System Sciences.
- Trochim, W. M. K. (2002). *Research Methods Knowledge Base*. Retrieved 16 January, 2005, from <http://www.socialresearchmethods.net/kb/>
- vanDam, F. (1990). *Computer Graphics: Principles and Practice 2nd Edition*.
- Waloszek, G. (2002). *Screen Layout – Part I*. Retrieved 23 August, 2005, from <http://www.sapdesignguild.org/community/design/layout1.asp>
- Wardell, B. (2002). *The Skinning Primer*. Retrieved 16 August, 2005, from <http://www.stardock.com/stardock/articles/skinprimer/skinprimer2002.html>
- WCET. (2005). *edu-tools: Compare by Features*. Retrieved 26 July, 2005, from <http://www.edutools.info/course/compare/byfeatures/index.jsp>
- Weisberg, H. F., & Bowen, B. D. (1997). *An introduction to survey research and data analysis*: W.H Freeman and Company.
- Wikipedia. (2005). *Human Computer Interaction*. Retrieved 05 August, 2005, from http://en.wikipedia.org/wiki/Human_computer_interaction
- Wolterstorff, E., Mattson, J., Tschofen, M., & Gieneart, L. L. (2004, April). *Design expo case studies: Flexible interface/application design for online awards*

catalog. Paper presented at the CHI '04 extended abstracts on Human factors in computing systems.

Wolz, U., Palme, J., Anderson, P., Chen, Z., Dunne, J., Karlsson, G., et al. (1997). *Computer-mediated communication in collaborative educational settings report of the ITiCSE '97 working group on CMC in collaborative educational settings.*

APPENDIX

Data Tables

Table 4-3: The number of participants in various demographic brackets

<i>Question</i>		<i>Results</i>					
i	Age	<u>17-19yrs</u>	<u>20-24yrs</u>	<u>25-29yrs</u>	<u>30yrs+</u>		
		13	38	13	21		
ii	Nationality	<u>Australian</u>	<u>Other English speaking Country</u>		<u>Non-English Country</u>		
		51	11		23		
iii	Gender	<u>Males</u>	<u>Females</u>				
		60	25				
iv	Level of Study	<u>1st year</u>	<u>2nd year</u>	<u>3rd year</u>	<u>4th year / Honours</u>	<u>GradDip/ Masters</u>	<u>PhD</u>
		17	21	27	6	8	5
v	Course	<u>Study of :</u>			<u>N^o</u>		
		Computer Science			36		
		Computer Security			6		
		Internet Computing			6		
		Software Engineering			11		
		Library technology			13		
		Communication and IT			10		
		Business			2		
		Digital Media			1		
vi	Mode of Study	<u>Internal</u>	<u>External</u>	<u>Online</u>			
		80	1	4			
vii	Enrolment type	<u>Full-time</u>	<u>Part-time</u>				
		59	26				

Table 4-13: Response to items presented in question 9 (%)

		<u>Category</u>	<u>SA</u>	<u>A</u>	<u>N</u>	<u>D</u>	<u>SD</u>
set my own colour scheme	Novice (N ^o = 19)		32	26	37	5	0
	Experienced (N ^o = 64)		8	39	39	8	3
	Female (N ^o = 25)		12	36	48	4	0
	Male (N ^o = 58)		14	38	36	9	3
set the background image of the page(s) I use	Novice (N ^o = 19)		11	42	37	11	0
	Experienced (N ^o = 64)		9	23	50	11	5
	Female (N ^o = 25)		8	32	52	8	0
	Male (N ^o = 58)		10	26	47	12	5
choose an interface 'theme' from a series of predefined templates	Novice (N ^o = 19)		37	42	11	11	0
	Experienced (N ^o = 64)		9	52	30	3	3
	Female (N ^o = 25)		16	48	36	0	0
	Male (N ^o = 58)		16	52	22	7	3
use icons for functionality and navigation	Novice (N ^o = 19)		16	63	11	11	0
	Experienced (N ^o = 64)		14	48	26	8	2
	Female (N ^o = 25)		12	64	16	8	0
	Male (N ^o = 58)		16	48	26	9	2
use text links for functionality and navigation	Novice (N ^o = 19)		16	42	37	5	0
	Experienced (N ^o = 63)		17	55	21	2	2
	Female (N ^o = 25)		24	48	28	0	0

	Male (N° = 57)	14	56	25	4	2
select a different screen layout	Novice (N° = 19)	32	58	5	5	0
	Experienced (N° = 64)	12	38	41	3	3
	Female (N° = 25)	8	60	28	4	0
	Male (N° = 58)	21	36	36	3	3

Table 4-16: Response to question 13 (%)

Q13. I would like the following features available to me

	<u>Category</u>	<u>SA</u>	<u>A</u>	<u>N</u>	<u>D</u>	<u>SD</u>
ability to set and receive assignment due date or other personal reminders	Novice (N° = 19)	58	42	0	0	0
	Experienced (N° = 65)	42	52	6	0	0
	Female (N° = 24)	50	42	8	0	0
	Male (N° = 60)	43	53	3	0	0
unit materials search function	Novice (N° = 19)	37	47	16	0	0
	Experienced (N° = 65)	37	49	9	0	5
	Female (N° = 25)	40	56	4	0	0
	Male (N° = 59)	36	46	14	0	5
unit notes update notification via email	Novice (N° = 19)	26	53	21	0	0
	Experienced (N° = 65)	38	43	14	3	2
	Female (N° = 25)	44	48	8	0	0
	Male (N° = 59)	32	44	19	3	2
a personal calendar & to-	Novice (N° = 19)	37	47	16	0	0

do-list	Experienced (N° = 65)	31	48	18	3	0
	Female (N° = 25)	40	32	24	4	0
	Male (N° = 59)	29	54	15	2	0
ability to see most recent postings on the message or forum discussion boards	Novice (N° = 19)	47	26	26	0	0
	Experienced (N° = 66)	33	41	21	3	2
	Female (N° = 25)	52	28	20	0	0
	Male (N° = 60)	30	42	23	3	2
unit materials in various formats e.g. textual, graphical or html	Novice (N° = 19)	32	53	16	0	0
	Experienced (N° = 65)	28	32	29	8	3
	Female (N° = 25)	20	52	24	4	0
	Male (N° = 59)	32	31	27	7	3
Website bookmarks	Novice (N° = 19)	16	53	26	5	0
	Experienced (N° = 65)	11	48	35	3	3
	Female (N° = 25)	20	48	32	0	0
	Male (N° = 59)	8	51	34	5	3
Recommendatio ns based on other peoples searches	Novice (N° = 19)	26	42	32	0	0
	Experienced (N° = 65)	18	36	36	6	3
	Female (N° = 25)	24	48	28	0	0
	Male (N° = 59)	19	34	39	7	3
Online notepad	Novice (N° = 19)	16	53	26	5	0

	Experienced (N° = 65)	14	39	33	8	5
	Female (N° = 25)	24	48	20	8	0
	Male (N° = 59)	10	41	37	7	5
Who's online indicator	Novice (N° = 19)	21	32	32	16	0
	Experienced (N° = 65)	17	39	33	5	5
	Female (N° = 25)	24	40	24	12	0
Personalised news feeds	Male (N° = 59)	15	37	37	5	5
	Novice (N° = 19)	5	26	63	0	5
	Experienced (N° = 65)	15	42	35	3	3
Live chat	Female (N° = 25)	16	28	44	8	4
	Male (N° = 59)	12	44	41	0	3
	Novice (N° = 19)	26	37	32	5	0
List or recently downloaded documents	Experienced (N° = 65)	17	30	38	9	3
	Female (N° = 25)	20	40	24	12	0
	Male (N° = 59)	19	29	42	7	3
ability to set the language display	Novice (N° = 19)	21	26	37	11	5
	Experienced (N° = 65)	14	36	35	11	5
	Female (N° = 25)	20	40	36	4	0
	Male (N° = 59)	14	32	36	14	7

language display	Experienced (N° = 65)	6	11	66	14	3
	Female (N° = 25)	12	16	68	4	0
	Male (N° = 59)	7	12	64	14	3
