

## Factors Affecting Faculty Web Portal Usability

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### ABSTRACT

The study investigated the factors that might significantly affect web portal usability. Results of the study were intended to serve as inputs for faculty web portal development of the University of the East-Manila. Descriptive statistics utilized questionnaire data from 82 faculty members. The data showed that most of the respondents were relatively young, were Master's degree holders, were skilled in using the computer and the internet, had internet access at home, and were committed to using the web portal. Respondents perceived that the different web portal design-related factors were moderately evident in the existing faculty web portal. Multiple regression analysis showed that information content as a web portal design-related factor was the only significant predictor of web portal usability. Thus, the null hypothesis stating that faculty-related and web portal design-related factors do not significantly affect faculty web portal usability is accepted except Information Content. The study also discussed the guidelines for web portal developers, as well as the limitations and implications of the study for future research.

### Keywords

Information content, Web portal design, Web portal usability, UE portal, Usability

### Introduction

One of the features of the web is a web portal. A portal, in general, is a gateway to information and services from multiple sources (Tatnall, 2005 cited in Manouselis et al., 2009) that facilitate users' access to the content in one or more learning repositories (Holden, 2003 cited in Manouselis et al., 2009). It has a database that helps users store, locate, and retrieve learning resources (Holden, 2003 cited in Manouselis et al., 2009) in an easy centralized access to all relevant network content and applications (Tatnall & Davey, 2007 cited in Tatnall, 2009). Since the introduction of web portal concept from search engine sites such as Yahoo!, Excite, and Lycos (Tatnall, 2005 cited in Tatnall, 2009), "portals have now become an extremely important aspect of the Web and are now quite ubiquitous" (Tatnall, 2009, p. 1). In fact, Bricolo et al. (2007) found out that web portals are the most visited site among Italian families.

As technology becomes a key tool for good teaching (Adonis, 2006), academic institutions promote and encourage optimization of the Internet technology for information dissemination. The web is becoming an educational medium for universities (Manouselis et al., 2009). Higher education institutions have developed their own web portals because "universities wish to project the impression that they offer the most convenient service and excel in the field of Information Technology—this allows them to attract superior students" (Lee et al., 2009, p. 2). Manouselis et al. (2009) called it educational web portal. This serves as a gateway to information and services of some learning or teaching relevance (Manouselis et al., 2009).

The University of the East (UE) in Manila is one of the universities that recognize the power of the Internet. It continuously uses its financial resources to "connect" to the rest of the world and to support online learning. To realize these goals, UE developed its website and faculty web portal (Figures 1 and 2). In the convenience of their own homes, students and teachers can communicate undisrupted (Figure 2-f). Teachers can post lectures, notes, seat works, assignments, and even quizzes in advance (Figure 2-e).

Students can download these files and be kept informed of the lessons. Teachers can view their academic profile (Figure 2-a), know their teaching load for the current semester (Figure 2-b), and download class lists to verify students' inclusion in the class (Figure 2-c). They can research online through its e-journals and other scholarly works (Figure 2-d). They can post the grades of the students so that they will know their class standing (Figure 2-e). Hence, a faculty web has been an access point for the diverse faculty-related undertakings that include reviewing literature, faculty-student instructional transactions, blogging, student-teacher evaluation, and record keeping.

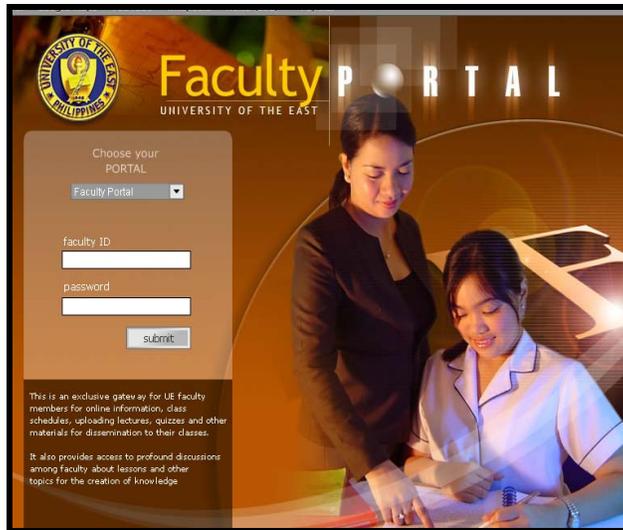


Figure 1. The UE Faculty Web Portal Log-in Form

Development and maintenance of a web portal is expensive and time-consuming. Therefore, it is imperative that the web portal be designed accordingly to achieve its optimum use. The faculty portal section in the UE website was designed with elements for academic transactions (class list downloads, lecture uploads, student-teacher forums, and evaluation results) and online research (e-journals, e-books, articles, and case studies). However, despite the elements supplied in the design, there is still a need to study the factors that significantly affect the web portal usability. There is a wealth of literature discussing website usability (e.g., Palmer, 2002; Tarafdar & Zhang, 2005; Cappel & Huang, 2007; Pearson & Pearson, 2008; Pang et al., 2009) but very few studies have been conducted to investigate web portal usability.



Figure 2. UE Faculty Web Portal Main Page

This study was conceived to address this gap. Specifically, it aimed to answer the following questions. (1) What are the faculty-related factors in terms of age, highest educational attainment, level of computer applications and Internet skills, commitment of use of faculty web portal, and presence of internet access at home? (2) How evident are the web portal design-related factors, such as ease of navigation, information content, availability, speed, and aesthetics, in the existing faculty web portal? (3) What is the level of usability of the web portal elements (academic

transactions and online research) as to frequency of use? and (4) Do the faculty-related factors and web-portal design-related factors, singly or in combination, affect the faculty web portal usability?

## Literature review

Different studies have used the term *usability* in varied ways, thus making it a very confusing concept (Green & Pearson, 2006). There is also no common agreement on a definition of usability (Sindhuja & Dastidar, 2009). Nevertheless, Pressman (2001) attempted to define usability as an attempt to quantify user-friendliness yielding measurable attributes of the users, like (a) skills, both physical and/or intellectual, necessary to learn the system, (b) time required to become efficient in the use of the system, (c) increase in productivity by users who are efficient in utilizing the system, and (d) subjective evaluation of users' attitude towards the system. Usability can also be defined as "the measure of the quality of a user's experience when interacting with a product or system — whether a Website, a software application, mobile technology, or any user-operated device" (Usability.gov, n.d.).

Usability is an important concept in systems development because it is equated to financial gain or loss. Systems with poor usability due to poor website design result in negative financial impacts (Tarafdar & Zhang, 2005). If a website is not usable many users will simply access another site that can meet their needs (Cappel & Huang, 2007). Customers most probably switch to the competitor's sites (Cappel & Huang, 2007).

Landauer (1996 cited in Tarafdar & Zhang, 2005) said that the U. S. economy loses \$30 billion every year in lost productivity due to insufficient use of usability engineering methods in system and website development. Poor website usability costs e-retailers approximately \$4 billion loss in revenue, since many prospective customers do not complete the transactions that they have started. This is a big financial loss to organizations since they are investing millions of dollars in internal and external websites (Pearson & Pearson, 2008).

On the other hand, a usable website that supports customers is associated with higher firm performance (Saeed et al., 2002/3 cited in Pang et al., 2009), increased sales, higher levels of website traffic, improved user performance, increased use of specific features (Nielsen, 2000 cited in Pearson & Pearson, 2008), positive attitude toward online stores, increased stickiness and revisit rates, and stimulated online purchases (Green & Pearson, 2006). However, "despite advancements in technology and significant investments, it is commonly observed that web services implementing business processes have low usability" (Geczy et al., 2011, p. 131). This can be attributed from misalignment between natural characteristics of human interactions in the digital environments and their design and implementation (Geczy et al., 2011).

Numerous research articles attempted to address this problem. Preece et al. (2002) advocated the following design principles to achieve high usability: (a) visibility of system status, match between system and real world, user control and freedom, (b) consistency and standards, (c) user support to recognize, diagnose and recover from errors, (d) error prevention, (e) recognition rather than recall, (f) flexibility and efficiency of use, (g) aesthetic and minimalist design, and (h) help and documentation.

Pearson & Pearson (2008) found out that ease of navigation is a critical component of website usability. Ease of navigation refers to "ease of finding what one desires and knowing where one is in the website" (Sindhuja & Dastidar, 2009, p. 58). It influences website usability (Tarafdar & Zhang, 2005). Ruffini (2001), Palmer (2002), Becker (2005), Seethamraju (2006), Tarafdar & Zhang (2007), Sindhuja & Dastidar (2009), and Zaharias & Poylymenakou (2009) also support this factor. Thus, websites can be improved with regard to navigation (Cappel & Huang, 2007).

Palmer (2002) found out that information content is associated with successful websites. Sindhuja & Dastidar (2009) also found out that information content has significance in the web context because a useful website gives a business-to-consumer (B2C) company a competitive advantage (Pearson & Pearson, 2008). Shneiderman (2005 cited in Pearson & Pearson, 2008) emphasized that website designers must go beyond user friendliness. Website designers should understand the needs of the users. The content of the website should deliver quality information to the users (Cooke, 2003). In other words, designers should look into the relevance (Pearson & Pearson, 2008), depth and breadth (Ruffini, 2001), accuracy (Seethamraju, 2006; Sindhuja & Dastidar, 2009), concurrency (Seethamraju,

2006), and consistency (Sindhuja & Dastidar, 2009) of the information of a website. These ensure the good performance (Tarafdar & Zhang, 2007) and high usability (Tarafdar & Zhang, 2005) of a website.

A regular and consistently available website is one of the factors of a successful website (Tarafdar & Zhang, 2005). If a website is not available, then it cannot be used. If it cannot be used, then customers cannot conduct a transaction (Pearson & Pearson, 2008). Failure to transact greatly affects the performance of a website (Tarafdar & Zhang, 2007). It can be noted that customers perceive the quality of a web by its availability (Seethamraju, 2006). Thus, availability also influences the usability of a website (Tarafdar & Zhang, 2005).

Users feel anxious and lose satisfaction with the website if there is a prolonged delay to access online information (Tarafdar and Zhang, 2005). Nielsen (2000 cited in Pearson and Pearson, 2008) advocated that speed should be considered in designing a website since users' attention diminishes if they will be waiting for more than 10 seconds. Thus, it was perceived as a factor of a quality website (Seethamraju, 2006) and it came out as a predictor of website usability (Tarafdar & Zhang, 2005).

Aesthetics is one of the design criteria in assessing a product (Flowers, 2005) and no business wants to be associated with dull and uninspiring designs (Blunden, 2003). Ruffini (2001) argued that the design of information, selection of graphics, and visual elements (that include color, text, and graphics) are directly related to the intended user. Cyr et al. (2009) found out that aesthetics was considered in a website design. Similarly, Brady & Phillips (2003) found out that an aesthetically pleasing site ranked the highest when the subject users were asked to predict which would be the easiest to use. It is interesting to note that majority of the subject users commented that color was a factor in ranking aesthetic appeal.

Moreover, some studies showed that web aesthetics had positive effects on activation of search on a website and on the intention to purchase on an online store (Wang et al., 2010). Banati et al. (2006) also found out that aesthetics contributed to improving the usability of the site. Becker (2005), Sindhuja & Dastidar (2009), and Zaharias & Poylymenakou (2009) also used this construct.

Different studies also showed that user characteristics can influence the usability of a website. Banati et al. (2005) argued that age could affect the usability of a website. For instance, Milne et al. (2005) said that older people were at risk of being digitally excluded since web content was inappropriately designed with age-related impairments. Milne et al. (2005) further said that the contents of the website were commonly aimed for youth who were technologically adept and familiar with Internet conventions. Mead et al. (2000) also disclosed that older computer users had lower library database search performance than younger adults with similar computer experience. In addition, Becker (2005) revealed that older people were encountering usability problems on e-government sites.

Milne et al. (2005, p. 560) attributed this to age since "the cluttering of small, difficult-to-identify items can make the fairly ubiquitous task of 'pointing and clicking' excessively demanding for many older people; that is, precise manual dexterity becomes more difficult with advanced age, particularly when motion is indirectly mapped from the mouse onto the screen." Sun et al. (2005) confirmed this as they found out that age was a significant predictor of Internet use. More precisely, increased age was associated with less website experience (Laberger & Scialfa, 2005).

Milne et al. (2005) also said that uneducated users were at risk of being excluded as Internet users. As a result, website developers are advised to know the characteristics of the target audience such as their educational background (Ruffini, 2001). Meanwhile, effective design is not absolute since it depends on the skills of individual users (Sandvig & Bajwa, 2004). It is also important to know the user's skills and experiences in using a computer and the Internet. Zhang et al. (2006) found out that the user's skills and experiences were correlated with the user's e-service satisfaction. They also affected the user satisfaction and the intention to use a website. Computer self-efficacy, as Pearson & Pearson (2008) called it, is the ability of an individual to use a computer. It is said that skilled users can perform the necessary work more effectively (Lee, 2008 cited in Lee et al., 2009).

Commitment to a website is the user's intention to continue using the website in the future (Casalo et al., 2007). Hence, a skilled user who is not committed to use a website may result into low website usability. Conversely, a user who is committed to use a website is found to stick (repetitive visits to and use of a preferred website consistently in the future) in using a website (Li et al., 2006).

Finally, in the study of Bricolo et al. (2007) on the home Internet usage among the Italian families, web portals were the most visited site. Rieh (2004, p. 743) explained this finding since “as more people gain at-home access to the Internet, information seeking on the Web has become embedded in everyday life.” Thus, Internet access at home can be an influencing factor of website usability.

## **Research Paradigm**

The foregoing literature review served as basis in formulating the research paradigm shown in Figure 3. The study proposed that the web portal usability could be influenced by (1) faculty-related factors and (2) web portal design-related factors. These factors were regressed, singly and in combination, with the dependent variable (Faculty Web Portal Usability) to determine whether the independent variables could affect the usability of the web portal.

Respondents were asked to rate their level of computer applications and Internet skills. These skills were needed to use the web portal successfully. There were 20 questions on this construct. Respondents were also asked to rate their commitment to the use (i.e., their long-term willingness in using the web portal) of the faculty web portal. The study also aimed at finding out whether respondents had Internet access at home.

Web portal design-related factors made up the second set of constructs. These were subdivided further into five (5) categories with the following definitions.

- Ease of navigation refers to the web portal design characteristic that ensures user’s clear understanding of the web portal structure. It allows the user to move easily from section of the portal to another.
- Information content is the web portal attribute pertaining to the relevancy, amount, and usefulness of information found in the web portal. It also refers to the mechanisms on how contents are disseminated.
- Availability depicts the duration of time as dictated by the system administrator or website owner that determines when a web portal is available to the user for access.
- Speed is the response time of the web server of the web portal on the different user’s activities.
- Aesthetics is the general look of the web portal. It includes various design attributes such as color, web pages layout, font styles and sizes, and general appearance.

Moreover, the independent variable (Faculty Web Portal Usability) was measured in terms of frequency of use (e.g., Palmer, 2002). It was divided further into academic transactions and online research.

## **Hypothesis**

In accordance with the research paradigm (Figure 3), the null hypothesis given below was tested using statistical tools.

H<sub>0</sub>: Faculty-related and Web portal design-related factors do not significantly affect faculty web portal usability.

## **Data and Methodology**

### **Research Design, Locale, Subjects, Sampling Design and Procedure**

This descriptive study was conducted using self-administered questionnaire on faculty members who were selected through random sampling. Using the Sloven’s formula with a sampling error computed at 0.10, the minimum sample size of 80 was derived from the 400 faculty members employed at the University of the East-Manila during the First Semester of School Year 2007-2008. Sample size was increased by 37.5% to accommodate potential low completion rate.

Letters of request were sent to the five colleges of the University. All colleges participated in the survey. Twenty (20) survey questionnaires were distributed to each of the six (6) colleges of UE-Manila except College of Law with ten (10). Eighty-two (82) forms were retrieved and these were all used.

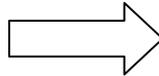
## Independent Variables

Faculty-Related Factors

- Age
- Highest Educational Attainment
- Level of Computer Applications and Internet Skills
- Commitment to the Use of Faculty Web Portal
- Presence of Internet Access at home

Web Portal Design-Related Factors

- Ease of Navigation
- Information Content
- Availability
- Speed
- Aesthetics



## Dependent Variable

Faculty Web Portal Usability

Frequency of use

- a. academic transactions
  - class list download
  - lecture upload
  - student-teacher forums
  - evaluation results
- b. online research
  - e-journals
  - books
  - articles
  - case studies

Figure 3. The Research Paradigm Showing the Factors That Might Affect the Faculty Web Portal Usability

## Research Instrument

Three experts validated the content of the questionnaire. Questionnaire pre-testing was conducted on 30 faculty members of the College of Computer Studies and Systems. They were selected in the questionnaire pre-testing because of their familiarity with the UE web portal. Modifications (e.g., inclusion and/or exclusion of confusing, leading, or irrelevant questions) were done based on three experts' recommendations and on the results of pre-testing. After these modifications, the questionnaires were distributed to the faculty members of the six colleges of the University.

Faculty-related factors were composed of age, educational attainment, availability of internet access at home, level of computer applications and internet skills and commitment to the use of faculty web portal. Levels of computer applications and internet skills were measured using a 5-point scale ranging from "highly skilled" (5) to "not skilled" (1) (See Table 1) while commitment to the use of the faculty web portal was measured using a 5-point scale ranging from "highly committed" (5) to "not committed" (1) (See Table 1).

LECTURE NAME	LECTURE DESCRIPTION	OPTION
<b>SECOND SEMESTER S.Y. 2005 2006</b>		
Graph Coloring Uploaded: Mar 09 2006 09:20PM	Graph Coloring in DMATH Filename: GRAPH COLORING - lecture.doc	[Edit] [Del] [View]
Prims Algorithm Uploaded: Mar 09 2006 09:23PM	Finding the Minimum Spanning Tree Filename: Prims Algorithm.doc	[Edit] [Del] [View]
<b>FIRST SEMESTER S.Y. 2007 2008</b>		
Arrays, Pointers and Structures Uploaded: Aug 15 2007 10:39PM	Hand-outs in arrays, pointers and structures for DSALG Filename: Arrays, Structures and Pointers.doc	[Edit] [Del] [View]
Arrays, Pointers, and Structures Uploaded: Aug 15 2007 10:37PM	Download these files. Filename: Arrays, Pointers, and Structures.ppt	[Edit] [Del] [View]
Combinatorics Uploaded: Jul 31 2007 11:56PM	Lecture Filename: COMBINATORICS - lecture.doc	[Edit] [Del] [View]

(a)

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Find: portal usability

AND Select a Field (optional)

AND Select a Field (optional)

AND Select a Field (optional)

in: Additional Databases

(Searching: Business Source Complete)

Search Clear Search Tips

Limit results to: Full Text

(b)

Figure 4. Sample Webpage Facilitating (a) Academic Transaction and (b) Online Research

The web portal design-related factors, which dwelt on the perception of the respondents on how the features of the portal were appropriately designed for academic transactions (Figure 4-a) and online research (Figure 4-b), were likewise evaluated using a 5-point scale ranging from “highly evident” (5) to “not evident” (1) (See Table 1).

The frequency of weekly access was measured through a 5-point scale ranging from “very often” (5) to “never” (1) (See Table 1).

Table 1. The 5-Point Scale and Its Verbal Interpretation and Mean Range

Verbal Interpretation	Weight	Mean Range
Highly (skilled/committed/evident) / Very Often	5	4.51 – 5.00
Skilled/Committed/Evident / Often	4	3.51 – 4.50
Moderately (skilled/committed/evident) / Sometimes	3	2.51 – 3.50
Slightly (skilled/committed/evident) / Seldom	2	1.51 – 2.50
Not (skilled/committed/evident) / Never	1	1.00 – 1.50

Factor analysis and Cronbach’s alpha was used to determine the validity and reliability of the constructs, respectively. All constructs (See Table 2) were found to be valid (factor loading greater than 0.50) and reliable (above the minimum criterion of 0.70) (Pallant, 2001; George & Mallery, 2009).

Table 2. Validity and Reliability of Constructs

Constructs	Number of questions	Factor loadings	Cronbach’s alpha
Ease of Navigation	5	0.814	0.967
Information Content	5	0.883	0.891
Availability	5	0.847	0.923
Speed	5	0.838	0.965
Aesthetics	5	0.840	0.963
Academic Transactions	4	0.931	0.872
Online Research	4	0.931	0.963

Frequency counts, percentages, and mean were used to describe the respondents and their responses statistically. Multiple regression analysis at 1% level of probability and 99% reliability was used to determine which of the faculty- and web portal design-related factors would significantly affect the usability of faculty web portal.

## Results, Analysis and Evaluation

### The Faculty-Related Factors

As seen in Table 3, most of the respondents were relatively young, were Master’s degree holders, were committed to the use of the faculty web portal, and had Internet access at home. It also shows that respondents were skilled in using different computer applications and the Internet (e.g., starting up, rebooting, and shutting down a computer, creating/deleting/renaming a file, downloading and uploading files, searching e-journals, etc.). The alpha value of this construct is 0.985.

Table 3. Summary of Findings on Faculty-Related Factors

Faculty-Related Factors	Findings
Age	Most of the respondents were in the age bracket of 30–39 ( $f=34$ , 41%).
Highest Educational Attainment	Most of the respondents attained master’s degree ( $f=54$ , 66%).
Level of Computer Applications and Internet Skills	Respondents are <i>skilled</i> in using different computer applications and the Internet (mean = 4.14).
Commitment to the Use of Faculty Web Portal	Respondents were committed (mean = 3.61) to the use of the faculty web portal.
Presence of Internet Access at Home	Sixty-six percent ( $f=54$ , 66%) of the respondents had internet access at home.

Meanwhile, as shown in Table 4, Availability got the lowest mean rating of 3.01 (moderately evident). Aesthetics got the highest mean rating of 3.73 (evident). The overall perception of the respondents yielded to 3.30 (moderately evident). This shows that faculty web portal with respect to design, content structure, and organization is moderately acceptable to the respondents.

However, respondents perceived that the design of the faculty web portal in accordance with the web the different web portal-related factors as moderately evident (grand mean = 3.30). According to Tarafdar & Zhang (2007), design factors, such as ease of navigation, information content, speed, and availability are characteristics of a website that highly influence usability. Unfortunately, these are perceived to be moderately evident. Follow-up questions showed that this is mainly because (a) respondents encounter dead links – links that do not function while surfing the web portal, (b) the portal moderately support downloading and uploading mechanisms of seat works, assignments, quizzes, etc., (c) electronic copies of research, thesis, and dissertations are not available online, and (d) no chatting facility.

*Table 4. Mean Level of Consideration of the Respondents on the Faculty Web Portal as to Different Web Portal Design-Related Factors*

<b>Web Portal Design-Related Factors</b>	<b>Mean</b>	<b>Verbal Interpretation</b>
Ease of Navigation	3.32	Moderately Evident
Information Content	3.35	Moderately Evident
Availability	3.01	Moderately Evident
Speed	3.10	Moderately Evident
Aesthetics	3.73	Evident
<b>Grand Mean</b>	<b>3.30</b>	<b>Moderately Evident</b>

Table 5 shows that faculty respondents only use the faculty web portal from time to time (grand mean = 2.74, Sometimes).

*Table 5. Frequency of Use as to Academic Transactions*

<b>Academic Transactions</b>	<b>Mean</b>	<b>Verbal Interpretation</b>
Downloading of Class List	3.00	Sometimes
Uploading of Lecture Materials	2.57	Sometimes
Student-Teacher Forums	2.39	Seldom
Evaluation Results	3.00	Sometimes
<b>Grand Mean</b>	<b>2.74</b>	<b>Sometimes</b>

Student-Teacher Forums yielded the lowest score of 2.39 (Seldom) while Downloading of Class List and Viewing of Evaluation Results got the highest scores of 3.00 (Sometimes). Faculty respondents use the faculty web portal only from time to time (grand mean = 2.74).

These findings can be attributed to the following reasons. (1) Respective Colleges give class lists to the faculty members and the faculty do not see the need to download the class lists, or if they do download the class lists, they just need to acquire a softcopy once. (2) Student evaluation is conducted once every semester. Therefore, viewing its results could happen at the later part of the semester. (3) Uploading of files through the web portal is only limited to one megabyte and limited only to a specific type of files (e.g., spreadsheet and PDF documents cannot be uploaded). (4) The nature of the present items of the portal does not require to be accessed on a daily basis, e.g., viewing of evaluation results and downloading of class lists. (5) There is lack of specific policy regarding the use of the portal. It can be noted that there is no University-wide existing policy regarding the use of faculty web portal.

Meanwhile, from Table 6, all online research materials were only used sometimes (grand mean = 2.72). The low usability of online research cannot be attributed to traditional research in the library. Library usage statistics showed that during the school years 2005-2006, 2006-2007, and 2007-2008, the daily average number of faculty who visits the library was only 15, 12, and 12, respectively.

Table 6. Frequency of Use as to Online Research

Online Transactions	Mean	Verbal Interpretation
Electronic Journals	2.71	Sometimes
Books	2.70	Sometimes
Articles	2.78	Sometimes
Case Studies	2.70	Sometimes
<b>Grand Mean</b>	<b>2.72</b>	<b>Sometimes</b>

It can be noted that even though faculty-respondents are skilled in performing various computer- and Internet-related activities, have a high sense of commitment to the use of the faculty web portal, and have internet connection at home (Table 3), the faculty web portal is still not used frequently. The faculty web portal log shows that out of 695 faculty members, only 12 (2%) logged on to the portal for January, 2008, 19 (3%) logged on February, 39 (6%) logged on March, 87 (12%) logged on June, 120 (17%) logged on July, and 55 (8%) for the first week of August.

### Factors That Affect Faculty Web Portal Usability

Table 8 shows the stepwise regression of faculty web portal usability on faculty-related and web portal design-related factors. Only information content was found to be a significant predictor (beta = 0.57;  $p$ -value = 0.000) of faculty web portal usability. The adjusted  $R^2$  shows that 31% (Adjusted  $R^2 = 0.31$ ) in the variation in usability of the faculty web portal was accounted to information content. The prediction was unlikely to have arisen from sampling error ( $F$ -value = 37.66,  $p$ -value < 0.01).

Table 8. Regression of Faculty Web Portal Usability on Faculty-Related and Web Portal Design-Related Factors

Predictor	Adjusted $R^2$	$F$ -value	Beta	$p$ -value
<b>Information Content*</b>	0.31	37.66	0.57	0.000

\* $p$ -value < 0.01 level of significance

The result agreed with the study of Tarafdar & Zhang (2005) that information content influences web usability. It also supported the studies of Ruffini (2001), Palmer (2002), Seethamraju (2006), Tarafdar & Zhang (2007), Pearson & Pearson (2008), and Sindhuja & Dastidar (2009). It can be noted that information content refers to the website attribute pertaining to the variety, amount, quality, and usefulness of information found in the website, as well as various mechanisms on how information may be conveyed from one type of use to another. This is the main objective of the faculty web portal. Ensuring the comprehensiveness of the content of the web portal will help further realize the objectives of the web portal. This implies that in evaluating the effectiveness of a web portal, the questionnaire should surface the rich information content of a web portal.

### Implications for Web Portal Developers

The finding shown in Table 8 implies that web portal programmers should develop a web portal based on the needs of the users. During the development phase of the web portal, direct users should be involved in the development to ensure that the elements in the portal are really needed. Banati et al. (2005) said that different stakeholders influenced website usability. Among these stakeholders are the actual users.

Users are viewed as important sources of knowledge (Axtell et al., 1997 cited in Sugar, 2001) in the development of the system. Thus, actual interviews, not intellectual guesses, should be deployed to direct users to ascertain their needs. This participatory design in the development of computer systems needs full participation from the users (Greenbaum & Kyng, 1991 cited in Sugar, 2001) since it can avoid confusion or irritation of the user (Sandvig & Bajwa, 2004). Knowing the target users (Ruffini, 2001; Flowers, 2005) and their needs can be done through focus group interview. This is found to be a very efficient and effective approach in designing a website (Choe et al., 2006).

For examples, Abdous (2005), in an attempt to achieve higher educational impact of the web portal, included faculty-centered tools such as syllabus generator and curriculum mapping tool. Gallant et al. (2007) employed participatory

design methods in the development of hospital websites. Wegener et al. (2004) designed a website for a library by putting themselves in their students' shoes. In this manner, if web developers supplied contents relevant to the users during the portal development, then it can be expected that the web portal will be highly usable.

## Conclusion and Recommendations

The results of the study show that among all the factors studied, only information content of the web portal design-related factors significantly affected faculty web portal usability. Thus, the null hypothesis stating that faculty-related and web portal design-related factors do not significantly affect faculty web portal usability is accepted except Information Content.

This study is considered to be a pioneering study in web portal usability in the Philippines. However, there are lots of gap in the literature to fill in. In the light of the limitations, findings, and conclusion presented, the following recommendations are set forth.

- The information content of faculty web portal can be enhanced. Include chatting capabilities, faculty e-mail query, researchers' hub, or online book reservations. Involve faculty members in the development of the web portal. In other words, know the target users (Ruffini, 2001).
- Factors other than those studied here can be included such as ease of use (Hart et al., 2008; Ryan & Rao, 2008; Aljukhadar & Senecal, 2009), retention (Rodgers & Negash, 2007) and attitude (Aljukhadar & Senecal, 2009) towards using the web portal. Since humans dealt with a computer system, human factors, such as those stated earlier, might have effect on web portal usability. Also, instead of self-rated frequency of use, actual number of hours of use as indicator of frequency of use can also be utilized as the independent variable.
- Further investigation can be conducted to find out the causes of low usability of faculty web portal usability in spite of committed, internet-connected, and skilled faculty members. Thus, in accordance with the previous recommendation, qualitative-quantitative techniques can be utilized to investigate this.
- Further studies can investigate the usability of the web portal in two poles: one at the side of the faculty and the other at the side of the students. Usability of the two web portals can only be realized if the elements of the two web portals match.
- Though the study found out that respondents were not novice computer and Internet users, it is not clear whether they were novice web portal users. User experience categorized as novice, expert and professional can influence website usability (Banati et al., 2005).
- Proper training or orientation on the use of the faculty web portal should be conducted. Formulate the institutional policy on the use of the web portal. This could address the issue of novice users.
- User satisfaction as a measure of usability can also be investigated. This is necessary since user satisfaction guides the viewpoint of a user towards a website and hence its usage (Banati et al., 2006). Palmer (2002) and Abdinnour-Helm et al. (2005) used satisfaction as a measure of the performance of a website.
- This study did not deal on the usefulness and effectiveness of the web portal. Hence, usefulness of the portal based on its purpose (Ruffini, 2001) and its effectiveness (Tatnall, 2009) can be conducted.
- Lastly, an investigation of its reasons of adoption (or non-adoption), advantages and problems associated with its use (Tatnall, 2009) can also be initiated.

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## References

Abdinnour-Helm, S. F., Chaparro, B. S., & Farmer, S. M. (2005). Using the end-user computing satisfaction (EUCS) instrument to measure satisfaction with a web site. *Decision Sciences*, 36(2), 341–364.

- Abdous, M. (2005). Designing a faculty portal framework and architecture. In *21<sup>st</sup> Annual Conference on Distance Teaching and Learning*. Retrieved October 17, 2008, from <http://www.uwex.edu/disted/conference>.
- Adonis, L. A. (2006). Technology in schools. *Manager: British Journal of Administrative Management*, *52*, 14–15.
- Aljukhadar, M., & Senecal, S. (2009). How the website usability elements impact performance. *Value Creation in E-Business Management*, *36*(2), 113–130.
- Banati, H., Bedi, P., & Grover, P.S. (2006). Evaluating web usability from the user's perspective. *Journal of Computer Science*, *2*(4), 314–316.
- Becker, S.A. (2005). E-government usability for older adults. *Communications of the ACM*, *48*(2), 102–104.
- Blunden, P. (2003). Why usability matters. *New Media Age, Centaur Communications Limited*. Retrieved December 19, 2010, from <http://www.highbeam.com/doc/1G1-105085336.html>.
- Brady, L., & Phillips, C. (2003). *Aesthetics and usability: A look at color and balance*. *Usability News*, *5*(1). Retrieved October 17, 2007, from <http://www.surl.org/usabilitynews/51/pdf/Usability%20News%2051%20-%20Brady.pdf>.
- Bricolo, F., Gentile, D. A., Smelser, R. L., & Serpelloni, G. (2007). Use of the computer and Internet among Italian families: First national study. *CyberPsychology & Behavior*, *10*(6), 789–797.
- Cappel, J., & Huang, Z. (2007). A usability analysis of company websites. *The Journal of Computer Information Systems*, *48*(1), 117–123.
- Casalo, L., Flavia'n, C., & Guinali'u, M. (2007). The influence of satisfaction, perceived reputation and trust on a consumer's commitment to a website. *Journal of Marketing Communications*, *13*(1), 1–17.
- Choe, P., Kim, C., Lehto, M. R., Lehto, X., & Allebach, J. (2006). Evaluating and improving a self-help technical support web site: Use of focus group interviews. *International Journal of Human-Computer Interaction*, *21*(33), 333–354.
- Cooke, M. (2003). Why real people are vital to good usability. (Analyst Speak). *New Media Age, Centaur Communications Limited*. Retrieved February 15, 2011, from <http://www.highbeam.com/doc/1G1-105366024.html>.
- Cyr, D., Head, M., Larios, H., & Pan, B. (2009). Exploring human images in website design: A multi-method approach. *MIS Quarterly*, *33*(3), 539–566.
- Flowers, J. (2005). Usability testing in technology education. *The Technology Teacher, International Technology Education Association*. Retrieved December 19, 2010, from <http://www.highbeam.com/doc/1G1-133139184.html>.
- Gallant, L., Irizarry, C., & Kreps, G. L. (2007). User-centric hospital web sites: A case of trust and personalization. *e-Service Journal*, *5*(2), 5–26.
- Geczy, P., Izumi, N., & Hasida, K. (2011). Foundations for effective portal service management. *Global Journal of Business Research*, *5*(2), 131–141.
- George, D., & Mallery, P. (2009). *SPSS for Windows step by step: A simple guide and reference 16.0 update* (9<sup>th</sup> Ed.). Boston: Pearson Education.
- Green, D., & Pearson, J. M. (2006). Development of a web site usability instrument based on ISO 9241-11. *The Journal of Computer Information System*, *47*(1), 66–72.
- Hart, T. A., Chaparro, B. S., & Halcomb, C. G. (2008). Evaluating websites for older adults: Adherence to 'senior-friendly' guidelines and end-user performance. *Behaviour & Information Technology*, *27*(3), 191–199.
- Laberge, J. C., & Scialfa, C. T. (2005). Predictors of web navigation performance in a life span sample of adults. *Human Factors*, *47*(2), 289–302.
- Lee, H. S., Choi, Y. H., & Jo, N. O. (2009). Determinants affecting user satisfaction with campus portal services in Korea. *Journal of Internet Banking and Commerce*, *14*(1), 1–18.
- Li, D., Browne, G. & Wetherbe, J. (2006). Why do internet users stick with a specific web site? A relationship perspective. *International Journal of Electronic Commerce*, *10*(4), 105–141.
- Manouselis, N., Kastrantas, K., Sanchez-Alonzo, S., Caceres, J., Ebner, H., Palmer, M., & Naeve, A. (2009). Architecture of the Organic.Edunet web portal. *International Journal of Web Portals*, *1*(1), 71–91.
- Mead, S. E., Sit, R. A., Rogers, W. A., Jamieson, B. A., & Rousseau, G. K. (2000). Influences of general computer experience and age on library database search performance. *Behavior & Information Technology*, *19*(2), 107–123.
- Milne, S., Dickinson, A., Carmichael, A., Sloan, D., Eisma, R., & Gregor, P. (2005). Are guidelines enough? An introduction to designing web sites accessible to older people, *IBM Systems Journal*, *44*(3), 557–571.
- Pallant J. (2001). *SPSS survival manual: A step by step guide to data analysis using SPSS for Windows version 10*. Buckingham: Open University Press.
- Palmer, J. W. (2002). Web site usability, design, and performance metrics. *Information Systems Research*, *13*(2), 151–167.
- Pang, M.-S., Suh, W., Kim, J., & Lee, H. (2009). A benchmarking-based requirement analysis methodology for improving web sites. *International journal of Electronic Commerce*, *13*(3), 119–162.

- Pearson, J. M., & Pearson, A. (2008). An exploratory study into determining the relative importance of key criteria in web usability: A multi-criteria approach. *The Journal of Computer Information Systems*, 48(4), 115–127.
- Preece, J., Rogers, Y., & Sharp M. (2002). *Interaction design, beyond human – computer interaction*. New York: John Wiley & Sons.
- Pressman, R. (2001). *Software engineering: A practitioner's approach* (5<sup>th</sup> Ed.). Boston: McGraw-Hill.
- Rieh, S. Y. (2004). On the web at home: Information seeking and web searching in the home environment. *Journal of the American Society for Information Science and Technology*, 55(8), 743–753.
- Rodgers, W., & Negash, S. (2007). The effects of web-based technologies on knowledge transfer. *Communications of the ACM*, 50(7), 117–122.
- Ruffini, M. F. (2001). Blueprint to develop a great web site. *T H E (Technological Horizons in Education)*. Retrieved October 21, 2009, from <http://thejournal.com/Articles/2001/03/01/Blueprint-to-Develop-a-Great-Web-Site.aspx>.
- Ryan, C., & Rao, U. (2008). Holiday users of the Internet – Ease of use, functionality and novelty. *International Journal of Tourism Research*, 10, 329–339.
- Sandvig, J. C., & Bajwa, D. (2004). Information seeking of university web sites: An exploratory study. *The Journal of Computer Information Systems*, 45(1), 13–22.
- Seethamraju, R. (2006). Web quality – A study of user perceptions. *IIMB Management Review*, 18(1), 15–24.
- Sindhuja, P. N., & Dastidar, S. G. (2009). Impact of the factors influencing website usability on user satisfaction. *The IUP Journal of Management Research*, 8(12), 54–66.
- Sugar, W. A. (2001). What is so good about user-centered design? Documenting the effect of usability sessions on novice software designers. *Journal of Research on Computing in Education*, 33(3), 235–250.
- Sun, P., Unger, J. B., Palmer, P. H., Gallaher, P., Chou, C., Garbanati, L., Sussman, S., & Johnson, C. (2005). Internet accessibility and usage among urban adolescents in Southern California: Implications for web-based health research. *CyberPsychology & Behavior*, 8(5), 441–453.
- Tarafdar, M., & Zhang, J. (2005). Analyzing the influence of web site design parameters on web site usability. *Information Resource Management Journal*, 18(4), 62–80.
- Tarafdar, M., & Zhang, J. (2007). Determinants of reach and loyalty – A study of website performance and implications for website design. *The Journal of Computer Information Systems*, 48(2), 16–24.
- Tatnall, A. (2009). Gateways to portals research. *International Journal of web portals*, 1(1), 1–15.
- Usability.gov. (n.d.). *What does usability measure*. Retrieved January 2, 2010, from <http://www.usability.gov/basics/index.html>.
- Wang, Y. J., Hong, S., & Lou, H. (2010). Beautiful beyond useful? The role of web aesthetics. *The Journal of Computer Information Systems*, 50(3), 121–129.
- Wegener, D. R., Gog-Ong, A.M., & Lim, M.L. (2004). Web usability testing in a polytechnic library. *The Australian Library Journal*, 53(2). Retrieved January 2, 2011, from <http://alia.org.au/publishing/alj/53.2/full.text/wegener.html>.
- Zaharias, P., & Poylymenakou, A. (2009). Developing a usability evaluation method for e-learning applications: Beyond functional usability. *International Journal of Human-Computer Interaction*, 25(1), 75–98.
- Zhang, X., Prybutok, V., & Huang, A. (2006). An empirical study of factors affecting e-service satisfaction. *Human Systems Management*, 25, 279–291.

## Appendix

### Guidelines for Web Portal Developers

1. Know your intended users. Know what they need, their skills, and their purpose of usage of the web portal.
2. Make an actual interview in a representative sample of the user.
3. Involve users in the development of the web portal. Make a constant interaction with them during the development and deployment phase of the web portal.
4. Ensure that educational materials, such as electronic journals, e-books, and other scholarly manuscripts are available and accessible on the web portal.
5. Ensure a reliable uploading and downloading mechanisms of the web portal. This will enable the faculty to upload academic files for students' perusal.
6. Provide a reasonable memory space for uploading of files.
7. Ensure that the web portal can hold different types of files. It should not only be limited to word or PowerPoint documents.
8. Test the web portal before implementing to a representative sample. Testing the web portal to the actual user will identify the pitfalls of the software.
9. Provide orientation and help. All users will definitely pass through the stage of novice users. An orientation on the purpose, navigation, and usage of the web portal will be very beneficial to attain the web portal high usability.
10. Provide feedback mechanisms. The purpose and the problem of the usage of the web portal together with the emergence of new web technologies will make an existing portal obsolete. A feedback mechanism will greatly help in improving a web portal.
11. Develop a web portal that can log the actual hours of usage of the users. The actual hours of usage of the users are strong indication on the commitment to the use of the web portal. This is very beneficial on measuring the usability of a web portal.