

A Comparison between Quantity Surveying and Information Technology Students on Web Application in Learning Process

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ABSTRACT

The use of web applications has become a trend in many disciplines including education. In view of the influence of web application in education, this study examines web application technologies that could enhance undergraduates' learning experiences, with focus on Quantity Surveying (QS) and Information Technology (IT) undergraduates. The objectives of the study are to determine the level of usage of educational related web applications by QS undergraduates and IT undergraduates, and to determine if there are any statistically significant differences in the use of educational related web applications by QS undergraduates compared to IT undergraduates. The data for this survey were collected from 130 QS undergraduates and 42 IT undergraduates from two higher education institutions in Malaysia. Descriptive statistics and inferential statistics are used to analyze the data. Descriptive statistics are used to determine the level of usage of each web application among the two groups of students. The value of median is determined to measure the central tendency of each variable as the data is of ordinal level in measurement. As for the inferential statistics, this study uses statistical hypotheses testing to determine whether there is any statistically significant difference between QS undergraduates and IT undergraduates in the use of web applications. The findings of the study indicate that undergraduates of both QS and IT are exposed to web applications. However, they are more familiar with certain applications (e.g., Social Networking, Web Search, etc.) but unfamiliar with other applications (e.g., Online Portfolio, Podcast, etc.), the usage of web applications by QS undergraduates are on par with IT undergraduates although there are certain differences in the pattern of usage observed, and the differences of the web application usage pattern can be explained by the differences of the nature of the studies of both disciplines, in which QS undergraduates are required more in searching for data through the web whereas IT undergraduates are required to use the web applications for developing IT systems.

Keywords: *Web applications, education, learning process, Quantity Surveying, Information Technology, undergraduates*

INTRODUCTION

The advancement of information technology has resulted in the rapid development of web applications. According to Jazayeri (2007), a web application is an application that is invoked with a Web browser over the Internet. Ever since 1994 when the Internet became available to the public and especially in 1995 when the World Wide Web put a usable face on the Internet, the Internet has become a platform of choice for a large number of ever-more sophisticated and innovative Web applications.

Web applications have been used by users of various disciplines of works including education. The process of teaching and learning is believed to be more effective with the use of web applications. The trend

of increasing using of web applications in education was observed over the years.

According to Chang et al. (2003) more and more academics are accepting the challenge of using web-based or online learning in higher education to deliver coursework. Many websites indicate that an opportunity for students to receive coursework via the Web is routine at most universities. The Internet/Web has become an important change agent in higher education and universities are reviewing their strategic plans to incorporate online learning. Shotsberger et al. (2001) emphasized that wireless networks are now supporting Web browsing, e-mail, real-time chat, and access to remote computing resources. With the increasing use of small portable computers, this emerging communications infrastructure will enable many new Internet applications.

On the other hand, Laffey (2006) introduced Shadow netWorkspace (SNS), which is a web application system that allows a school or any type of community to establish an intranet with network workspaces for all members and groups. The goal of SNS has been to make it easy for schools and other educational organizations to provide network services for supporting implementation of learning communities.

In view of the potential influence of web application in education, this study examines web application technologies that could enhance undergraduates' learning experiences, with focus on Quantity Surveying (QS) and Information Technology (IT) undergraduates.

The objectives of the study are to:

1. Determine the level of usage of educational related web applications by QS undergraduates and IT undergraduates.
2. Determine if there is any statistically significant difference in the use of educational related web applications by QS undergraduates compared to IT undergraduates.

LITERATURE REVIEW

According to Swapna Kumar (2009), web tools should be integrated into higher education because the current generation of students expects to learn with new technologies and this is also because higher education should prepare students for the workplace of the future. His research indicates that undergraduates appreciate teaching and learning experiences where new technologies add value to existing practice, enhance the learning process, and gratify different types of learners. They take Web 2.0 for granted as a part of their daily lives, and would like to see it integrated into higher education only if it enriches their learning experience.

A study conducted by Maged et al. (2006) found that the latest generation of collaborative Web-based tools, namely wikis, blogs, and podcasts, offer many unique and powerful information sharing and collaboration features. If effectively deployed, wikis, blogs and podcasts could offer a way to enhance students' learning experiences, and deepen levels of learners' engagement and collaboration within digital learning environments.

Sirje (2008) in his research concluded that web tools are influencing the way people learn, access information and communicate with each other. To succeed in our modern society, educators should take advantage of new information and communication technologies and consider the learning preferences of digital natives as well as digital immigrants.

This study focuses on web tools that could enhance Quantity Surveying undergraduates' learning experiences. The following lists selected web applications that are relevant to Quantity Surveying undergraduates in their learning process.

Course Website/E-learning Portal is a course website created by an educational institution to provide detailed information about what a course covers. It normally includes details about course requirements, texts, and other resources and can be a valuable resource for students to plan their schedules.

Web Search is a web search engine designed to search for information on the World Wide Web. The search results may consist of web pages, images, information and other types of files (Wikipedia, 2012).

A wiki is a website which allows its users to add, modify, or delete its content via a web browser. A wiki

is essentially a database for creating, browsing, and searching through information (Wikipedia, 2012). It is useful for obtaining quick background information on unfamiliar subjects.

Scholar Website is an online web-based tool that provides a search of scholarly literature across various disciplines and sources, including theses, books, abstracts and journals.

Educational Video Sharing Site focuses on educational content such as instructional videos providing answers to common questions; professional and user-generated how-to videos; lectures and course materials for students, teachers, and self-learners; and high quality multimedia content ideal for classroom use.

Instant Messaging (IM) is a form of communication over the Internet that offers an instantaneous transmission of text-based messages from sender to receiver (Wikipedia, 2012).

Blog refers to a simple webpage consisting of brief paragraphs of opinion, information, personal diary entries, or links, called posts, arranged chronologically with the most recent first, in the style of an online journal (Doctorow et al., 2002). Most blogs also allow visitors to add a comment below a blog entry.

Discussion Group is an informal gathering of individuals through a website to exchange ideas, information, and suggestions on needs, problems, subjects, and so forth. (Business Dictionary.com, 2012).

Social Networking Websites or social networking sites (SNS) are important now to not only keep in touch with people but also beneficial for educational purposes in various ways. Both teachers and students have found educational benefits in using social networking sites. Social networking sites such as Facebook, Multiply, Myspace, and so forth are used by all age of people across the world to connect with others and for educational purpose including online sharing of education-related topics -- learning outside of school, college or college planning, about schoolwork and more (Manvi1111, 2010).

Web Translator is an online translation service which is used to translate text, words and phrases. It helps users to improve their understanding and communications in multiple languages.

Online Maps is a web mapping service application and technology that offers street maps, a route planner and an urban business locator for numerous countries around the world (Wikipedia, 2012). This tool is useful for Quantity Surveying undergraduate especially when they need to go for site visits.

Electronic mail, commonly known as email or e-mail, is a method of exchanging digital messages from an author to one or more recipients (Wikipedia, 2012).

Online Event Planner is a free time-management web application enabling users to keep track of their events and share their schedules with others. Users can even receive event reminders via email or have text messages sent right to their mobile phone.

Online Office and Storage is a type of office suite offered by websites in the form of software as a service. They can be accessed online from any Internet-enabled device running any operating system. This allows people to work together worldwide and at any time, thereby leading to international web-based collaboration and virtual teamwork. Online storage, also known as file hosting or cloud storage, is an Internet hosting service specifically designed to host user files. It allows users to upload files that could then be accessed over the internet from a different computers, tablets, smart phones or other networked devices, by the same user or possibly by other users, after a password or other authentication is provided (Wikipedia, 2012).

Online Portfolios are used to plan, organize and document education, work samples and skills. People use career portfolios to apply for jobs, college or training programs, salary increment, to show transferable skills, and to track personal development (Wikipedia, 2012).

Podcast is a type of digital media consisting of an episodic series of audio files subscribed to and downloaded through web syndication or streamed online to a computer or mobile device (Wikipedia, 2012).

As a summary, various web applications have been identified through the review of literature. The literature have introduced and suggested the use of those applications.

METHODOLOGY

Sample

The data for this survey were collected from 130 QS undergraduates and 42 IT undergraduates from two higher education institutions in Malaysia. Survey questionnaires were personally distributed and collected from the respective respondents. All respondents completed the questionnaires, yielding a response rate of 100%.

Measurement

The questionnaire aimed at determining the level of usage of web applications in respondents' learning process. The respondents were requested to indicate the extent of their level of usage in relation to web application (identified from the literature review) on a 6-point scale (1 = Not Aware, 2 = Aware But Never Use, 3 = Use Less Than Once per Month, 4 = Use At Least Once per Month, 5 = Use At Least Once per Week, 6 = Use At Least Once per Day).

The items listed in section one are:

1. Blog (e.g. Blogger, WordPress) -Maintain own Blog and respond to people comments
2. Blog (e.g. Blogger, WordPress) -Read Blog of others
3. Course Website / E-learning Portal - Submit coursework. to course website / E-learning portal
4. Course Website / E-learning Portal - Download course material from course website / E-learning portal
5. Discussion Groups (e.g. Google Groups, Yahoo Groups)
6. Educational Video Sharing Site (e.g. YouTube)
7. Email (e.g. Yahoo! mail, Gmail, hotmail)
8. Instant Messaging (e.g. MSN, Yahoo Messaging, Google talk)
9. Online Event Planner (e.g. Google Calendar)
10. Online Maps (e.g. Google Maps)
11. Online Office and Storage (e.g. Google Docs, SkyDrive)
12. Online Portfolio (e.g., Portfoliopen)
13. Podcast
14. Scholar Website (e.g., Google Scholar)
15. Social Networking Website (e.g., Facebook, MySpace, Friendster, Twitter, Plurk)
16. Web Search (e.g., Google Search, Yahoo! Search)
17. Web Translator (e.g., Google Translate, Yahoo! Babel Fish)
18. Wikis (e.g., Wikipedia)

Data Analysis

Descriptive statistics and inferential statistics are used to analyze the data. Descriptive statistics are used to determine the level of usage of each web application among the two groups of students. The value of median is determined to measure the central tendency of each variable as the data is of ordinal level in measurement. As for the inferential statistics, this study uses statistical hypotheses testing to determine whether there is any statistically significant difference between QS undergraduates and IT undergraduates in using web applications.

Daniel (1990) stated that there are two statistical hypotheses: the null hypothesis (designated H_0) and alternative hypothesis (designated H_1). The null hypothesis is the hypothesis that we test. It is always a

statement of no difference, no effect, or status quo. The alternative hypothesis is mutually exclusive and complementary of null hypothesis. A null hypothesis is presumed to be true until sufficient evidence to reject it has been amassed.

The test procedure, which is based on information derived from the data of an appropriate sample, results in one of two statistical decisions: (1) a decision to reject the null hypothesis (as false) or (2) a decision not to reject the null hypothesis because the sample does not provide sufficient evidence to warrant rejection.

This research applies Mann-Whitney U test for the hypothesis testing as the data of the research fulfill the assumptions of the test (Daniel, 1990), that is:

- a) The data consist of a random sample of observations X_1, X_2, \dots, X_{n1} from population 1 with unknown Median M_X , and another random sample of observations Y_1, Y_2, \dots, Y_{n2} from population 2 with unknown median M_Y .
- b) The two samples are independent.
- c) The variable observed is a continuous random variable.
- d) The measurement scale employed is at least ordinal.
- e) The distribution functions of the two populations differ only with respect to location, if they differ at all.

The hypothesis testing is conducted for each of the web application to determine whether the null hypothesis (i.e. there is no difference) on the level of usage of the particular web application between the two groups of students can be rejected. The hypotheses (two-sided) of this research are:

$$H_0: M_X = M_Y.$$

$$H_1: M_X \neq M_Y.$$

In addition, the Cronbach's alpha coefficient is determined to measure the internal consistency of a test or scale (Tavakol & Dennick, 2011).

RESULTS

For the part of descriptive statistics, Table 1 shows the level of usage of web applications among QS undergraduates and IT undergraduates respectively. The values of median are as shown in Table 2. From the results, QS students are having higher level of usage compared with IT students in Blog (Read Blog of others), Email, Instant Messaging, Online Maps, Online Office and Storage, Scholar Website and Wikis. On the other hand, IT students are scoring higher level of usage compared with QS students in Course Website / E-learning Portal (Submitting coursework), Online Portfolio and Web Translator.

Table 1: The Level of Usage of Web Applications by QS and IT Undergraduates

Type of Web Applications	Group	Not Aware		Aware But Never Use		Use Less Than Once Per Month		Use At Least Once Per Month		Use At Least Once Per Week		Use At Least Once Per Day	
		(1)	(2)	(3)	(4)	(5)	(6)						
		f	%	f	%	f	%	f	%	f	%	f	%
Blog (e.g., Blogger, WordPress) - Maintain own Blog and respond to people's comments	QS	30	23.3	70	54.3	10	7.8	5	3.9	10	7.8	4	3.1
	IT	4	9.5	24	57.1	5	11.9	3	7.1	4	9.5	2	4.8
Blog (e.g., Blogger, WordPress) -Read Blog of others	QS	2	1.6	25	19.4	29	22.5	30	23.3	23	17.8	20	15.5
	IT	3	7.1	18	42.9	7	16.7	4	9.5	7	16.7	3	7.1
Course Website / E-learning Portal - Download course material from course website / E-learning portal	QS	0	0.0	1	0.8	2	1.5	24	18.5	95	73.1	8	6.2
	IT	1	2.4	2	4.9	0	0.0	0	0.0	18	43.9	20	48.8
Course Website / E-learning Portal - Submit coursework to course website / E-learning portal	QS	19	14.7	34	26.4	13	10.1	17	13.2	41	31.8	5	3.9
	IT	1	2.4	0	0.0	0	0.0	0	0.0	22	53.7	18	43.9
Discussion Groups (e.g., Google Groups, Yahoo Groups)	QS	24	18.5	50	38.5	22	16.9	10	7.7	15	11.5	9	6.9
	IT	18	42.9	14	33.3	3	7.1	2	4.8	4	9.5	1	2.4
Educational Video Sharing Site (e.g., YouTube)	QS	2	1.6	25	19.4	16	12.4	14	10.9	54	41.9	18	14.0
	IT	0	0.0	4	9.5	2	4.8	5	11.9	12	28.6	19	45.2
Email (e.g., Yahoo! mail, Gmail, hotmail)	QS	0	0.0	1	0.8	5	3.9	17	13.2	36	27.9	70	54.3
	IT	0	0.0	0	0.0	3	7.1	12	28.6	14	33.3	13	31.0
Instant Messaging (e.g., MSN, Yahoo Messaging, Google talk)	QS	1	0.8	31	23.8	30	23.1	25	19.2	23	17.7	20	15.4
	IT	0	0.0	12	28.6	11	26.2	5	11.9	6	14.3	8	19.0
Online Event Planner (e.g., Google Calendar)	QS	21	16.2	64	49.2	26	20.0	14	10.8	3	2.3	2	1.5
	IT	7	17.5	21	52.5	2	5.0	7	17.5	2	5.0	1	2.5

Type of Web Applications	Group	Not Aware		Aware But Never Use		Use Less Than Once Per Month		Use At Least Once Per Month		Use At Least Once Per Week		Use At Least Once Per Day	
		(1)	(2)	(3)	(4)	(5)	(6)						
		f	%	f	%	f	%	f	%	f	%	f	%
Online Maps (e.g., Google Maps)	QS	1	0.8	13	10.1	38	29.5	46	35.7	26	20.2	5	3.9
	IT	0	0.0	10	23.8	12	28.6	10	23.8	8	19.0	2	4.8
Online Office and Storage (e.g., Google Docs, SkyDrive)	QS	22	16.9	37	28.5	17	13.1	14	10.8	17	13.1	23	17.7
	IT	6	14.3	19	45.2	7	16.7	7	16.7	1	2.4	2	4.8
Online Portfolio (e.g. Portfoliopen)	QS	65	50.4	48	37.2	12	9.3	3	2.3	1	0.8	0	0.0
	IT	12	28.6	19	45.2	6	14.3	2	4.8	3	7.1	0	0.0
Podcast	QS	80	62.0	44	34.1	4	3.1	1	0.8	0	0.0	0	0.0
	IT	24	57.1	12	28.6	3	7.1	2	4.8	1	2.4	0	0.0
Scholar Website (e.g., Google Scholar)	QS	18	14.0	20	15.5	17	13.2	30	23.3	28	21.7	16	12.4
	IT	14	33.3	10	23.8	7	16.7	5	11.9	4	9.5	2	4.8
Social Networking Website (e.g., Facebook, MySpace, Friendster, Twitter, Plurk)	QS	0	0.0	2	1.5	4	3.1	3	2.3	36	27.7	85	65.4
	IT	0	0.0	0	0.0	1	2.4	2	4.8	5	11.9	34	81.0
Web Search (e.g., Google Search, Yahoo! Search)	QS	0	0.0	0	0.0	0	0.0	6	4.6	34	26.2	90	69.2
	IT	0	0.0	0	0.0	1	2.4	1	2.4	6	14.3	34	81.0
Web Translator (e.g., Google Translate, Yahoo! Babel Fish)	QS	2	1.5	5	3.8	8	6.2	23	17.7	50	38.5	42	32.3
	IT	0	0.0	0	0.0	3	7.1	1	2.4	17	40.5	21	50.0
Wikis (e.g., Wikipedia)	QS	1	0.8	6	4.7	17	13.2	30	23.3	56	43.4	19	14.7
	IT	0	0.0	2	4.8	4	9.5	16	38.1	16	38.1	4	9.5

f = frequency

% = percentage

Table 2: Medians of the Level of Web Application

Type of Web Applications	QS (Median)	IT (Median)
Blog (e.g., Blogger, WordPress) -Maintain own Blog and respond to people’s comments	2.00	2.00
Blog (e.g., Blogger, WordPress) -Read Blog of others	4.00	2.50

Course Website / E-learning Portal - Download course material from course website / E-learning portal	5.00	5.00
Course Website / E-learning Portal - Submit coursework to course website / E-learning portal	3.00	5.00
Discussion Groups (e.g., Google Groups, Yahoo Groups)	2.00	2.00
Educational Video Sharing Site (e.g., YouTube)	5.00	5.00
Email (e.g., Yahoo! mail, Gmail, hotmail)	6.00	5.00
Instant Messaging (e.g., MSN, Yahoo Messaging, Google talk)	4.00	3.00
Online Event Planner (e.g., Google Calendar)	2.00	2.00
Online Maps (e.g., Google Maps)	4.00	3.00
Online Office and Storage (e.g., Google Docs, SkyDrive)	3.00	2.00
Online Portfolio (e.g., Portfoliopen)	1.00	2.00
Podcast	1.00	1.00
Scholar Website (e.g., Google Scholar)	4.00	2.00
Social Networking Website (e.g., Facebook, MySpace, Friendster, Twitter, Plurk)	6.00	6.00
Web Search (e.g., Google Search, Yahoo! Search)	6.00	6.00
Web Translator (e.g., Google Translate, Yahoo! Babel Fish)	5.00	5.50
Wikis (e.g., Wikipedia)	5.00	4.00

Table 3 shows the results of the Mann-Whitney U Test. The null hypotheses of ten items of web applications are rejected. From the ten items, six items show more usage among IT undergraduates compared to QS graduates whereas the other four items indicate otherwise. The six items of web applications that receiving more usage from IT undergraduates are:

1. Blog (e.g., Blogger, WordPress) - Maintain own Blog and respond to people comments (Significant at the level of .05)
2. Course Website / E-learning Portal - Download course material from course website / E-learning portal (Significant at the level of .01).
3. Course Website / E-learning Portal - Submit coursework to course website / E-learning portal (Significant at the level of .01).
4. Educational Video Sharing Site (e.g. YouTube) (Significant at the level of .01).
5. Online Portfolio (e.g. Portfoliopen) (Significant at the level of .01).
6. Web Translator (e.g. Google Translate, Yahoo! Babel Fish) (Significant at the level of .01).

The four items of web applications that receiving more usage from QS undergraduates are:

1. Blog (e.g., Blogger, WordPress) -Read Blog of others (Significant at the level of .01).
2. Discussion Groups (e.g., Google Groups, Yahoo Groups) (Significant at the level of .01).
3. Email (e.g., Yahoo! mail, Gmail, hotmail) (Significant at the level of .01).
4. Scholar Website (e.g., Google Scholar) (Significant at the level of .01).

The Cronbach's alpha of .755 is achieved for the data of this study. The value is in the range of value for the category of "Acceptable" in the commonly accepted rule of thumb for describing internal consistency (Wikipedia, 2013).

The above research findings cannot be compared with findings of similar research because similar studies cannot be identified through review of literature.

Table 3: Results of Mann-Whitney Test

Type of Web Applications	QS		IT		Mann-Whitney U Test Asymp. Sig. (2-tailed)
	Mean Rank	Sum of Ranks	Mean Rank	Sum of Rank	
1. Blog (e.g., Blogger, WordPress) - Maintain own Blog and respond to people comments	82.07	10586.50	98.08	4119.50	.045*
2. Blog (e.g., Blogger, WordPress) - Read Blog of others	92.44	11925.00	66.21	2781.00	.002**
3. Course Website / E-learning Portal - Download course material from course website / E-learning portal	76.79	9983.00	115.20	4723.00	.000**
4. Course Website / E-learning Portal - Submit coursework to course website / E-learning portal	70.62	9110.50	132.30	5424.50	.000**
5. Discussion Groups (e.g. Google Groups, Yahoo Groups)	92.59	12036.50	67.65	2841.50	.003**
6. Educational Video Sharing Site (e.g., YouTube)	78.58	10137.00	108.79	4569.00	.000**
7. Email (e.g., Yahoo! mail, Gmail, hotmail)	91.65	11822.50	68.65	2883.50	.005**
8. Instant Messaging (e.g., MSN, Yahoo Messaging, Google talk)	87.20	11336.50	84.32	3541.50	.739
9. Online Event Planner (e.g. Google Calendar)	85.57	11124.50	85.26	3410.50	.970
10. Online Maps (e.g., Google Maps)	88.69	11441.00	77.74	3265.00	.197
11. Online Office and Storage (e.g., Google Docs, SkyDrive)	90.39	11750.50	74.46	3127.50	.065
12. Online Portfolio (e.g., Portfoliopen)	80.40	10371.00	103.21	4335.00	.005**
13. Podcast	84.15	10855.00	91.69	3851.00	.319
14. Scholar Website (e.g., Google Scholar)	93.67	12083.50	62.44	2622.50	.000**
15. Social Networking Website (e.g., Facebook, MySpace, Friendster, Twitter, Plurk)	83.43	10846.00	96.00	4032.00	.053
16. Web Search (e.g., Google Search, Yahoo! Search)	84.18	10944.00	93.67	3934.00	.170
17. Web Translator (e.g., Google Translate, Yahoo! Babel Fish)	81.20	10555.50	102.92	4322.50	.009**
18. Wikis (e.g. Wikipedia)	87.74	11319.00	80.64	3387.00	.395

* Significant at the level of .05

** Significant at the level of .01

DISCUSSIONS

The present study has yielded several important findings. The findings of the study indicate that, generally, undergraduates of both QS and IT are exposed to web applications. However, they are more familiar with certain applications (e.g., Social Networking, Web Search, etc.) but unfamiliar with other applications (e.g., Online Portfolio, Podcast, etc.).

The usage of web applications by QS undergraduates are on par with IT undergraduates although there are certain differences on the pattern of usage observed. Also, the differences of the web application usage pattern can be explained by the differences in the nature of the studies of both disciplines, in which QS undergraduates are required more in searching for data through the web whereas IT undergraduates are required to use web applications for developing IT systems.

CONCLUSION

Both QS and IT undergraduates are well exposed to the web applications in their learning process. However, there is difference in the types of web applications familiar to the two categories of undergraduates. The usage of those web applications is influenced by the nature of studies of both disciplines.

LIMITATIONS

The authors would like to highlight the limitations of this study:

1. The authors had no control to ensure the most appropriate undergraduates were selected to respond to the questionnaire.
2. The willingness of the respondents to reveal their awareness, level of usage and the usefulness of web applications was uncertain.

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