Web 2.0 usage among New Zealand learners: Findings on gender difference

Ning Wei
New Zealand
ninghuiwei@hotmail.com

Dr. Kay Fielden
New Zealand
kayafelden@gmail.com

Dr. Donald Joyce
dcjoyce@xtra.co.nz


Abstract

In this paper, gender differences in Web 2.0 usage by postgraduate students in New Zealand are presented. 84 postgraduate students drawn from two different convenience samples were surveyed to discover the extent to which they used and were familiar with Web 2.0 applications. According to Cuadrado-García, Ruiz-Molina and Montoro-Pons (2010, p. 367), "men and women differ in their interaction with technology". In this study, gender differences in the use of different Web 2.0 applications and technologies have been considered. Whilst findings from this study are limited by the way in which the populations were sampled, the sample size and having a majority of international students with English as a second language, it is interesting to note that there were only minor differences between the ways in which male and female postgraduate students use Web 2.0 applications.

Keywords

gender, Web2.0, YouTube, Facebook, MSN, blogging, Wiki, Forum

1. Introduction

Gender-based research on the use of Web 2.0 technologies is a domain in which differences, social settings, culture, learning, networking and making friends has changed and is still changing with time. As many more applications exploit this technical domain, the question being asked in this research is "what are the differences between males and females in their use of Web 2.0 applications and technologies?"

This paper is organized as follows: current literature that explores gender differences in terms of using Web 2.0 is presented (section 2), then the research method is
described (section 3). After that, the data analysis is discussed (section 4) and conclusions for this study are drawn (section 5).

2. Literature Review

In 2005, O'Reilly first defined the term Web 2.0, stating that any web page capable of "reading and writing" could be considered as Web 2.0. Obviously, this technology offers a good method to handle the issues of E-learning because Web 2.0 has the potential ability to improve the level of interaction and co-operative working and the updating of learning resources. The main philosophy behind eLearning 2.0 is that knowledge is socially constructed, where learning and teaching occurs via the conversations and discussion around the learning contents and via the grounded interactions about the learning problems and actions. In order to integrate Web 2.0 technologies into E-Learning systems, it is important to obtain the users' perceptions of Web 2.0, because interactivity and co-operative learning is central to E-Learning 2.0. According to Cuadrado-García et al. (2010), users' perceptions may be affected by different personal factors, like gender and age. In addition, Adamus, Kerres, Getto and Engelhardt (2009) pointed out that there are more males on the Internet as well as using computer technologies. Therefore, the purpose of this study is to gain further knowledge about how gender is associated with Web 2.0. The research question posed for this study was: How do gender differences manifest in using Web 2.0 applications?

In 2004, McCoy and Heafner (2004) claimed that men and women display different degrees of "anxiety, acceptance and interest" toward new technology.

A study by Adamus et al (2009) found that females tended to be more involved in co-operative work than males and explored whether the cooperative features of Web 2.0, meant that more women were using Web 2.0 applications for learning.

NingShen and Khalifa (2010) pointed out there are significant differences in the ways that males and females use Facebook. At this time Facebook was the most visited site in the Internet, and therefore the most frequently used Web2.0 application.

Blau and Caspi (2010) found no significant differences between males and females in using Google applications for learning. However, according to Wu, Hsu, Teng and Wu (2010), males behave with more self-confidence and more skill in using Web 2.0 technologies, like WiKis.

Several studies indicated that males and females have different points of view about learning with the use of new technology (Adamus et al., 2009; Hegazy & Radwan, 2010; Jamili, 2010). NingShen and Khalifa (2010) point out that frequent activities during learning like "get information", "solve problem", and "generate ideas" all exhibit gender differences. Their study suggests that females are more likely than males to use Facebook in their learning.

Cuadrado-García et al (2010, p.368) suggested that: "women consider computers as social media and they are more involved than men in communicative activities".

In 2004, McCoy and Heafner (2004) claimed that men and women display different degrees of "anxiety, acceptance and interest" toward new technology.

A study by Adamus et al (2009) found that females tended to be more involved in co-operative work than males and explored whether the cooperative features of Web 2.0, meant that more women were using Web 2.0 applications for learning.

NingShen and Khalifa (2010) pointed out there are significant differences in the ways that males and females use Facebook. At this time Facebook was the most visited site in the Internet, and therefore the most frequently used Web2.0 application.

Blau and Caspi (2010) found no significant differences between males and females in using Google applications for learning. However, according to Wu, Hsu, Teng and Wu (2010), males behave with more self-confidence and more skill in using Web 2.0 technologies, like WiKis.

Several studies indicated that males and females have different points of view about learning with the use of new technology (Adamus et al., 2009; Hegazy & Radwan, 2010; Jamili, 2010). NingShen and Khalifa (2010) point out that frequent activities during learning like "get information", "solve problem", and "generate ideas" all exhibit gender differences. Their study suggests that females are more likely than males to use Facebook in their learning.

Cuadrado-García et al (2010, p.368) suggested that: "women consider computers as social media and they are more involved than men in communicative activities".

Last year, The Pew Internet and American Life Project (Duggan & Brenner, 2012) found that in a survey conducted with 1802 participants (male = 846, female = 956), that there was a slightly higher female participation in Web 2.0, and in particular social media sites.

Most recently, Pillay (2013) reported that Web 2.0 had not had quite the impact on E-learning that was previously expected. Pillay found that cultural background, language proficiency, communication style, socioeconomic and technological circumstances are contributing factors as well as learning styles and prior knowledge.

It would appear therefore, that opinion is divided on what gender-based implications are for the way in which Web 2.0 is used.

3. Research Method

In this research, descriptive statistics have been used to analyse data captured in an
online survey. Descriptive statistics were used to obtain "straight descriptions of phenomena" (Sandelowski, p. 339, 2000). Hypothesis testing was not used because the two groups of survey participants were not random samples of the populations from which they were drawn.

Sarantakos (2005) listed some techniques that can be applied for data analysis. These common techniques are listed below:

- Pattern-matching
- 'Explanation-building'
- Time-series analysis
- Making repeated observations (Sarantakos, 2005).

This investigation uses 'explanation-building' for the data analysis. Sarantakos (2005) indicated that 'explanation-building' "is based on a series of iterations" (p. 215). Therefore, the standard data analysis procedure follows the steps below:

Step 1: based on the literature review, issue an initial proposition: there are gender differences in using Web 2.0.

Step 2: check this proposition with the result of the online survey.

Step 3: if any discrepancies are found between the findings and the proposition, the proposition needs to be revised based on the findings.

Step 4: reissue the online survey according to the revised proposition.

For this study, these steps were followed, with the initial proposition being tested with a pilot survey.

In order to obtain the user requirements for this study of gender differences with Web 2.0 applications, an online survey was conducted with two populations between December 2010 and February 2011: postgraduate computing students at one New Zealand tertiary institution; and a Facebook community consisting of tertiary students from a variety of different institutions. Participants were recruited in two ways: one was by email sent to the online learning system's email list for postgraduate students enrolled in the Master of Computing programme at one tertiary institution (Sample A); the other was by adding the URL for the online survey to the researcher's Facebook page (Sample B). The postgraduate students from Sample B were studying Business, Computing and Engineering.

The online survey focused on the participants' perceptions of using Web 2.0 applications (such as Facebook, YouTube, Second Life, Wiki), such as usefulness and (dis)advantages.

Table 1: Demographic information of the survey participants (n=84)
There were 84 students in the Master of Computing email list and 198 on the Facebook page. 84 participants returned a valid response, with 39 being female and 45 male, 36 being from the Master of Computing (Sample A) and 48 from the Facebook page (Sample B). Participation in this study was voluntary.

The main research question for this study was: How do gender differences manifest in engaging with Web 2.0?

This study was limited because a convenience sample rather than a randomized sample was used. Results obtained therefore contain bias. Demographic results for this survey are contained in Table 1 above.

Table 1 shows that a majority of respondents was aged between 21 and 30 (57.8% male and 64.1% female). There were slightly more males in this study (45 males, and 39 females). There were more respondents studying at university (58.3% at university as opposed to 32.1% at Polytechnics and 9.5% of respondents categorized their tertiary study as 'other'). There were 71.1% male students and 30.8% female students studying Computing. Most participants in this study had a first language other than English (91.1% male and 71.8% female). These results can be expected given the nature of the two target groups in this research because the populations from which the two samples were drawn are predominantly international students.

4. Data Analysis

4.1 IT Experience

Respondents rated their own IT experience from 1 (which means "no experience") to 7 (which means "highly experienced") - see Table 2 and Figure 1. Chan (2009) argues that poor quality of self-reported data is no more than an urban legend. Chan suggests that respondents might provide researchers with inaccurate data sometimes but that there is little likelihood that respondents would lie about demographic information, such as gender and ethnicity.
Other studies have shown that self-reporting may not be reliable (Fetter, Stowe & Owings, 1984) and that males tend to over rate their own skills and females tend to under-rate their own skill levels.

In Table 2 below, the researchers were also interested in finding out how many participants were in a 'super-user' category, where they had experience with programming skills. In this group there were 7 (15.6%) males and 2 (5.1%) females who regarded themselves as 'highly experienced' in coding.

### Table 2. General experience of IT (n=84)

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No Exp</strong></td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Web</strong></td>
<td>6</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>17</td>
<td>15</td>
<td>33.3%</td>
<td>33.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Email</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>9</td>
<td>9</td>
<td>100%</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>My Space</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>8</td>
<td>100%</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Coding</strong></td>
<td>7</td>
<td>5</td>
<td>10</td>
<td>5</td>
<td>11</td>
<td>5</td>
<td>11.1%</td>
<td>11.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Highly Exp</strong></td>
<td>25</td>
<td>16</td>
<td>20</td>
<td>16</td>
<td>17</td>
<td>13</td>
<td>41%</td>
<td>41%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Number in the table is the respondent count for that rating)

**Figure 1. Higher ratings**

( % of males and females with rating 6 or 7)

Figure 1 shows that similar proportions of males and females rate their experience of web browsing, e-mail and MS Office as 6 or 7, but many more males rate their experience of coding as 6 or 7. This would indicate that there are more males than females in the 'super-user' category. Pedersen and Macafee (2007) also found that males were more likely to be 'super-users' of IT technology.

### 4.2 Perception of Usefulness

Respondents were asked their opinions of the usefulness of Web 2.0 applications and technologies - see Table 3 and Figure 2.

### Table 3. Gender differences in perceptions of Web 2.0 applications and technologies (n=84)
The results show that both females and males thought Facebook, Google applications, MSN, YouTube, Blogging, Wiki and Forum were useful Web2.0 tools. Higher proportions of females considered Facebook, Google applications, MSN, Blogging, Forum and Wiki as useful tools, with a majority of females rating their Blogging, Forum and Wiki use as ‘good’. Most of these findings match the conclusions of Collins and Hide (2010), except they found that Blogging had more male users and there was no difference between males and females in using Forum and Wiki. Similar proportions of male and female participants considered Myspace, Second Life and YouTube useful.

### 4.3 Advantages of Web 2.0

Table 4 shows the results obtained when respondents were asked to identify positive aspects of Web 2.0 applications and technologies. Respondents could select multiple responses and the numbers in the table are percentages of responses. Comments are made below when markedly different proportions of males and females selected a particular response.

**Table 4. Advantages of Web 2.0 applications and technologies for E-learning**

(n=75, 9 participants did not answer the question)
According to Chong and Bo (2011), Facebook is the most frequently explored social media application for all uses, including e-learning. Table 4 shows that a higher proportion of male respondents (9%) than females (4%) had not used Facebook. NingShen and Khalifa (2010) found that more females than males use Facebook to conduct co-operative work such as obtaining information, providing information, generating ideas, learning how to do things and solving problems.

A higher proportion of males had not used Google applications (11% of males and 5% of females had not used Google applications). More females thought that "co-operative learning" (17%) and "personalized environment" (16%) were advantages of Google applications, whereas more males thought that "virtualized environment" (13%) was an advantage.

A higher proportion of males (13% males to 5% females) had not used MSN. More females thought that "co-operative learning" and "concurrency control" were advantages of MSN, whereas more males thought that "free of cost" (28%) was an advantage.

A higher proportion of females had not used YouTube (10% females to 2% males). More females thought that "personalized environment" (13%) was an advantage of YouTube, whereas more males thought that "co-operative learning" (16%) and "free of cost" (31%) were advantages. According to Molyneaux, et al. (2008), males were the main users of YouTube and were more likely to post videos and comment on videos.

Similar proportions of male and female respondents identified the features of Blogging that contributed to learning. This result matched the research of Pusnik, Sumak and Hericko (2010), who found that there were no gender differences in using Blogging for learning.

A higher proportion of females had not used Forum (which pre-dated Facebook). More females thought that "personalized environment" (17%) was an advantage of Forum, whereas more males thought that "free of cost" (27%) and "ease of use" (25%) were advantages. This last result may relate to previous research of Pedersen and Macafee (2007), who found that males were better at handling technology.

More females thought that "personalized environment" (17%) was an advantage of WiKi, whereas more males thought that "concurrency control" (9%) was an advantage. Wu, Hsu, Teng and Wu (2009) found that there was no difference between genders in the use of WiKi for co-operative working and ease of use.

The general pattern identified in this research is that more males than females identify "free of cost" as an advantage of Web 2.0 applications and technologies and more females than males identify "personalized environment". However, Adamus et al. (2009) found that more females believed that "co-operative working" was important.
4.4 Disadvantages of Web 2.0

Table 5 shows the results obtained when respondents were asked to identify negative aspects of Web 2.0 applications and technologies. Respondents could select multiple responses and the numbers in the table are percentages of responses. Comments are made below when markedly different proportions of males and females selected a particular response.

Table 5. Disadvantages of Web 2.0 applications and technologies (n=75, 9 participants did not answer the question)

<table>
<thead>
<tr>
<th>Application</th>
<th>Not used</th>
<th>Lack of control</th>
<th>Lack of Information</th>
<th>Lack of Technical support</th>
<th>Not compatible with common application</th>
<th>Lack of academic function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facebook</td>
<td>Male</td>
<td>12%</td>
<td>26%</td>
<td>17%</td>
<td>20%</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>8%</td>
<td>24%</td>
<td>24%</td>
<td>18%</td>
<td>25%</td>
</tr>
<tr>
<td>Google</td>
<td>Male</td>
<td>10%</td>
<td>13%</td>
<td>25%</td>
<td>27%</td>
<td>25%</td>
</tr>
<tr>
<td>application</td>
<td>Female</td>
<td>9%</td>
<td>12%</td>
<td>24%</td>
<td>28%</td>
<td>18%</td>
</tr>
<tr>
<td>MSN</td>
<td>Male</td>
<td>15%</td>
<td>19%</td>
<td>21%</td>
<td>15%</td>
<td>31%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>9%</td>
<td>10%</td>
<td>28%</td>
<td>17%</td>
<td>29%</td>
</tr>
<tr>
<td>YouTube</td>
<td>Male</td>
<td>2%</td>
<td>30%</td>
<td>21%</td>
<td>25%</td>
<td>23%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>23%</td>
<td>10%</td>
<td>17%</td>
<td>22%</td>
<td>22%</td>
</tr>
<tr>
<td>Blogging</td>
<td>Male</td>
<td>14%</td>
<td>24%</td>
<td>17%</td>
<td>20%</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>9%</td>
<td>52%</td>
<td>29%</td>
<td>19%</td>
<td>22%</td>
</tr>
<tr>
<td>Forum</td>
<td>Male</td>
<td>6%</td>
<td>25%</td>
<td>23%</td>
<td>27%</td>
<td>19%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>10%</td>
<td>36%</td>
<td>31%</td>
<td>17%</td>
<td>17%</td>
</tr>
<tr>
<td>Wiki</td>
<td>Male</td>
<td>12%</td>
<td>25%</td>
<td>23%</td>
<td>17%</td>
<td>21%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>10%</td>
<td>24%</td>
<td>31%</td>
<td>15%</td>
<td>21%</td>
</tr>
</tbody>
</table>

Table 5 shows that a higher proportion of male respondents had not used Facebook (12% male to 8% female) and that more females than males thought "lack of technical support" (24% female to 17% male) was a disadvantage.

More females thought that "lack of information control" (22%) was a disadvantage of Google applications, whereas more males thought that "lack of academic functions" (25%) was a disadvantage.

A higher proportion of males had not used MSN (15% male to 9% female) and more females thought that "lack of technical support" (26%) was a disadvantage of MSN.

A higher proportion of females had not used YouTube (25% female to 2% male) and more males thought that "lack of information control" (30%) was a disadvantage of YouTube.

A higher proportion of males had not used Blogging (14% male to 9% female) and more females thought that "lack of technical support" (25%) was a disadvantage of Blogging.

A higher proportion of females had not used Forum. More males thought that "not compatible with common applications" (27%) were a disadvantage whereas more females thought that "lack of technical support" (31%) was a disadvantage.

More females thought that "lack of technical support" (31%) was a disadvantage of Wiki.

The general pattern identified in this research is that more females than males identify "lack of technical support" as a disadvantage of Web 2.0 applications and technologies. This result may relate to previous research of Pedersen and Macafee (2007), who suggested that males were better at handling technology. As a result, females may need more technical support than males.

One of the big disadvantages was "lack of information control". This result is consistent with the findings of NingShen and Khalifa (2010), who found that both males and females share personal information on Facebook very cautiously, because they believe that information, once posted, is hard to control. This result was also supported by Liebenberg and Lotriet (2010), who pointed out that the major issue
with instant messaging was its synchronous nature. In their research, both males and females identified concerns about the issue of information control, because they believed that information would be out of their control after it had been sent out.

5. Conclusion

In this study, exploratory research with a focus on gender differences has been conducted (as part of the first author's master's thesis research) about the use of Web 2.0 applications and technologies among New Zealand university and polytechnic students. The students who participated in this study were enrolled in five universities and two polytechnic institutes. The results obtained in the study show that more females focus on personalized environment and technical support and that more males are concerned about the cost.

In conclusion, the results obtained in this study show interesting gender differences in the use of Web 2.0 applications and technologies. However, there are very few consistent gender differences. This research has two limitations: firstly, most participants were international students and secondly, more than half of the participants were computing students. Therefore, further research is needed that should involve more diverse participants with wider discipline backgrounds and across the educational spectrum.

References


Ning Shen, K., & Khalifa, M. (2010). Facebook usage among Arabic college students: Preliminary findings on gender differences. *Proceedings of the 9th International Conference on Electronic Business* (pp.1080 -1087), Macao, P. R. China.


