



Gender differences in the use of Web 2.0 resources

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Abstract

The continuous increase in the number of Internet users and the emergence of Web 2.0, has led many researchers to focus their studies on these resources. Gender studies are not an exception. Yet, few attempts have tried to identify gender differences regarding the use of Web 2.0 tools. The purpose of this study was to identify gender differences in the use of Web 2.0 resources reported in literature. There were found gender inequalities, such as (i) females use more online networks than males, and specially older ones; (ii) while girls use weblogs to reinforce pre-existing friendships, boys use them for “flirting” and making new friends, (iii) the percentage of female weblogs authors is much higher than that of male authors; still, boys are more likely to download music and video files; (iv) regarding wikis, males edit more than females, post more mentions to other participant's posts and make more comments than do females overall, while female students show higher resource and wiki views, as well as uploaded documents; (v) women are more active and write more words in online discussion forums than males and (vi) men use more chats than women and both genders differ in discourse style; while women show more emotions, men tend to be judgmental and use more violent verbs.

Keywords: Web 2.0; Internet; gender studies; gender equity; gender differences.

Resumo

O crescente número de utilizadores da internet e a emergência da Web 2.0 levou muitos investigadores a focarem os seus estudos nestes recursos. Os estudos de género não foram excepção. Todavia, ainda existem poucas publicações sobre diferenças de género na utilização de ferramentas da Web 2.0. O objectivo deste estudo foi identificar as diferenças de género na utilização de recursos da Web 2.0 referidas na literatura. Foram encontradas diversas desigualdades de género: (i) as mulheres usam mais as redes sociais do que os homens, sobretudo as mais velhas; (ii)



enquanto as raparigas preferem usar weblogs para reforçar amizades pré-existentes, os rapazes usam-nos para seduzir e fazer novas amizades; (iii) a percentagem de raparigas autoras de weblogs é muito superior à percentagem de rapazes; por sua vez os rapazes descarregam mais músicas e vídeos do que as raparigas; (iv) relativamente a wikis, os rapazes editam mais do que as raparigas, referem mais vezes comentários feitos por outras pessoas e fazem mais comentários do que as mulheres, enquanto as mulheres fazem mais visualizações da wiki e descarregam mais documentos; (v) as mulheres são mais ativas e escrevem um maior número de palavras em fóruns de discussão online do que os homens e (vi) os homens usam mais os chats do que as mulheres e os dois géneros manifestam ainda diferenças ao nível do estilo de discurso usado; enquanto as mulheres revelam mais emoções, os homens tendem a ser mais críticos e usam palavras mais violentas.

Keywords: Web 2.0; Internet; estudos de género; equidade de género; diferenças de género.

Resumen

El creciente número de usuarios de Internet y de la Web 2.0 ha llevado a muchos investigadores a centrar sus estudios sobre esas herramientas. Los estudios de género no fueron una excepción. Sin embargo, hay pocos informes sobre diferencias de género en el uso de herramientas Web 2.0. El propósito de este estudio fue identificar las diferencias de género en el uso de la Web 2.0 mencionadas en la literatura. Se han encontrado varias desigualdades de género: (i) las mujeres usan más las redes sociales do que los hombres, sobre todo las mayores; (ii) mientras las mujeres prefieren utilizar los weblogs para reforzar las amistades ya existentes, los hombres los usan para seducir y hacer nuevos amigos, (iii) el porcentaje de mujeres escritoras de los weblogs es mucho más largo que el porcentaje de hombres; por su vez, los hombres descargan más vídeos y músicas que las mujeres; (iv) respecto a las wikis, los hombres editan más comentarios que las mujeres, refieren más veces los comentarios hechos por otras personas do que las mujeres y hacen más comentarios que las mujeres, mientras las mujeres hacen más visualizaciones de la wiki y descargan más documentos; (v) las mujeres son más activas y escriben más palabras en los foros de discusión online do que los hombres; (vi) los hombres usan más salas de chat do que las mujeres y los dos géneros tienen diferentes estilos de discurso; mientras que las mujeres desvelan más sus emociones, los hombres son más críticos y usan palabras más violentas.

Palabras clave: Web 2.0; Internet; estudios de género; equidad de género; diferencias de género.



Introduction

The internet has changed a lot over the past few years, mostly due to the still ongoing emergence of the several Web 2.0 resources, which were denominated as “Web 2.0”, in 2005, by Tim O’Reilly and Dale Dougher.

While the number and diversity of these applications increases, the Internet faces a growth in the number of users and, consequently, in the number of studies about Web 2.0. Several research findings are described in the literature about gender differences in computer access and appliance (Adamus, Kerres, Getto & Engelhardt, 2009). However, few attempts have tried to identify gender differences regarding the use of Web 2.0 resources. And despite of being also known as “Social Web”, there are still doubts whether Web 2.0 is actually promoting social and gender equity.

In order to clarify this issue, this paper seeks to address the following questions: Are there gender differences regarding the use of Web 2.0 resources? What are the main differences reported in the literature?

In an attempt to answer our research questions, we collected and analyzed several relevant articles, with a purpose to identify gender differences reported in the literature, regarding the use of Web 2.0 resources.

Based on Castells (1999) statement, “technology is society”, it is our belief that increasing the amount of information about gender differences in the use of technology, namely Web 2.0 resources, will contribute to a better understanding of gender roles and gender relations in a 21st century occidental society.



Theoretical framework

The Universal Declaration of Human Rights (1948) in its 19th article recognizes the right to information as a fundamental human right.

"Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers." – The Universal Declaration of Human Rights (1948, 19th article)

It is equally important to support the right to communicate as a fundamental human right. For this purposes, the Internet should be seen as an advantageous feature of the 21st century, as ICTs can be used to strengthen diversity and to provide a platform for a multitude of voices, a pluralism of ideas and opinions and a place for cross-cultural exchange (Primo, 2003).

According to a 2004 United Nations report on Gender and ICT in Central and Eastern Europe and the Commonwealth of Independent States, the positive aspects of Internet use by women include the most powerful characteristic of the possibility to create private, online spaces where people can share sensitive and personal information, exchange experiences, build solidarity, facilitate networking, develop campaigns and lobby more effectively, and where individuals are safe from harassment, enjoy freedom of expression and privacy of communication, and are protected from electronic surveillance and monitoring. However, there are still doubts whether the Internet is contributing to gender equality, women empowerment, women advancement and gender justice.

Web 2.0

In 2002, Shneiderman shifted the focus from what computers were used for, stating that "The old computing was about what computers could do; the new computing is about what users can do" (Shneiderman, 2002: 2). Shneiderman (2002) indicated that successful technologies were those that were in harmony with users' needs and supported relationships and activities that enrich the users' experience. According to this author, the transition from the old computing to the new computing required four features: the chance to gather information, the opportunity to communicate and relate to others, the possibility to create and innovate, and share and disseminate content.



Three years later, Tim O'Reilly (2005) proposed the label "Web 2.0" to describe 'social software' technologies, which included as their basal features users' participation, users as contributors, harnessing the power of the crowd and creating rich user experiences.

In 2009, Richardson, referring to the same 'social software' technologies, added the designation "Read Write Web". This label occurred because of the intrinsic characteristics of these applications that enable the user to consume the content available on the Internet ("read") and also to create it ("write").

As can be noticed, the Web 2.0 concept is not a consensual one. Nevertheless, authors agree that Web 2.0 emerged as a consequence of a change that the World Wide Web has gone through, which has transformed it into a platform. This platform is understood as a "place" that houses several applications, which benefit and improve as they are being used by a growing number of people. Furthermore, O'Reilly (2005) highlighted that the contributions of its users enrich the platform, as they are supplied by a "collective intelligence".

Among these 'social software' applications we can find weblogs, wikis, real simple syndication (RSS), aggregators, social bookmarking, online photo galleries and audio-video casting, besides many others. According to Richardson (2009), each of these applications can be described as follows: weblogs are interactive websites which are easily created and updateable, allowing the users to publish instantly from any Internet connection; wikis are collaborative web spaces where anyone can either add content or edit content that has already been published; RSS is a technology that allows educators to subscribe to "feeds" of the content that is created on the Internet and content comes to the reader instead of the reader retrieving the content; aggregators collect and enable the user to organize the content which is generated via the RSS feed; social bookmarking allows readers to save and archive entire pages, thus producing a form of searchable personal internet; online photo galleries allows users to publish digital photos to the Web, either shared with family and friends or with members of a photography community; audio/video-casting enables the users to produce digital voice and video files, giving the user the possibility to share them with the wide Internet audiences.



Gender

Gender, race and class are the three main features of an individual's identity (Kimmel, 2004: 5). Kimmel (2004) also underlines that gender should not be understood as a mere system of classification, by which biological males and biological females are sorted, separated and socialized into equivalent sex roles. Gender also expresses the universal inequality between women and men. The world "inequality" foresees that when we speak about gender we also speak about hierarchy, power, and not simply difference.

Regarding gender inequalities, several authors (Neto, Cid, Pomar, Peças, Chaleta & Folque, 2000; Kimmel, 2004 and Martinho, 2007) mention the renowned gender division proposed by Eleanor Maccoby and Carol Jacklin in 1974, after undertaking an analysis of over 600 empirical studies, from 1966 to 1973. These two psychologists only found four areas with significant and consistent sex differences: (i) girls have relatively higher verbal ability; (ii) boys have better visual and spatial ability; (iii) boys do better on mathematical tests; (iv) boys were consistently more aggressive than girls.

More recent studies, such as Trigueiros, Trigueiros, Martinez, Cepeda, Colmenares, Monge and Álvarez (2001), stated that some cultures, like our own, encourage men to be stoic and to prove their masculinity. This undervalue of the attitudes considered to be feminine produce in women specific effects that make them lose self-confidence. At the same time, a different socialization induces boys to be more competitive, to have more initiative, to be more well-succeeded and independent, while girls are encouraged to be more dependent, conformed and cooperative.

Gender inequalities

According to a 2004 United Nations report on Gender and ICT in Central and Eastern Europe and the Commonwealth of Independent States, the right to communicate implies that a new ICT environment must fully integrate gender concerns and women advancement. However, few attempts have tried to identify gender differences regarding the use of Web 2.0 resources over the last few years. And despite of being also known as "Social Web", there are still doubts whether Web 2.0 is actually promoting social and gender equity.

Following a review of the literature published within the time frame of five years, we tried to summarize the main gender differences found in the literature, regarding the use of Web 2.0 resources. But before presenting them, the main gender differences regarding the use of Internet in general will be exposed.



a) Internet in general

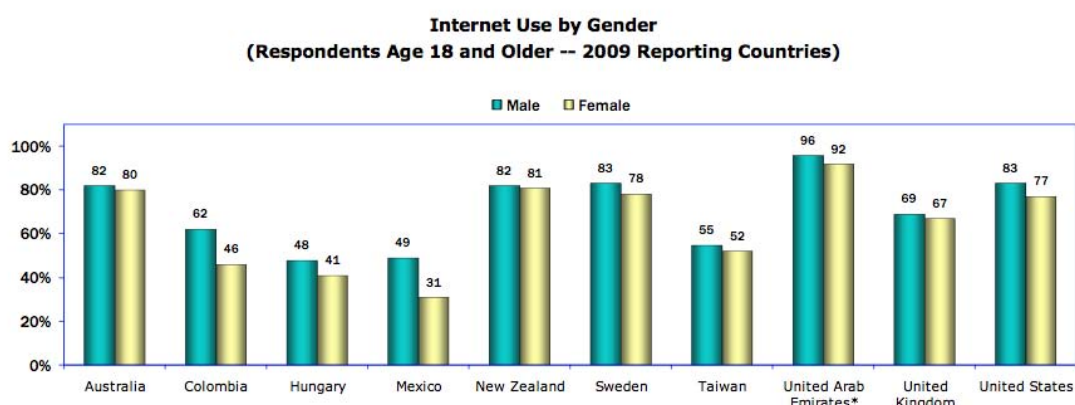
In 2000, long before the emergence of Web 2.0, Weiser (2000) stated that the gender gap in Internet use was rapidly diminishing. Two years later, Shaw and Gant (2002) also realized that the gender gap was narrowing over time. Already after the emergence of Web 2.0, Carstensen (2009) observed that the more widespread the Internet is, the less it is perceived as technical. As a consequence, the interpretation of the Internet as a male domain is becoming less common. However, this decrease in gender differences regarding the use of Internet is far from being consensual.

Inequalities in the use of Internet and Information and Communication Technologies (ICT) in general are repeatedly mentioned in the literature. In the last decade, literature on the effects of gender has suggested that there are differences between women and men in terms of communication styles, computer conferencing and use of the Internet (Gefen & Straub, 1997; Lu & Hsiao, 2009). Jackson, Ervin, Gardner and Schmitt (2001) found that males used more the Web than did females, but females used e-mail more than did males.

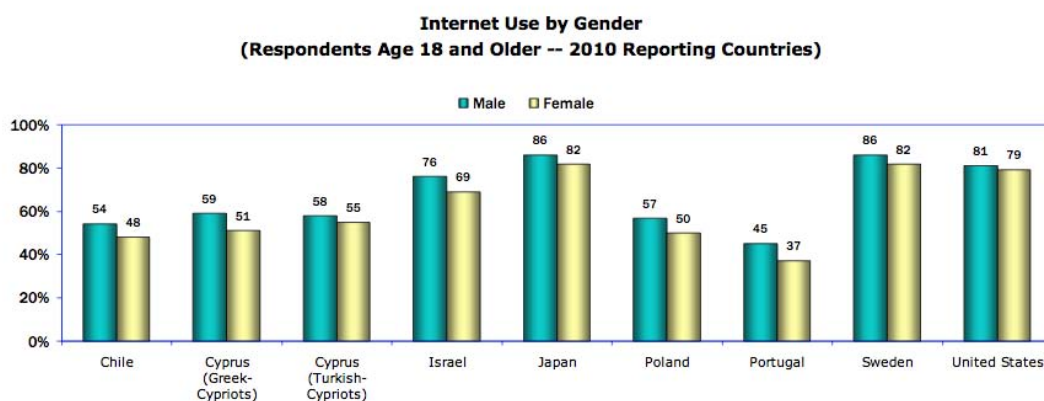
Gefen and Straub (1997) and Ong and Lai (2006) have suggested that gender plays an important role in determining technology use and behavior on the Internet. The 2012th international report World Internet Project (WIP), which is a partnership of research institutions that compiles data on the behavior and views of Internet users and non-users in 30 countries and regions in Europe, North America, South American, Asia, the Middle East and Australasia highlighted notable differences between men and women in their use of online technology and that more men than women use the Internet (**Graph 1** and **Graph 2**).

In four of the WIP countries in 2009, 6% percent or more men than women use the Internet (Colombia, Hungary, Mexico and the United States). The gender gap is the largest in Mexico (18% more men than women are Internet users) and Colombia (16% more men than women). In five of the WIP countries in 2010, 6% or more men than women go online: (Chile, Cyprus: Greek-Cypriots, Israel, Poland and Portugal).

However, in eight of the WIP countries, the gap in Internet use between men and women is 4% or less: in 2009, Australia, New Zealand, Taiwan, the United Arab Emirates and the United Kingdom; in 2010, Cyprus (Turkish-Cypriots), Japan, Sweden, and the United States.



Graph 1: Percentage of male and female use of Internet in 2009 in Australia, Colombia, Hungary, Mexico, New Zealand, Sweden, Taiwan, United Arab Emirates, United Kingdom and the United States. Source: WIP (World Internet Project) (2012)



Graph 2: Percentage of male and female use of Internet in 2010 in Chile, Cyprus (Greek-Cypriots), Cyprus (Turkish-Cypriots), Israel, Japan, Poland, Portugal, Sweden and the United States. Source: WIP (World Internet Project) (2012)

b) Web 2.0

Although several studies account for gender differences or gender equity regarding Internet use, little have been focused on gender differences in the use of Web 2.0 resources in general. And when they mention gender differences it is usually an extra aspect, and not the main objective of their surveys. Others studies only focus on gender differences in specific applications of Web 2.0, such as online networks (Lenhart & Madden, 2007; Cuadrado-Garcia et al., 2010), weblogs (Carstensen,



2009; Lu & Hsiao, 2009; Lenhart & Madden, 2005; Herring, Kouper, Paolillo, Scheidt, Tyworth, Welsch, Wright & Ning, 2005), wikis (Herring et al., 2005; Cuadrado-Garcia et al., 2010), forums (Thayalan & Shanthy, 2011; Zhang, Dang & Chen, 2011) and chats (Wallace, 1999).

Gefen and Straub (1997: 3) referred that gender differences in interfaces revealed a small but growing body of research and that "men tend to focus discourse on hierarchy and independence, while women focus on intimacy and solidarity."

In 2000, still long before the emergence of Web 2.0, Weiser (2000) identified numerous gender differences in preferences for specific Internet applications. Males used the Internet mainly for purposes related to entertainment and leisure, whereas women used it primarily for interpersonal communication and educational assistance. This statement was later reinforced by Luckin, Logan, Clark, Graber, Oliver and Mee (2008), who verified that gender as well as age (school year) influence technology ownership and Web 2.0 activity. These authors verified that girls have higher webcam ownership than boys, while boys have significantly higher ownership of the Wii and PSP, by a ratio of nearly 2:1. However, there was no significant difference identified between boys and girls with respect to access to MP3 players, mobile phones or PDAs (Luckin et al., 2008: 21).

More recently, Ong and Lai (2006) and Chou and Tsai (2007) have stated that gender differences play an important role in understanding how people make their decisions about adopting a web resource, or not.

In order to identify more generic gender differences regarding the use of Web 2.0 resources, Adamus et al. (2009), analyzing e-learning courses, noticed that (i) women prefer to work in groups and care more for exercises that require communication and cooperation, whereas men tend to prefer working on their own; (ii) women also show a preference for well-structured tasks, playful experimenting (trial and error principle), which is in contrast with the way of learning preferred by men; (iii) women need more support, especially at the beginning of an e-learning course and they also need different ways of support than that provided to men; (iv) women tend to prefer online phone calls (synchronous), whereas men are mostly satisfied with support via e-mail (asynchronous); and (v) women prefer other and different approaches to new media and technology than men.



In an attempt to systematize the information gathered regarding each tool, we present the following list:

1) As to the use of online networks, Lenhart and Madden (2007) reported that 55% of teens use them, with 48% confirming that they visit these sites daily, and that 55% have created personal profiles. Older girls were said to predominate, using the sites mainly to reinforce pre-existing friendships, whereas boys were said to use the sites mainly for flirting and making new friends. Gender issues appear to make a difference in terms of older users, where 70% of older girls versus 54% of older boys used online social networking. Furthermore, Cuadrado-Garcia et al. (2010) mentioned that men need more help using the online software than their female classmates, while women find no problems when using the online technology.

2) Regarding weblogs from a gender perspective, Carstensen (2009) concluded that the percentage of female authors is much higher than that of male authors. Especially in the group of teenagers, girls form a much larger part. Lu and Hsiao (2009), after undertaking an empirical study involving 525 subjects, noticed that women's intention to own and maintain a weblog "was strongly influenced by self-expression while men's intention was strongly influenced by personal outcome expectations" (Lu & Hsiao, 2009: 135). Lenhart and Madden (2005) also reported that girls aged 15 to 17 were the most likely to blog (25% of girls versus 15% of boys) whereas boys were more likely to download music and video files. At the same time, Herring et al. (2005) stated that males post more comments and mentions in blogs than females and the male blogger makes more mentions of female bloggers than vice versa.

3) Considering wikis, Herring et al. (2005) indicated that gender, rather than topic, may condition differences in participation. In what concerns editing a wiki in particular, Antin, Yee, Cheshire and Nov (2011) conducted a study based on Wikipedia and found that male wiki editors drastically outnumber female editors overall and that females made far fewer revisions of the content made available by others, than males, however they made significant larger revisions than males. Regarding views of the content available on wikis, Cuadrado-Garcia et al. (2010) also detected differences between male and female students, as female students show higher resource and wiki views, as well as comments sent to the wiki and uploaded documents.

4) In what concerns online discussion forums Zhang, Dang and Chen (2011) observed that women and man have different writing styles and topics of interest. Girls contribute more words to the discussions in online forums than boys do (Prinsen, Volman & Terwel, 2007) and the number of active female students in online discussion forums is higher than males (Yukselturk, 2010).



5) Bearing in mind chats, several researchers have focused gender differences in chat rooms. Linguists in particular have shown that 'real-life' gender leaves traces online in the form of discourse styles and patterns (Rellstab, 2007), which reveals that discourse styles and patterns in chats differ between both genders. Women show more emotions, laughter and appreciation of others, while men make more evaluative judgments, and use more violent verbs (Rellstab, 2007). In what concerns gender preference and frequency of use, Li and Kirkup (2011) looking for gender differences in internet use in China and UK found that men in both countries were more likely than women to use email and "chat" rooms. Valentine, Marsh and Pattie (2005) also found that boys are more frequent users of chat rooms than girls.

Methodology

The literature review for this article focused on gender differences regarding the use of Internet, and more specifically, on the Web 2.0 tools.

Starting from the online reference system EBSCO, two main databases - Academic Search Complete and Eric - were used for the surveying of relevant articles that included peer-reviewed full texts. The selection of the articles for the literature review intended to be framed by the five-year period between 2007 and 2012. However, as the Web 2.0 concept emerged in 2004-2005, it was felt the need to search for articles prior to these years, in order to identify gender differences before and after the emergence of Web 2.0. After this first approach, other articles were surveyed in the Scopus online database.

The keywords used for querying the databases were combined using appropriate Boolean operators. Gender, gender studies, gender equity, gender differences, Web 2.0, Read Write Web and Internet, were the keywords initially selected. However, during the literature research we also felt the need to add a few more keywords, which consisted of proper Web 2.0 tools. The additional keywords used were: online network, blog, weblog, wiki, forum, online discussion forum and chat. This allowed for additional research and new findings on gender differences in use of specific Web 2.0 tools. After identifying the preliminary set of articles, their references were analyzed in order to identify additional quotations of interest. After reading the articles and retrieving relevant information, all the information gathered was cross-checked, in order to identify common trends.



Discussion and conclusion

Starting from our two research questions, *"Are there gender differences regarding the use of Web 2.0 resources?"* and *"What are the main differences reported in the literature?"* and after following a literature review of peer reviewed articles on the subject, we verified that gender equality/inequality regarding the use of Internet, and Web 2.0 resources in particular, is far from being fully understood.

Regarding the first research question, we've identified several gender differences described in literature as far as specific Web 2.0 tools are concerned. In an attempt to answer the second research question, we've identified gender differences in the use of online social networks, weblogs, wikis, online discussion forums and chats.

Online social networking attracts more girls than boys, which denotes women tendency to establish more social relations and to be more involved than men in communicative activities (Cuadrado-Garcia et al., 2010; Adamus et al., 2009).

Weblogs are described as having more female authors, but more male commentators. Women have always been more prone to write diaries than men and weblogs greatly resemble diaries in their functions. It could be that women replaced their traditional diaries by weblogs, which have as an advantageous feature the possibility to share the content with their teenager girlfriends.

Wikis, on the other hand, have more male editors, but more female viewers and commentators. This higher number of female commentators could be due to the fact that women see computers mainly as social media, which can make them be more involved than men in communicative activities (Cuadrado-Garcia et al., 2010).

In online discussion forums women write more and are more active than males. Still, this should be carefully interpreted, because as Zhang, Dang and Chen (2011) observed women and men have different topics of interest in online discussion forums. It is expected that if the topic explored in an online forum is more appealing to females, more females will participate in it and if the topic is more attractive to males, more males will participate in it. So, a further gender comparison should be made with a significant number of studies covering a wide range of topics.

Chats are more frequently used by males and the two genders have different discourse styles and patterns when chatting. Women demonstrate more emotions, laughter and appreciation of others, while men make more evaluative judgments,



and use more violent verbs (Rellstab, 2007). Such difference is attributed to women's tendency to prefer more communicative and cooperative activities (Adamus et al., 2009) and showing more openness for other's proposals and willingness to cooperate (Adamus et al., 2009; Cuadrado-Garcia et al., 2010). Men, on the other hand, are more competitive and are induced to have more initiative, due to the different socialization that they are under (Trigueiros et al., 2001).

The results obtained in this research are at this moment believed to be useful in providing important insights and guidelines for those who develop or make use of Web 2.0 tools with a social purpose, such as education. So, those who wish to "touch" the female audience should work on specific features of these tools, such as editing weblogs or commenting and giving feedback to others. Simultaneously, an increase in the number of male users could be achieved through the reinforcement of more competitive tasks online and the use of chats. These are issues to be taken into consideration in order to guarantee equal opportunities for both genders. Those who implement Web 2.0 tools will be more likely to reach their target population if they know the tools well, are aware of which features of each tool are most appealing and valued by each gender and customize those tools in a suitable manner to achieve their purposes.

This paper contributes to the research in the area of gender differences regarding the use of Web 2.0 tools, because it joints disperse information that relates to several tools. However, the continuous growth in the number of Web 2.0 tools, the rapid increase in the functionalities offered by them and the uncountable possibilities of exploration constitute limitations for any generalization. As the Web 2.0 is a constantly changing space, each particular situation reported in research papers could have different results if conducted differently, with other tools or with another audience (age group, nationality, academic background...).

The evidences here presented are not conclusive, since this attempt to systematize the main findings regarding gender differences in the use of Web 2.0 resources referred in the literature are scarce. To develop a more consistent contribution for future research it would be important for the sample of analyzed articles to be larger and complemented with the analysis of papers focusing on other Web 2.0 tools. This further research would empower and validate the findings of this study, pursuing the aim to understand more thoroughly the gender inequities that seem to exist regarding the use of Web 2.0 resources.



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We recognize that this research is not free of limitations and should be interpreted and accepted with caution. Attention needs to be paid when generalizing our findings to other societies. The majority of the articles analyzed refer to western societies, and gender is a social representation of sex, which varies from society to society. Therefore, this study would benefit from the development of further research on these same gender differences in other societies, such as the eastern.



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