Evolution of the Gender Research Agenda in the Senior Scholars Basket of Journals. A Literature Review.

Completed Research Paper

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ABSTRACT
This study is aimed at understanding, what gender-related challenges were recognized by scholars in the Information Systems field and how these challenges evolved over time. Based on a literature review of 22 papers published in the Senior Scholars Basket of Journals, which consider gender as core to their research, seven categories of challenges were identified. It is discussed, which studies and the related categories of challenges turned out to be scientifically demanded. It was found out that the category concerned with under-representation of women in Information Systems, which motivated the majority of articles under investigation, is not highly cited by other researchers. The paper contains a detailed description of the research method used, discussion of the results, as well as study limitations and propositions for future research.

Keywords (Required)
Gender, women and Information Systems, literature review.

INTRODUCTION
The Information Systems (IS) discipline is part of the STEM fields (Science, Technology, Engineering, and Mathematics), where the problem of women under-representation is particularly acute (e.g. She Figures, 2012; von Hellens, Trauth, and Fisher, 2012). At the same time, prominent scholars have argued that the topic of gender has not been a major focus in mainstream IS research (e.g. Trauth, 2011). This study is a first step in analyzing existing gender and IS research body of knowledge. It is aimed at identification and structuring the gender-related challenges raised by the scholars in the field. As a next step, the results achieved in the field will be investigated too and compared to these challenges. It will be then possible to conclude, which problems in the gender and IS field remain unsolved, what could be the ways to overcome them, as well as to propose a research agenda.

Thus, the goals of this study are to understand what gender-related challenges were recognized by IS scholars and how these challenges evolved over time.

The acknowledged leading journals in the IS field, namely the Senior Scholars Basket of Journals, were selected as the outlets under investigation. Hirschheim and Klein (2012) argue that the Basket of Journals recognize the diversity inherent in IS research through the rigorousness of the review process, the composition of the editorial board (members must be widely respected and recognized), and the existence of an international readership and contribution. The list of eight top journals in the IS field was formed and revised by the Association for Information Systems (AIS) Senior Scholar Consortium and includes the following:

1. European Journal of Information Systems (EJIS)
2. Information Systems Journal (ISJ)
3. Information Systems Research (ISR)
4. Journal of AIS (JAIS)
5. Journal of Information Technology (JIT)
7. Journal of Strategic Information Systems (JSIS)
8. MIS Quarterly (MISQ)
According to the goals of the study, the following research questions were addressed in the paper:

- What gender-related challenges motivated the research published in the Basket of Journals?
- How did the factors motivating gender-related research published in the Basket of Journals evolve over time?

The previous studies reviewing the gender in IS field concentrated mostly on the meta-analysis (research methodology, theory used etc.) and not so much on the content of papers (e.g. Adam, Howcroft, and Richardson, 2004; Trauth, 2011). Moreover, no comprehensive review of the challenges in the field could be found, which makes the current study of value for academia.

The paper starts with a detailed description of the research method used for selecting and analyzing the papers. Seven categories of gender-related challenges are described and discussed afterwards. Study limitations, future research, and conclusion are provided at the end of the paper.

**RESEARCH METHOD**

This study concentrates on reviewing relevant literature in accordance with the process discussed by Webster and Watson (2002).

**Selection of papers**

The range of outlets, which form the study scope, derived simultaneously with the identification of the study goals (Basket of Journals). Next, the paper selection criteria were identified. It was decided to search within the abstracts of all the papers published in the Basket of Journals at all times. Abstracts were chosen to be the only field of search, as they are supposed to contain all the keywords and represent the main ideas of the papers. Therefore, it was agreed that additional search in the papers’ titles (which are sometimes formulated in a sophisticated way with the use of terms, which might be misleading while search) and keywords (which should occur in abstracts) are not worth the effort. At the same time, as the set of journals in scope is not large, it was decided to invest time to perform the search directly on the websites of all eight journals and to not rely on journal databases, as they might be outdated or not contain certain issues. The publications were searched within the archives of all online issues until 2012 (see Table 1 for the years that were included for each journal).

Selecting keywords best representing the gender-related research turned out to be challenging and several iterations of search using different combinations of keywords were implemented. The EBSCOhost Business Searching Interface journal database was used to perform the test search, as all eight journals are presented there. As a result, it was decided to search for the papers having in their abstracts any of the following terms: gender, sex, female, women, feminin*. The wildcard search term feminin* stands for such notions as feminine, femininity, feminism, feminist, feminization etc. This set of keywords was critically discussed with several IS and gender researchers and they all approved it. Other terms, e.g. woman or girl, returned no additional results and, therefore, were not included. A search using masculinity-related terms, such as male, men, man, masculin*, returned only one additional paper on online dating for gay men (Light, 2007), which concentrated on the issues related to sexual minorities rather than to gender and, therefore, was is out of scope of current research.

The search was performed using the above-mentioned criteria and returned in total 66 results. Six papers, though, appeared to be not relevant for gender research (e.g. papers containing in their abstracts phrases like “23 men and 10 women took part in the survey”). Such papers were excluded immediately after reading their abstracts. The other 60 papers were carefully analyzed. In 33 of them gender was considered not as a main topic, but as just one of the factors (variables) alongside with e.g. age, income or education. E.g. the study of Trauth and Jessup (2000) is aimed at enhancing the understanding of computer-mediated discussions, and the discussions about gender equity in a university are used just as an exemplary case. Such papers do not fit the scope of this study fully and, therefore, were also excluded from further analysis. Moreover, five additional articles were omitted, as they contained no novel research (Non-Research Articles), i.e. were either review articles or editorials. The final selection of 22 papers from five journals satisfied the criteria of having gender as core to their research. The results are presented in Table 1. For the sake of consistency, the articles where gender is one of the factors were also divided into Research and Non-Research.
Results

In order to identify the level of scientific demand for each of the 22 selected papers, a forward search was performed using the world’s largest citation database Scopus. For each paper it could be found the amount of times it was cited. As the research published earlier had more time to be cited, it was decided to use the average number a paper was cited per year, assuming 2012 as the last year (quoting papers published in 2013 were not taken into account). The list of papers and an average number of times each of them was cited per year are presented in Table 2.

<table>
<thead>
<tr>
<th>Journal</th>
<th>Paper</th>
<th>Paper Nr.</th>
<th>Nr. of Times Cited</th>
<th>Avg. Times Cited per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>EJIS</td>
<td>Adam et al. (2006)</td>
<td>[P1]</td>
<td>19</td>
<td>2.71</td>
</tr>
<tr>
<td></td>
<td>Ahuja (2002)</td>
<td>[P2]</td>
<td>92</td>
<td>8.36</td>
</tr>
<tr>
<td></td>
<td>Trauth, Quesenberry, and Huang (2009)</td>
<td>[P5]</td>
<td>22</td>
<td>5.50</td>
</tr>
<tr>
<td>ISJ</td>
<td>Clayton, Beekhuyzen, and Nielsen (2012)</td>
<td>[P6]</td>
<td>1</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>Harvey (1997)</td>
<td>[P7]</td>
<td>8</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>Howcroft and Trauth (2008)</td>
<td>[P8]</td>
<td>12</td>
<td>2.40</td>
</tr>
<tr>
<td></td>
<td>Panteli (2012)</td>
<td>[P9]</td>
<td>1</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>Quesenberry and Trauth (2012)</td>
<td>[P10]</td>
<td>1</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>Ridley and Young (2012)</td>
<td>[P11]</td>
<td>1</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>Robertson, Newell, Swan, Mathiassen, and Bjerknes (2001)</td>
<td>[P12]</td>
<td>17</td>
<td>1.42</td>
</tr>
<tr>
<td>JIT</td>
<td>Adam (2002)</td>
<td>[P13]</td>
<td>16</td>
<td>1.45</td>
</tr>
<tr>
<td></td>
<td>Zahedi, Pelt, and Srite (2006)</td>
<td>[P17]</td>
<td>7</td>
<td>1.00</td>
</tr>
</tbody>
</table>
Table 2. The Papers Published in the Basket of Journals and Having Gender at the Core of Research together with the Results of the Forward Search for Them

<table>
<thead>
<tr>
<th>Journal</th>
<th>Authors and Years</th>
<th>P</th>
<th>Impact Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>MISQ</td>
<td>Gefen and Straub (1997)</td>
<td>P18</td>
<td>566</td>
</tr>
<tr>
<td></td>
<td>Igbaria and Baroudi (1995)</td>
<td>P19</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Riedl, Hubert, and Kenning (2010)</td>
<td>P20</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Truman and Baroudi (1994)</td>
<td>P21</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>Venkatesh and Morris (2000)</td>
<td>P22</td>
<td>806</td>
</tr>
</tbody>
</table>

As a final step, content of the papers was analyzed. According to the study goals, the information on the factors motivating the research, as identified by the papers’ authors, was extracted and investigated using the NVivo 10 software. First, the passages containing the authors’ explanations on what challenges persuaded them to perform the research were coded. Usually the study motivation became clear already after reading abstract and introduction sections of a paper. Second, the main ideas of the extracted passages were identified. It was noted that certain patterns existed and, therefore, assigning each passage to one or more categories was possible. Such process was performed several times, which revealed that there were several possible ways to group the discovered challenges. After careful evaluation of each scenario, the most representative final configuration of seven categories of gender and IS challenges emerged.

CATEGORIES OF CHALLENGES IN GENDER RESEARCH PUBLISHED IN THE BASKET OF JOURNALS

In this section the seven categories of gender-related challenges raised in the articles published in the Basket of Journals are described and analyzed. The challenges were identified in accordance with the studies motivation, as stated by their authors. Thus, only the research drivers from the perspective of the papers’ authors were analyzed (and not e.g. research findings, which might reveal existence of additional problems).

Category 1 - Under-representation and declining number of women in ICT education and work and need in addressing this challenge

The central problem stated by the authors of more than a half of the papers under study is gender imbalance in Information and Communication Technology (ICT) careers and educational programs. Most of the studies support their arguments with striking statistics on low number of women in ICT. Within the set of outlets chosen, Baroudi and Igbaria (1995) were first who emphasized that “women are, and continue to be, under-represented in the IS field”. Panteli et al. (1999) stressed that “although there has been an increase in the number of women entering ICT occupations since the seventies, women are under-represented in all member states of the European Union”. They explain this phenomenon and the overall “declining trend in the representation of women” by growing ICT industry on the one hand and declining number of respective female graduates on the other.

Ridley and Young (2012) point out that gender imbalance “limits the size and skill sets” of ICT employees, which, according to Ahuja (2002), also has a negative influence on the global competitiveness of companies. Therefore, it is vital to address this issue. Several authors call for the need to identify and understand the factors affecting women in ICT, as well as the reasons underlying their declining levels of participation within the field (Adam et al., 2006; Ahuja, 2002; Panteli et al., 1999; Robertson et al., 2001).

Adam et al. (2006) raise the problem of attracting women to the ICT industry and Reid et al. (2010) add that the retention of women who already entered the field is challenging as well. Panteli (2012) develops this aspect and says that women have an “interrupted pattern of employment” (due to e.g. career breaks caused by maternity leave) and that intervention programs supporting women returning to the ICT industry after a career break are needed. Intervention programs aimed at improving women’s position in ICT are also encouraged in the studies of Clayton et al. (2012), Quesenberry and Trauth (2012), and Ridley and Young (2012).

The dominance of men and the low number of women in the ICT field are also recognized in the studies of Wilson (2004) and Trauth et al. (2009).
Category 2 - Existence of factors and barriers affecting women's ICT career choice, persistence, advancement and overall experience

The second category of challenges contains the reasons causing the problem of female under-representation in ICT covered in the previous sub-section. The nine papers forming this category prove that women face barriers during entry, retention and advancement in the ICT profession, which makes them turning away from it.

All papers flag existence of gender stereotypes and discrimination in the ICT field. Baroudi and Igbaria (1995) assert that under-representation of women in ICT workforce is particularly acute “in positions of power and responsibility”. In their other study Igbaria and Baroudi (1995) state that women have “restricted career advancement prospects”, face “glass ceiling” and are evaluated less favorable in an ICT occupation. In both studies Baroudi and Igbaria forecast that the existing barriers faced by women together with the growing demand for ICT employees will lead to labor shortage in the future. As it will be shown in the third category, they appeared to be right.

Panteli et al. (1999) and Robertson et al. (2001) also call attention to the problems of gender discrimination in the ICT field referring to “gender segregation”, which means that managerial positions are held mostly by men who also get higher salaries than women. Studies of Truman and Baroudi (1994), Ahuja (2002), Reid et al. (2010), and Clayton et al. (2012) also agree that the pyramid structure of women’ presence and gender stereotypes prevail in ICT.

Harvey (1997) presents a different perspective on factors negatively affecting the representation of women in ICT. The main idea behind her study is that ICT culture is of masculine nature and ignores feminine voice. This concept is also mentioned as a motivation for the studies of Panteli et al. (1999), Robertson et al. (2001), Ahuja (2002), and Reid et al. (2010).

Category 3 - Labor and skills shortages in the ICT industry caused by, among others, under-representation of women

The third category of challenges is related to one of the consequences of female under-representation in ICT, namely the problem of labor and skills shortages in the industry. This challenge of meeting the demand for ICT professionals was raised in the studies of Panteli et al. (1999), Ahuja (2002), Trauth et al. (2009), and Quesenberry and Trauth (2012) together with the challenges from one or several other categories (Category 1 and/or 2 and/or 4).

Category 4 - Under-theorization of gender and ICT research

Theorization of gender and ICT research is supposed to help to better understand the issue of gender imbalance in ICT workforce and to guide interventions to overcome it. However, large under-theorization of this field has been recognized (Adam, 2002; Howcroft and Trauth, 2008; Wilson, 2004). Lack of empirical research on the factors and obstacles affecting women in the ICT field is acknowledged in the studies of Baroudi and Igbaria (1995), Igbaria and Baroudi (1995), and Ahuja (2002). Wilson (2004) also asserts that the feminist-inspired gender and IS projects were ignored by the IS mainstream. Adam et al. (2006) motivate their study by the under-researched area of gender identity of women working in the ICT field. Finally, Trauth et al. (2009) and Quesenberry and Trauth (2012) declare the need for greater theorizing of within-gender variation in factors influencing women in the ICT field, which is the most recent and the most comprehensive approach to theorize this issue (e.g. Panteli, 2012; Ridley and Young, 2012).

Category 5 - Lack of attention to the gender construct in the context of technology acceptance research

A very different category of challenges, which is not motivated by the low representation of women in ICT, deals with gender as a construct in the context of technology acceptance research, in particular, Technology Acceptance Model (TAM). The studies of Gefen and Straub (1997) and Venkatesh and Morris (2000) argue that there is a lack of gender-based work in TAM and other ICT diffusion research.

It is notable that the two papers forming this category received the highest number of citation (overall and per year). The finding that this category of challenges is the most demanded by other researchers was the reason for not merging it with the next category.

Category 6 - Need in understanding the difference between men and women in their decisions to trust online

The studies of both Awad and Ragowsky (2008) and Riedl et al. (2010) state the need in investigating the differences between men and women in their decisions to trust online as a motivation for their research.
The categories of challenges and related papers are summarized in Table 3 together with the sum of average times per year the papers comprising each category were cited. It is supposed that this number is related to the demand for the research raised in the identified groups of challenges. Several papers were motivated by more than one existing challenge and are presented in more than one category then (e.g. the paper of Ahuja (2002) raises the problems related to four categories). In order to increase the table readability, the papers are abbreviated to their numbers (see Table 2 for details).

All the challenges identified can be broadly divided into those having a feminist and critical orientation (inter-related Categories 1-4) and those on technology acceptance and technology-related behavior (Categories 5-7, all formed by unlinked studies). It is also worth mentioning that Categories 1-3 are all related to female under-representation in ICT.

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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 1 - Under-representation and declining number of women in ICT education and work and need in addressing this challenge</td>
<td>[P16]</td>
<td>[P3]</td>
<td>[P2]</td>
<td>[P11]</td>
<td>[P6]</td>
<td>12</td>
<td>29.11</td>
</tr>
<tr>
<td>Category 2 - Existence of factors and barriers affecting women’s ICT career choice, persistence, advancement and overall experience</td>
<td>[P16]</td>
<td>[P19]</td>
<td>[P3]</td>
<td>[P2]</td>
<td>[P4]</td>
<td>9</td>
<td>21.65</td>
</tr>
<tr>
<td>Category 3 - Labor and skills shortages in the ICT industry caused by, among others, under-representation of women</td>
<td>[P3]</td>
<td>[P2]</td>
<td>[P5]</td>
<td>[P10]</td>
<td></td>
<td>4</td>
<td>17.36</td>
</tr>
<tr>
<td>Category 4 - Under-theorization of gender and ICT research</td>
<td>[P16]</td>
<td>[P19]</td>
<td>[P2]</td>
<td>[P11]</td>
<td>[P10]</td>
<td>9</td>
<td>27.77</td>
</tr>
<tr>
<td>Category 5 - Lack of attention to the gender construct in the context of technology acceptance research</td>
<td>[P18]</td>
<td>[P22]</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>97.38</td>
</tr>
<tr>
<td>Category 6 - Need in understanding the difference between men and women in their decisions to trust online</td>
<td>[P15]</td>
<td>[P20]</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>16.20</td>
</tr>
<tr>
<td>Category 7 - Need in investigating cultural dimensions in Web sites, in particular, masculinity and femininity signifiers in Web documents</td>
<td>[P17]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Table 3. Categories of Challenges in Gender Research (from the Authors’ Perspective) Published in the Basket of Journals

**DISCUSSION**

The number of papers published in the *Basket of Journals* that have gender at the core of their research is relatively low in comparison to mainstream IS topics. At the same time, there are relevant gender and IS publications in non-Basket AIS journals (e.g. the special issue in Information Technology and People, 2002). And some authors even point out that they
deliberately publish their research in non-IS outlets which are more “gender-friendly” (Adam et al., 2004). This study confirms the proposition of Adam (2002) that lack of citation is one of the reasons, which prevents gender and IS research becoming mainstream. It is alarming that three out of eight journals have no papers with gender at the core at all. Therefore, it can be concluded that the topic of gender in IS is not mature enough to make a significant impact.

The publications under study were grouped according to the time period when they were published (four time slots having five years each and the fifth time slot containing most recent research published in 2011-2012). A very positive trend is that the number of publications is not decreasing and in 2012 alone four gender-related studies were published, which is more than within the five-year period from 1990 to 1995. At the same time, such a high amount of publications in 2012 was achieved due to a special issue of ISJ on Women and ICT (Volume 22, Issue 5), which gives a hope that gender as IS research topic will gain more attraction in the future. It is very exciting that the research on intervention programs aimed at increasing the representation of women in ICT finally got attention of the AIS community. This special issue makes ISJ the journal containing the highest amount of gender-related papers comparing to the other journals under study. Hopefully, this stream of research would become a new trend making this special ISJ issue its pioneer and not an exclusive representative in the top IS outlets.

The problem of under-representation of women in the ICT field is recognized by the majority of papers under analysis and the studies raising this topic were done continuously thorough all time. The related issues of discrimination and masculine culture of ICT also motivated researchers at all periods of time. The challenge of lack of professionals in the ICT industry was first raised in 1999 in the study of Panteli et al. However, the appearance of such a shortage was forecasted in 1995 already in the studies of Baroudi and Igbaria (1995) and Igbaria and Baroudi (1995).

Under-theorization of gender and ICT research was discussed in most periods of time, with an exception of the late 1990s, when theorization of gender was considered mostly in relation to technology acceptance theories. When comparing the demand from other researchers for these two categories of challenges, namely Categories 4 and 5, a very striking contrast in favor of technology acceptance research is traced. The TAM-related papers forming the Category 5 are cited significantly more than any other paper, which makes this category the most scientifically demanded, although only two papers are presented there. This result is alarming, as both papers focus on statistical gender difference studies employing a stereotypical essentialist approach, which considers men’s and women’s behavior as fixed and predetermined (e.g., Howcroft and Trauth, 2008). It is worth mentioning, though, that in 2012 both papers were cited significantly less than before, although still quite a lot. Time will show, whether such a decline becomes a trend and the interest in the technology acceptance research becomes more moderated. The lack of citation of gender and IS research, which has a feminist and critical orientation, supports the idea that gender and IS research is far from being mature (especially when compared to such mainstream topics as technology acceptance).

Overall, there is a clear trend in the switch of the research focus from investigating the low numbers of women in ICT to questioning the gender stereotypes and identifying complex relationship between gender and technology (e.g. Panteli, 2012). Nevertheless, unfortunately, both issues remain unsolved (e.g. Von Hellens et al., 2012).

LIMITATIONS AND FUTURE RESEARCH

The first limitation of the study is its scope. The gender research published in the Basket of Journals, although they have the highest impact in the IS field, cannot reflect all the endeavors in this area. According to Von Hellens et al. (2012), the history of gender and ICT research dates back to the early 1980s and comprises a range of specialized conferences and journals, which are subject to future research. The papers published in the outlets focused on gender and ICT research should be analyzed in terms of challenges addressed and contribution made. The results can be then compared to those presented in this paper. It is also planned to investigate gender research published in other IS journals and conferences. The relevant papers can be identified using the same research method, as described in this paper. With high probability the seven groups of challenges identified in this study would be generalized and extended when analyzing further papers.

Second, this study concentrates on the papers’ motivation as stated by their authors and not on the research itself and its contribution. It was done according to the goal of the study to identify the drivers, the challenges in gender and IS research, which motivated the papers’ authors. The current study is the first attempt to understand a range of problems in this field. In the future it is planned to also analyze the findings and the contribution of the 22 selected studies, as well as to investigate, whether the recommendations and propositions for future research stated in the papers published in the Basket of Journals were then addressed in other papers. It would be also interesting to study, whether some gender and IS topics are more likely to be published in the Basket of Journals than others. Another possible stream of research can deal with analysis of research strategies, epistemologies, as well as applied research methods and theories. It might be of high value to identify the gaps still existing in gender in IS research, as well as to formulate an updated research agenda.
CONCLUSION

This study is aimed at the analysis of challenges existing in gender and IS research, as identified by the authors of the relevant papers published in the Basket of Journals. Using the search criteria, described in the Research Method section, 22 papers having a topic of gender at the core of their research were identified. A range of challenges raised in each paper was thoroughly analyzed and grouped into seven categories. It was discussed, which papers under study (and the related categories of challenges) turned out to be the most demanded by other researchers based on the average number each paper (and the papers comprising each category) was cited per year. Finally, the evolution of the factors motivating gender and ICT research was examined.

It was found out that the main gender-related challenge, which motivated the majority of studies under investigation, is the under-representation of women in ICT education and work. This challenge is closely related to the problem of barriers women in ICT face. As a consequence, another challenge of labor shortage in ICT occurred and was mentioned as one of the drivers for four studies. Researchers attempted to tackle the main challenge of gender imbalance in ICT and, therefore, raised a problem of under-theorization of gender in the field as a motivating factor for their studies. The other categories of challenges identified do not involve significant amount of studies, although it was found out that the only two papers dealing with the problem of the lack of attention to the gender construct in the context of technology acceptance research were cited incomparably more often than papers forming any other category of challenges.

The current study is a first step in the analysis of gender research in the IS field and will be kept on using the same, as well as extended data sets.

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