

# Identifying and Removing Gender Barriers in Open Learning Communities: *The Programming Historian*

## Abstract

Open online learning communities are susceptible to gender barriers if not carefully constructed. Gender barriers were identified in *The Programming Historian*, through an open online discussion, which informed an anonymous user survey. The initial discussion pointed towards two barriers in particular: a technically challenging submission system and open peer review, as factors that needed consideration. Findings are put in context of the literature on gender and online communication, abuse, and online learning communities. The evidence suggests that open online learning communities such as *The Programming Historian* should work actively to promote a civil environment, and should listen to their communities about technical and social barriers to participation. Whenever possible, barriers should be removed entirely, but when that is not feasible due to financial or technical constraints, alternatives should be offered.

## Keywords:

gender; open learning communities; digital humanities; accessibility; peer review; technology

## Introduction

*The Programming Historian* is an open-access peer-reviewed publication of digital history methodology that accepts public submissions. Tutorial-style papers aim to provide historians with practical digital skills to directly aid their research processes. As such, it is a publication of methodology. As digital humanities is an interdisciplinary field, this subject-neutral space offers an important venue for sharing the 'how' of digital research. The project was initiated in 2011 by a group of scholars, which included the author.

Many authors use the tutorial-writing process as a space in which to master new methodologies, following the idea that there is no better way to learn than to teach. In keeping with the open ethos of the project, peer review is conducted openly on an online message board hosted by social coding website, *Github*. The editors hoped that this would increase the civility of peer review and foster an environment in which authors could hone skills in a supportive space. While all work is thoroughly reviewed, the editorial policy is always to work closely with authors to improve the work until it is publishable. This is distinct from the editor-as-gatekeeper model, and instead provides mentoring as needed. In this regard, the editorial board views *The Programming Historian* as both a scholarly publication and an open online learning community.

Until November 2015, the editorial board believed that the community was gender neutral, as the team had not consciously constructed gender barriers. However, a self-assessment revealed a different picture. Since launching in July 2012, the

project had published 45 tutorials by 30 different authors. Of those, only seven authors (23%) were women.

According to the Royal Historical Society's recent report on gender (2015), women make up nearly 40 per cent of academic staff in British university history departments, and a slight majority of A-level history students. This suggests that the gender imbalance of *Programming Historian* authors is unrepresentative of the potential authorship pool. As this had been unintentional, the editorial board solicited feedback from the digital humanities community in an attempt to identify invisible barriers so that they could be addressed. Building on Kirk *et al* (2013), who concluded that 'awareness is the first step towards action' when seeking to remove barriers to participation, this paper shares the findings of that assessment for the benefit of other open online learning communities.

## Literature Review

Studies of women in online education often focus on the formal university online classroom rather than open communities. However, there are useful parallels because of the asynchronous web-based communication common to both. As such there are also fruitful connections to be made with research into gender and online communication. It is worth noting that studies can sometimes perpetuate gender stereotypes, and a belief that gender is binary: male / female. Remmele and Holthaus (2013) challenge the inherent inflexibility of this approach to understanding gender. Instead they believe we should think of gender as something we *do* rather than something we *are*. They argue that our misunderstanding may lead to gender stereotypes, such as the belief that men are better at working with technology.

Stereotypes in research are particularly important to understand in studies conducted outside one's own cultural context. For example, studies from countries in which women are still assumed to be the primary care giver can give a skewed view. These studies often tout the flexibility of asynchronous online education, making it possible for women to balance family, work, and study needs. These include studies from Turkey (Yukselturk & Bulut, 2009) and Mauritius (Gokool-Ramdoo, 2005), but also the United States (Eudey, 2012).

There are clearly situations in which women are affected differently than men in an online communication environment, which includes communities like *The Programming Historian*. Herring (2000) rejects the idea that online environments are gender neutral. Her analysis of online bullying and harassment (1999) showed that women in early socially-focused chat rooms were routinely subjected to abuse tactics by men. She noted that men in a chat room frequented by English-speakers of Indian descent felt that women's role in chat rooms was to flirt, and if they refused to do so, they were quickly subjected to *ad hominem* attacks. She noted that the men frequently asserted their opinions as 'fact', and often reverted to sexually explicit or crude language (Herring 1992, 1993, 1996). However the problem was not unique to Asian men; even in more academically focused online spaces of predominantly Canadian and American scholars, Herring (1999) found that women were expected to provide 'minimal participation, in keeping with the traditional expectation that public debate is predominantly a male preserve'. Several other

studies confirm this, including Rovai (2001) and Chan *et al.*, (2013), who found that men were much more likely than women to adopt an assertive online tone, in contrast to a more supportive and helpful approach by women. Rovai and Baker (2005) believe this comes down to different strategies in an online space. They argue that women seek to establish intimacy, whereas men often seek to establish a hierarchy. However, a study by Ma and Yuen (2011) showed the opposite was true in Hong Kong, and thus this finding may be culturally specific.

Online abuse is particularly pertinent to thinking about open peer review, which is used at *The Programming Historian*. Peer review involves a power relationship between reviewer and author, and if women are more likely to fear online abuse, the model may be a gender barrier. McSporrán and Young (2001) warned that it was important for educators to prevent a 'locker room atmosphere' in an online learning environment, and that building 'people-friendly' spaces was a fundamental first step in building an online learning community. In the context of the *Programming Historian*, the 'educator' would be the 'editor' – the person in charge of the environment. This role of educator as moderator is an important theme in the literature. Burge (1998) warned that educators must watch for 'male domination of discussion'. According to Herring (2000), women tend to prefer policed online environments that ensure on-going civility, and are more likely to fall silent or drop out of conversations when faced with aggression. Browne (2003) argued that it was crucial for students to trust their tutors in an online environment, and that it took time to build that relationship to the point where a community of learning could establish.

There are of course parallels in other industries; Hughes and Smail (2015) noted that students transitioning to university were most worried about the social aspects of joining the community rather than worries about their academic abilities. As a number of *The Programming Historian's* authors are relatively new to academic publishing, the parallels are even greater. Physical spaces (university campuses) and online spaces (digital journals) may look different, but the social requirements of participating in both are very similar. In many respects the online space may be more challenging, as there are rarely opportunities to gauge body language or other non-verbal cues when all communication occurs in writing. Thus, those building online learning communities should also keep in mind these fears about social barriers in unfamiliar spaces.

Importantly, the gender of the educator appears not to be significant as long as they are trusted and maintain civility and focus (Rovai and Baker 2005). Torrens (2007) believes that online models of learning achieve their greatest potential when they become collaborative places to construct knowledge rather than platforms for the transmission of ideas from expert to student. This position is supported by Rovai and Wighting (2005). This suggests great potential for open peer review if the other challenges can be overcome. Eudey argues that 'constructivist' approaches to online pedagogy were most effective, such as those described by Rudestam and Schoenholtz-Read, as well as Sherman and Hurshan, which de-emphasised the instructor as the 'transmitter of knowledge' and instead promoted student-centred learning (Eudey, 2012).

If policed effectively, an online learning environment has several advantages over an in-person classroom. Online environments typically offer asynchronous communication, and thus remove the immediate pressure of seminar discussions. Lin and Overbaugh (2009) noted that in blended classrooms (online & offline), two-thirds of participants engaged in online activities preferred asynchronous modes of communication to immediate communication methods such as messaging systems. This was true regardless of gender. Browne (2003) notes that this allows for greater chances for reflection and careful construction of a contribution. Ma and Yuen (2011) as well as Little-Wiles *et al* (2014) noted that women expressed themselves more frequently in online environments than in face-to-face courses, which they argued may have been influenced by the chance to reflect before making a contribution. If true the previous research suggests great potential for a well-policed system of open review.

## Methodology

To understand the extent of gender barriers in *The Programming Historian*, the editorial board solicited two forms of feedback from members of the digital humanities community.

The first was an open call for suggestions on the project's online discussion forum, hosted on *Github.com*. *Github* is a popular online social coding platform used by software developers, which offers collaborative spaces to discuss and build digital projects. Asynchronous message board facilities are built into the site. *The Programming Historian* website is developed on *Github* so it was a natural place to host the discussion. This open conversation attracted ideas from 25 people (14 women and 11 men) who contributed a total of 58 comments. As these comments were posted on an open forum, the identity of contributors is clear, and includes many members of *The Programming Historian*'s editorial board and prominent members of the digital humanities community. The author initiated the thread and was amongst the contributors to the discussion.

Insider research is potentially problematic from an objectivity point of view, as he or she may have a vested interest in covering up findings that prove threatening to the ongoing survival of the project under review (Taylor, 2011; Humphrey, 2012). However, as Foster (2009) notes, insiders have advantages, as they may bring greater motivation and a particularly relevant set of experiences to the research that is not available to outsiders. To mitigate the potential risks of insider bias by the author, the initial open consultation described above was used primarily as a scoping exercise to inform the second stage of the self-assessment.

The second stage was an anonymous survey, developed with the help of Heather Froehlich, a community participant. Initial comments in the open conversation made it clear that the choice of venue (*Github*) was a gender-barrier, as *Github* is associated with male geek coding culture. To contribute, someone had to sign up for or already have a *Github* account. They must also be comfortable with the forum, which has a design and social norms that may be intimidating.

The survey was an attempt to focus the conversation and provide a more accessible way to participate. It required no registration and removed many of the pressures

of posting in public. The anonymous survey, which can be read in full in Appendix A, received 47 responses (49% women). These included questions on demographics; self-assessment of one's technical skills, as well as familiarity with the project; open ended questions about particular aspects of the project highlighted as barriers in the open discussion; and an opportunity to provide additional suggestions. While the questions about barriers identified in the open discussion are undoubtedly leading, they were included to focus the discussion in ways that the project team felt would lead to practical suggestions.

The ten-question survey took approximately ten minutes to complete. All questions were optional and most questions had a response rate of >75%, with lower response rates on free-form questions 8 and 9 (Appendix A).

In both the open forum discussion and the anonymous survey, the participants were self-selecting. The survey was advertised via the project website, the discussion board, and through Twitter.

## **Findings & Discussion**

In general, responses on the open discussion board suggested a wider gulf between men and women than did the anonymous survey. This suggests that women who posted their thoughts publicly may represent an outspoken or confident minority, and may not reflect the breadth of concerns of the wider community. That is not to suggest that those open contributions should not be taken as seriously as the anonymous responses, but merely that the format of the open discussion may have resulted in some potential participants thinking again before sharing ideas. As the open discussion occurred on an asynchronous open message board, early respondents had the opportunity to direct the conversation.

The early posts largely put forth concerns of parents trying to balance work and service commitments. A number of self-identified mothers suggested that they were too busy with child-minding to contribute more actively to online learning communities. While this is undoubtedly an important concern, not all women were comfortable with the stereotype this risked perpetuating. One female contributor acknowledged that 'it is currently more likely that a child's primary caregiver will be a woman, but I don't know that further gendering the role is helpful'. This disagreement connects well to Remmele and Holthaus (2013) and their warnings about presenting cultural gender roles as gender characteristics. The conversation also suggests that a future study might require differentiation between the needs of parents and non-parents to determine barriers that affect each group.

Busyness was also suggested as a barrier for female digital humanists with strong technical skills. A number of these women said they received frequent requests to contribute, as every project seeks female team members. Limited supply means these women can be stretched too thin. However, this may not be a gender problem. One contributor acknowledged the problem of over-commitment, but suggested that she saw 'no particular evidence' that these women were busier than their male colleagues.

While no consensus was reached amongst participants of the open discussion, a number of themes emerged which informed the development of the anonymous survey. The original intention of the open discussion was to identify problem areas with the project, so following up on these emerging themes helped the editorial board focus the contributions of the subsequent consultation towards practical suggestions that could make a clear difference to the project.

Those suggestions included (but are not limited to):

- 1) The submission system for authors was too technically challenging.
- 2) The project's policy of open peer review may raise fears of online abuse.
- 3) The ratio of men to women on the editorial board may deter women.
- 4) The option of mentoring for authors may encourage more submissions.
- 5) Encouraging co-authorship for women with ideas but not enough time may increase participation.

These themes informed the survey, which for reasons of time and the need for focus, concentrated on understanding the first two issues.

### The Submission System

*The Programming Historian* has no active budget, so uses free open tools to run the website and message boards. At the time of the survey, potential contributors of a tutorial had to write their submission in a format known as 'markdown', which uses symbols to denote parts of the text. For example, instead of using the formatting features in *Microsoft Word* to create a section header, you would write:

```
#This is my header
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There are similar formatting options for creating links, bold, italics, underline, lists, and other common styles used in tutorial writing. This format is designed by computer scientists to be sustainable as no proprietary software is needed. It is intended to be both human and machine-readable (once you learn to ignore the symbols).

Submissions were uploaded using what's known as a *Github* 'pull request', which involves using your computer's command line to send files to the project website for review. This requires an understanding of 'pull requests', which is common amongst computer programmers but unusual amongst digital humanities scholars.

The editorial board acknowledged that this was not the most intuitive system, but it was free, and the editors hoped that detailed instructions would prevent it from becoming a significant barrier. While the survey suggested that many users, both male and female, were supportive of the use of *Github* and markdown for submissions, and understood the economics behind the decision, the community was divided on this use of technology. One male contributor implied that the system was a good way of ensuring only *real* digital humanities scholars were submitting lessons, noting: 'Lovely vetting process. You must be this tall to ride the ride'. However, a number of men and women strongly expressed their dislike for

the option; women were more likely to be lukewarm or openly disdainful, suggesting that this was a significant barrier.

A number of female respondents noted it was 'very inaccessible', that 'I can see the intimidation factor' and that they 'really don't have time to learn another format'. However, men too expressed their dislike for the system, one of whom noted, 'That's terrifying to me'.

One reason for this gender-disparity may be that the women who contributed to the survey, self-assessed their awareness of markdown significantly lower than male contributors (less than half of 21 women were able to 'describe markdown casually to a friend' versus 65 per cent of men) Markdown stood out as distinctly male amongst self-assessed skills. Women declared themselves more familiar in most categories, including HTML and CSS (women: 95%; men: 71%), and XML (women: 67%; men: 47%). Surprisingly, markdown is similar to HTML and XML, so the leap between them should not be far for new learners, but the barrier persists.

A number of respondents suggested clearer documentation and guidelines for the process would help, as well as the option to use another system. The clear response from reviewers was enough for the editorial board to begin exploring other submission options. Other digital humanities projects using *Github* or markdown should consider how they might pose obstacles for potential contributors.

### Open Peer Review

Openness is an important tenet adopted by many digital humanities projects. *The Programming Historian* is an open-access publisher, requires tools and techniques to use open access software whenever possible, and practices open peer review. This last policy was adopted to promote civility in the peer review process. Many academics will have experience with *ad hominem* reviewer comments from anonymous peer reviewers, and this has led to a number of journals experimenting with open review to promote civility, as long as the online learning community is well-policed by editors (Burge, 1998; Herring, 2000; McSporran & Young, 2001; Browne, 2003; Rovai & Baker, 2005).

Peer review itself is of course not a gender neutral process, but the research suggests that anonymous peer reviewing may put women at an advantage over men. Perhaps surprisingly, research by Lloyd (1990) showed that anonymous female reviewers were considerably more likely to favour female authors, accepting 62 per cent of their submissions compared to only 10 per cent by male authors. Men on the other hand, did not gender discriminate in the study. This finding was supported by Borsuk *et al* (2009), who showed that female postdoctoral researchers were the most critical referees in peer review.

However, open review may not be the most preferred gender-neutral alternative. A 2001 study by Melero and López-Santoveña found that 75 per cent of reviewers were in favour of the anonymous option, perhaps in the belief that it protected reviewers and gave them the option of honesty without fear of repercussion. As noted in the literature review, many women have had negative experiences with open online communication, and thus may be hesitant to participate in this form of

review. Some members of the community may be concerned about 'making mistakes out in the open', particularly as these comments could be used to judge someone's scholarly prospects (Herring 1992, 1993, 1996, 1999; Rovai, 2001; Chan *et al.*, 2013).

Despite potential pitfalls, in this study both men and women were overwhelmingly positive about open peer review (29 like, 6 neutral, 3 dislike, 9 skipped – no gender difference), with the caveat that moderating by an editor who stepped in to prevent 'nastiness' was crucial to a successful system of open peer review. One female respondent noted: 'I \*love\* review systems where civility is prioritised', while another noted that open review would increase her likelihood of contributing because 'double-blind can result in (sometimes not fully intended) abuse'.

Though a few participants suggested the gender imbalance of the editorial board was important (at the time: 4 male, 2 female), interestingly male respondents raised this concern as often as women, and in both cases it was rare. This lack of widespread concern about the gender of editors supports the findings of Rovai and Baker (2005), who noted that civility was more important than gender.

Despite overwhelming support for open review, some respondents suggested that there were legitimate reasons why some authors would want an alternative option such as double-blind review or closed review, and that online learning communities that involve peer review should consider offering this option.

## **Conclusion**

The number of respondents (24 in the open discussion and 47 in the survey) was modest relative to the site's hundreds of thousands of readers, but is proportionate to the size of the active community that participates in the project through peer review, authorship, or by contributing to the site's message boards, whose numbers typically include a few dozen scholars at any given time. The quality of the responses was high and provided thoughtful considerations of a project with a wide user base. The results of this open discussion and survey provided useful insights into the needs of women in open online learning communities. This was particularly the case as those needs related to technical (a complicated submission system) and social (open peer review) barriers.

The study found that technical barriers such as the submission system should be replaced when technically and financially possible. When this is not feasible, alternative options should be offered that lower the barrier, and if necessary, that shift any burden onto project leaders rather than community members. The findings support the conclusions of Eudey (2012) in particular, that platforms must be developed with the needs of users, not community managers, in mind.

Despite some respondents expressing concern about the open peer review system, overwhelmingly the community was in favour as long as civility was a priority. This reinforces claims by a number of previous studies including McSparran and Young (2001) about the importance of community leaders maintaining standards of civility to combat historically grounded fears of abuse. However, this finding challenges earlier work by Melero and López-Santoveña (2001) that reviewers prefer



anonymity, suggesting that in the digital humanities community, a carefully managed open peer review is welcome and that the gender barrier can be overcome.

Finally, the open discussion in particular made it clear that many people have concerns that are connected to the challenges of motherhood and the pressures it poses upon time available for scholarly activity. However, as some participants pointed out, these are concerns that do not only affect women, and do not affect all women. Therefore, future studies should seek to understand the unique needs of people with caring responsibilities.

While women did identify a number of barriers to their further participation in *The Programming Historian*, the findings of this study suggest that these barriers were generally not gender-specific. This suggests that practices that are good for women may also be good for men, promoting the importance of best practices in open online learning communities.

Perhaps most notably, this study has shown that one of the best ways to identify gender-barriers in online learning communities, is simply to ask your community members.

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## Appendix A Anonymous Survey Questions

1. Which of the following ways have you engaged with *The Programming Historian* (check all that apply)

- As a reader to learn a new skill
- As a peer reviewer
- As an editor
- As an author
- As an educator, facilitating the learning of others
- None of the above
- Other (please specify)

2. Which ways would you be interested in contributing to *The Programming Historian*?

- As a reader to learn a new skill
- As a peer reviewer
- As an editor
- As an author
- As an educator, facilitating the learning of others
- None of the above
- Other (please specify)

3. On a scale of 1 (novice) to 6 (advanced), how would you rate your confidence with technology?

4. Please select which if any skills you have well enough to describe casually to a friend

- Command Line
- Markdown
- Git / Version Control
- XML
- HTML / CSS
- Programming Language (eg. Python, R, etc)
- Scholarly tool use (eg, topic modelling, GIS)
- Other (please specify)

5. Do you consider contributions to *The Programming Historian* a form of academic publication? Please tell us why or why not.

6. *The Programming Historian* asks contributing authors to submit their lessons in 'markdown format' and to make submissions via a 'Github Pull Request'. As an unfunded project, this free workflow allows us to minimise costs and editor time. Do you have any comments on this submission workflow and its accessibility?

7. *The Programming Historian* uses an open review process, in which both the reviewers and authors post publicly during the review and editing phase. It is our hope that this openness maintains civility between all parties, which is often lost in double-blind reviews. Thinking about your own feelings about open online conversations, would this policy increase or decrease your enthusiasm to submit a tutorial? Why?

8. If you had to make one change to *The Programming Historian* to make it more accessible and open, what would it be?

9. Is there anything we missed in this survey? Please tell us and give a suggestion about how to account for it.

10. Which best describes how you identify your gender?

- male
- female
- none of the above
- I prefer not to say