The GenderMag-Teach Project*

Margaret Burnett
Oregon State University
Corvallis, Oregon, USA
burnett@oregonstate.edu

Zoe Steine-Hanson
Oregon State University
Corvallis, Oregon, USA
steinehz@oregonstate.edu

Alannah Oleson
University of Washington
Seattle, Washington, USA
olesona@uw.edu

ABSTRACT
The GenderMag-Teach project is a new and developing online community of practice for educators who are teaching the GenderMag method. GenderMag is an HCI method for gender-inclusive software design. In this paper, we share our community-of-practice approach and its core attributes.

KEYWORDS
HCI design and evaluation methods; Inclusive design; HCI education; GenderMag

INTRODUCTION
In the summer of 2017, a group of us GenderMag researchers decided to look into how to support university faculty members interested in teaching GenderMag [3]. We call the resulting work we are doing to support a community of practice for such faculty the GenderMag-Teach Project.

Our goals had some similarities to the goals behind the 2019 EduCHI Symposium, but are more modest—we aimed only to help faculty teach concepts and practices relating to GenderMag, not all of HCI. Even so, we hope our work in this direction can help to inform and contribute to the design of more ambitious projects to support HCI education.

WHAT IS GENDERMAG?

GenderMag (gendermag.org), short for “Gender Inclusiveness Magnifier”, is an inclusive design and evaluation method [3, 9]. It integrates a specialized cognitive walkthrough (Figure 1) with research-based personas (Figure 2) that capture individual differences in how people problem-solve and use software features—differences that statistically cluster by gender. GenderMag has been used to find gender biases in several commercial and open source software products (e.g., [1, 2, 4, 5, 7, 9]).
GUIDING INFLUENCES

Our approach to supporting educators interested in teaching GenderMag was inspired by three main influences: (1) some things we’ve learned from practices of pre-college teachers; (2) the National Center for Women & IT’s (NCWIT) approach to “resources in a box”; and (3) work on Pedagogical Content Knowledge (PCK).

First, in past collaborations and conversations with people knowledgeable about pre-college teaching, we realized how constrained pre-college educators’ time can be: pre-college educators are in the classroom almost all day, with very few hours left for preparation, so enabling them to bring new content into their classes tends to require highly practical supports. For example, some school systems purchase or develop entire curricula to support their teachers; see https://bit.ly/2l03gdR for one example. Such curricula can include syllabi, modular presentation materials, exercises, test questions, and so on. Without supports like these, many pre-college educators would not be able to afford the time to incorporate content they had not previously taught.

College educators, too, have many constraints on class development time. Thus, we decided that they too might benefit from modular presentation materials, exercises, test questions, etc., like those used in supporting their pre-college counterparts.

In deciding where such materials should come from and how to packaged them, we drew ideas from our second inspiration source, NCWIT (the National Center for Women & IT; http://ncwit.org). NCWIT’s resources have attributes that we adopted as core attributes for our approach. First, the NCWIT resources are highly modular, and are in types of packaging that are usually reusable and customizable; second, they are all together in one place; and third, they are mostly co-created by members of the NCWIT community. The NCWIT approach guided us to provide the resources we already had for educators all together in one place too, in customizable form, and to encourage our community members to share back to the community any materials they developed.

However, teaching new content requires more than materials, more than knowledge of the content, and more than knowledge of how to teach. It also requires knowledge of how to teach this content. This knowledge is called Pedagogic Content Knowledge (PCK) [8], which was the third main influence on our work. PCK is a common topic in pre-college education communities, but has made only modest inroads into conversations about college-level CS or HCI education. We viewed good support for PCK on how to teach a nuanced topic like gender-inclusive software as critical, so we placed an emphasis on understanding and sharing PCK units on how to teach GenderMag.

THE GENDERMAG-TEACH COMMUNITY Wiki

To facilitate sharing, we created a wiki (Figure 3) and invited nine faculty members across eight universities who had expressed interest in teaching aspects of GenderMag to contribute to it. The wiki consists of three types of resources: (1) community-building mechanisms, (2) modularized, customizable teaching materials, and (3) teaching guidance (PCK and other materials).
The community-building mechanisms are the wiki structure itself, a discussion group (via Google Groups), and a page listing universities who have told us they are using the materials (Figure 4) to help educators realize that they are part of a community.

The modularized teaching materials are small modules, with the idea that a faculty member might want to teach the full method, or only the GenderMag personas, only its specialized cognitive walkthrough, or other bits and pieces of GenderMag. Among the teaching materials are slide decks with lecture modules on various portions of the GenderMag method, sample homework assignments that scaffold practicing GenderMag walkthroughs on example websites, suggested readings, in-class activities such as an interactive GenderMag walkthrough activity to be done in class, the current version of the GenderMag kit (http://gendermag.org), and test questions. We built some of the materials ourselves; the rest were contributed over time by faculty members in the PCK study we undertook [6] and by other teachers who have taught GenderMag.

The teaching guidance is of two types. The first is guidance on where GenderMag concepts can fit in a curriculum, and how it might further particular types of course goals. (These are in the “Why Teach/What Skills” section and the “How to Teach” section of the wiki; see Figure 3.) The second is a set of Pedagogical Content Knowledge (PCK) units—teaching tips and pitfalls contributed by the nine faculty who worked with the materials in their classes as part of an Action Research investigation we conducted in Fall 2017 through Spring of 2018 [6]. The community wiki shares the PCK units derived from that investigation, listing each unit and an example for the classroom. Table 1 summarizes the PCK.

Table 1: A summary of the PCK units [6] (tips and pitfalls for educators) from the GenderMag-Teach community wiki. (Table continued next page.)

<table>
<thead>
<tr>
<th>PCK</th>
<th>Example for the classroom</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PCK1-Framing</strong></td>
<td>Educator: “When I finally do present GenderMag, which is probably about a month from now, the students will be so used to Abi and her facets, ... they’re just going to be really bought into it at that point.”</td>
</tr>
<tr>
<td><strong>PCK2-Credibility</strong></td>
<td>Educator: “It was really helpful to assign the ... paper... because students ... really understood why I am using this.”</td>
</tr>
<tr>
<td><strong>PCK3-ContentKnowledge</strong></td>
<td>Educator: “I thought those five facets were orthogonal ... but as I explained to students, they are very related.”</td>
</tr>
<tr>
<td><strong>PCK4-Concretization</strong></td>
<td>&lt;Educator&gt; began describing the Motivations facet by naming it and then reframing it as “Why is the persona sitting in this chair [in front of the computer with this software]?”</td>
</tr>
</tbody>
</table>
| **PCK5-Modeling**        | Student: “Can we use subgoal or the scenario when ...”          
Educator: “Yes you can reference both if ...”          
Student: “So is the ‘right thing’ the action? ...”          
Educator: “Yes, it is what <student> defined to us as the action.” |
Table 1 (cont.): GenderMag-Teach PCK units.

<table>
<thead>
<tr>
<th>PCK6-TheoryOfMind: Coaching students to see software through the eyes of a persona.</th>
<th>Educator: “Some students seem to have no problem just slipping right into that mindset of ...I’m going to speculate from her perspective’...But there are still students that don’t.”</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCK7-Averting“I”: Listening for uses of “I” during in-class activities and prompting students to use the personas’ names can reduce use of “I” methodology and increase perspective-taking.</td>
<td>Educator: “I’ll remind them of the rules, such as they’re never allowed to say “I” or “you” or “the user,” they have to say Abi ... or Tim [a GenderMag persona].”</td>
</tr>
<tr>
<td>PCK8-Engagement: Tasking students to modify non-essential parts of ... materials, such as background information, can increase engagement ...</td>
<td>One team modified one of the personas, turning her into “Jenn.”</td>
</tr>
<tr>
<td></td>
<td>Part of the backstory they devised for her was:</td>
</tr>
<tr>
<td></td>
<td>Student: “Jenn needs to find housing for her 18 years old son who is deaf and transferring to &lt;University&gt;.”</td>
</tr>
<tr>
<td>PCK9-RefutingStereotypes: Pointing students to the evidence... can help students connect their work to foundations rather than stereotypes.</td>
<td>Educator: “This [pattern of data] holds strongest for male versus female developers. Why do you think ...?”</td>
</tr>
<tr>
<td></td>
<td>Student: “Women ... don’t like technology.”</td>
</tr>
<tr>
<td>PCK10-ReducingStereotypes: Having students perform the inclusive design process can reduce tendencies to stereotype members of populations unlike themselves.</td>
<td>A prior study investigating stereotyping in the presence of the GenderMag method, found that groups that performed a GenderMag walkthrough gender-stereotyped personas less than those who did not do a walkthrough and less than people do on average [6].</td>
</tr>
<tr>
<td>PCK11-HandlingResistance: Relating inclusive design methods’ utility to the broader goal of inclusive appeal and/or to greater market share can... motivate them...</td>
<td>Educator: “They like the idea that we have to design software for everyone... if only half the market wants to buy your software, that’s not going to be a very successful product.”</td>
</tr>
</tbody>
</table>

CONCLUDING REMARKS

The GenderMag-Teach project is young, but our results so far are encouraging. In the 1.5 years since we began, about 20 universities have begun to teach aspects of GenderMag using the materials on our community wiki, and some community members have also contributed materials, data, or PCK insights to the effort. We are continuing to improve and expand upon the project. We also hope that our experiences and our community can contribute to other efforts to build communities of practice to support Global HCI Education.

ACKNOWLEDGMENTS

We thank our collaborators in the GenderMag-Teach PCK investigation, which had numerous impacts on the community wiki, especially Andrew Ko and Christopher Mendez, who made key contributions to that investigation. This work was partially supported by NSF Grant 1528061 and by Alannah Oleson’s NSF Graduate Fellowship.
REFERENCES


