How Gender Differences Matter in Software Training (Aug 11)

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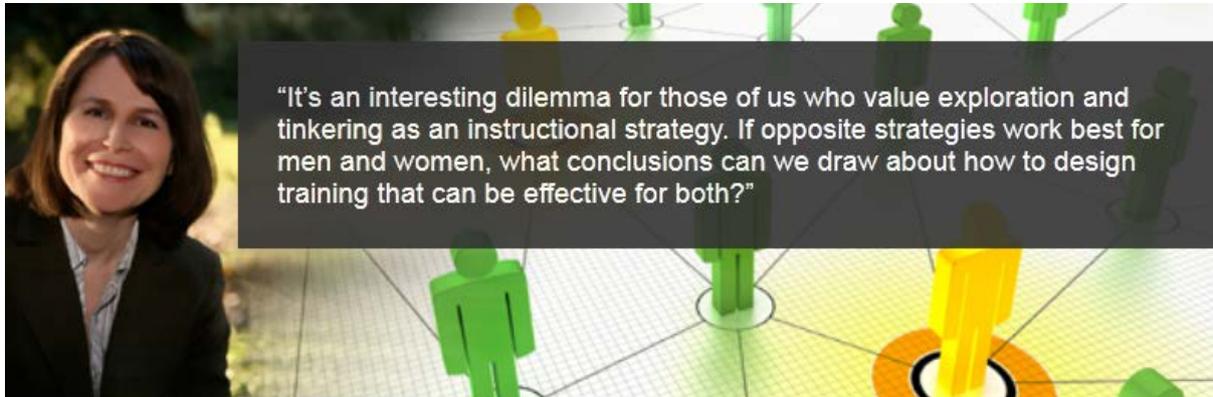
Software trainers, take note. Men and women really do interact with software differently, and the differences in their approaches have implications for how to design effective training.

Often, new software is released with the underlying assumption that users will be curious enough to explore the new features that seem relevant to the tasks they perform. In the best of circumstances, it's a hit-and-miss strategy. But a recent research article published in *Interacting with Computers* suggests that it also, on average, works against the ways women are most likely to use software to solve problems.

There isn't room in a short article to describe the details of all the experiments described in the article, but for anyone curious about the details of the research methods and the experiments, I cite the source at the end of this column.

The experiment

To explore how men and women solve problems with software, researchers developed a set of spreadsheets that included errors. They asked groups of men and women to take a tutorial, and then use a software package to test and remove the errors. The tutorial covered formula editing, a topic likely to be familiar to the audience. It also taught new features (checkmarks and arrows), and mentioned one other new feature (x marks) that it did not teach.

The first set of results was predictable. When completing the task, women were more likely to rely on familiar features, whereas men were more likely to use the new features taught them or that were simply mentioned in the tutorial. Women who did use the new features were likely to have self-reported that they were confident in their ability to perform the task before starting.

Tinkering

In another fairly predictable result, men were more willing to tinker with and explore the spreadsheets than women, but this is where the results get interesting.

Tinkering with the spreadsheets seems to be a reasonable approach to working with a new problem, in line with generating and testing alternative strategies to find a solution. In other words, learning. Women who tinkered with the spreadsheets seemed to be doing just that, and, for them, tinkering predicted more effective problem solving. Counter-intuitively, though, when men tinkered with the spreadsheet, they were *less* effective in correcting the errors. The opposite results seem attributable to the fact that women paused before trying something else, long enough to process the information.

In a later version of the experiment, they added more support to the environment. They offered users extended tool tips that reported the current state of the spreadsheet, and suggested possible strategies. They could also use a "Help Me Test" feature to get recommendations on test inputs.

When they added more support to the software environment, men tinkered with the spreadsheet less, which improved their problem-solving performance. Women in this experiment were more likely to tinker with the spreadsheets, but reported afterwards that they didn't feel it helped their understanding of the software, even though tinkering still predicted more effective problem solving. In this case, the more they tinkered, the more they reinforced their lack of understanding, and may have developed inappropriately low confidence in their ability to solve the problem. Men, on the other hand, seemed to hold the same level of belief in their ability to solve the problem both before and after they engaged in the exercise.

Designing training for opposites

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In the final experiment, researchers provided a different kind of tutorial — one that emphasized a strategic, rather than a feature-by-feature approach to the problem. These tutorials were short-duration videos that depicted pairs of men and women working through the problem. In addition to providing instruction, the videos were intended to serve as confidence-builders for users who might have felt less capable of solving the problem before working on the spreadsheets themselves.

Women who participated in this condition were almost as likely to use the new features as the men in the same study, and were able to solve more problems more quickly than women who didn't use the new features. Men in this condition were not significantly helped or hindered, which means that it's possible to prevent a bias against women without introducing a bias against men.

Reference

Burnett, M.M., et al. Gender pluralism in problem-solving software. *Interacting with Computers* (2011), doi:10.1016/j.incom.2011.06.004