

Pair Programming

Gild Project – Explorations.....

Exercise....

- Take a sheet of paper (or an overhead and overhead pens) and draw a “scary” face.....
- Spend about 2 mins drawing two scary faces.....

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Exercise as a pair....

- Pair up with a partner
- Take a sheet of paper (or Dana’s whiteboard) and a different colour each.....
- Spend about 2 mins drawing two faces.....

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Debriefing.....

- How did you feel when you were drawing solo vs. drawing as a pair
- Which of the drawings are more artistic or original?
- Did you find yourself concentrating more or less during the pair drawing?
- Was it more fun to draw alone or as a part of a pair
- What did you like, what didn't you like about drawing alone or as part of a pair
- Did you find yourself mirroring your partner?
- Would you expect that people get better over time drawing as part of a pair?

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Solo Drawing



Pair Drawing

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What is pair programming?

TWO programmers working side-by-side, collaborating on the same design, algorithm, code or test. One programmer, the driver, has control of the keyboard/mouse and actively implements the program. The other programmer, the observer, continuously observes the work of the driver to identify tactical (syntactic, spelling, etc.) defects and also thinks strategically about the direction of the work. On demand, the two programmers can brainstorm any challenging problem. Because the two programmers periodically switch roles, they work together as equals to develop software.

-- Laurie Williams
North Carolina State University Computer Science

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KNOWLEDGE IS commonly socially constructed, through collaborative efforts towards shared objectives or by dialogues and challenges brought about by different persons' perspectives.

G. Salomon (book: *Distributed Cognitions: Psychological and Educational Considerations*)

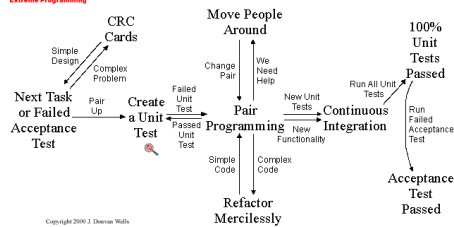
What is pair programming cont.

- Think of a good pair driving across the country. One will drive, the other navigate (thinking tactically and strategically)
- Often used as a part of extreme programming



Collective Code Ownership

[Zoom Out](#)



Some quotes from pair programmers...

“When I explained an idea to my partner, I concentrated on what I was saying, and carefully made things clear and logical because I did not want to confuse my partner and I wanted him to understand what I was talking about. It helped me better understand the problem I was addressing. It also helped me discover some mistakes I had made but did not notice before I talked with my partner.”

Some quotes from pair programmers...

“One problem with single programming is that you can forget what you are doing and easily get wrapped in a few lines of code, losing the big picture. Your partner is able to constantly review what you do, making sure that it is in line with the product design. He/she can also make sure that you are not making the problem too difficult. Many times, these two items alone can waste a lot of time. When it comes down to it, wouldn’t you rather just get the job done correctly and quickly? Collaborative programming will help you do just that.”

My own experiences teaching 1st year

- Bimodal distribution of scores on the midterms
- Some students seem very “cocky” – others are convinced they are “terrible at programming”
- Very little resources to help students
- Self-esteem quite low for many
- Isolation is prevalent among many of the students

My own experience with pair programming

- Setting the stage is very important (did exercises in class)
- Students for the most part loved it and said they would do it again but a few hated it...
- Matching of skills is probably important.... They seemed to think so
- Biggest problem experienced by students was finding a common time to get together at school (some work etc)

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Code Warriors and Code-a-Phobes

- **Code warriors** see themselves “*as a sort of code-warrior, fighting with the enemy compiler, forcing it to assent to their glorious code and to produce a program that obeys their every desire*”
- **Code-a-phobes** – seems to be an unfortunate phenomenon in computer science, report that they “*hate programming*” or that they are “*hopeless at programming*”
- Mixture of such students is part of the challenge of teaching first year programming

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Study on use of pair programming

- Williams’ studies indicate about 80-90% of students like pair programming and feel their solutions are more correct
- But another study showed differences between code warriors and code-a-phobes
 - Two variables – attitude and performance, may be independent
 - Better if they are matched in similar pairs w.r.t. attitude (didn’t look at performance in this study)
 - Code warriors are less likely to enjoy pair programming

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Discussion points

- Can we create some kind of virtual environment to enable pair programming at distributed locations – or would that not remove the condition that makes it so special?
- How can we make first year programming more fun and interesting? Can technology help?
- How can we build self esteem?
