Parsons Problems

• What are they?
  • Mixed-up code
  • Drag code over in order
  • Distractors?
  • Pick from choice?
  • Many variations
• Created 2006 by:
  • Dale Parsons
  • Patricia Haden

Last year... WG2022 - Parsons Problems Literature Review

• Found all papers on Parsons since 2006
  • Variations of: Parsons puzzles, Parsons programs, Parsons programming
  • Is it Parsons or Parson’s?
    • Interviewed Dale Parsons
  • Over 1000 papers!!
    • Narrowed to 141
• Do Studies
  • NO Time!

HOW TO DO Studies
This year - WG 3 - Three things

1) Expanded Parsons Literature Search from last year
2) Literature Search on Multi-Institutional Multi-National Studies in Computer Science Education
3) Parsons Problems Studies

1) Expanded Literature Search

• Not as extensive search
• Since last year -> 15 papers
• Most of them Research on Parsons problems, and learning programming
• On newer types of Parsons Problems
  • Adaptive Parsons
  • Framed Parsons
  • Micro Parsons

2) Literature Review: Multi-Institutional, Multi-National Studies in CSE

• 17 papers from the past 10 years
• 4 relevant papers from before that
• Difficult to do – so many considerations when comparing between different countries
  • Institutional Characteristics
  • IRBs
  • Languages, Translations

Choosing papers:
Choosing papers (cont):

As an MIMN Study

- Challenges:
  - Time constraints
  - Participants at different stages of learning
  - Globally distributed team

- Overcame with:
  - Team coordination
  - Onboarding package for faster ramp up, IRBs

- We could have used more time!

3) Parsons Problems Studies

- Study in a box
- Many different studies between 14 institutions
  - Topics: Swap, Classes, etc.
  - Mostly Python
  - Runestone Academy online platform
  - Pre/Practice/Post

- Think Aloud Studies

Here are a few results from studies we did - More in the paper!!!
Results: Python-swap

- most students were able to write the code for swap after solving three Parsons problems:
  - text comments with algorithm steps, text comments and code
  - similar pattern of engagement across all participating institutions; many attempts and time-taken on comment-sorting exercise – 80% completion rate
- no correlation between prior familiarity and success on the final post-test task
- success on first training task, and time on the comment-sorting Parsons exercise predicted success on the final post-test task; suggestive of scaffold

Recommend - WGFS:

- SIGCSE encourage:
  - Working Groups For Studies (WGFS)
  - Large MIMN Studies
- Need an earlier deadline (Sept/Oct?)
  - Time for IRBs
  - Different countries are on different school schedules
  - Not many MIMN studies done!

- SIGCSE should consider this type of WG
Questions?
Want to do a study? Contact us!