Innovations in PIAAC
How Technology and Methodology Differentiates PIAAC
How Technology and Methodology Differentiate PIAAC: Discussion

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We live in a technology-rich environment

- Technology has changed the nature of many human activities.
- The amount of information has exploded
- New ways of using this information have appeared
Why problem solving in TRE is not just problem solving

- Technology has provided new means to solve problem or perform tasks.
- Interactivity with content, structure, other people.
Problem solving with TRE is not computer literacy

- Use of the functionalities in order to make the task possible or easier, without explicit indication of what to do.
- Reorganization of the problem space
- Cognitive distribution: e.g., some steps performed automatically
What do we measure beside proficiency?

Performance does not only reflect proficiency of respondents but also other dimensions.

- Cognitive dimension
  - e.g., attentional focus
  - self-regulation capacity
  - cognitive flexibility

- Situational factors
  - e.g., self beliefs
  - goal achievement
  - computer anxiety

- Personal disposition

- Skills and knowledge

- Learned formally or through life experience


- OECD: Better policies for better lives.
• High level of education linked to high proficiency
• But not for the 16-20 y age group
• PS-TRE skills peak between age 26-30
How can process data help interpretation

• Differentiating low engagement from low achievement
• Identifying profiles of respondents from their behavior
• Unravelling the strategies leading to success or failure
How to measure engagement in the task?

- Rouet: longer time is linked with success for medium to hard items but not for easy items
- Von Davier: low engagement should be detected to avoid underestimation
  - E.g., consider fast answers (omitted, wrong or correct) as missing data, with threshold depending on the item
  - Use background data and explicit evaluation
Identifying styles and strategies from logs

- Von Davier: response style is linked with performance in numeracy and literacy
- Rouet: path efficiency is linked with performance
  - behavior can tell about cognitive processing and chance of success
  - requires thorough item analysis
Issues in using “big data” to estimate proficiency

- Log data analyses can improve interpretation, but it requires:
  - Theory-driven hypotheses
  - Item analysis (content and process)
  - Identification of profiles of respondents
Where do we go from here?

- Non routine tasks in technology rich environment are problem-solving activities, that require more than computer literacy
- Level of proficiency in problem solving in TRE is rather low, linked to informal and formal learning
- Possible to identify item-specific successful behavior
- Education should train higher order thinking and creative use of technology
Thank you for your attention