

Process Data

62nd General Assembly
27 October 2021

Juliane Hencke
IEA Hamburg

Introduction

- All IEA studies have either digital components or are fully digital in their current cycle.
- Process data brings a lot of new opportunities, but also new challenges.
- For TIMSS 2019 many thoughts went into the processing of process data and into developing a release model.

Opportunities

- Test and apply new sophisticated psychometric models to improve measurement.
- Develop new item types that focus on the correct execution of processes.
- Improve the development of tests and questionnaires by closer examination of the work process in previous instruments.
- Gain deeper insight into cognitive processes.
- Shed light on an area which were not accessible in paper-based assessment, e.g., aspects of motivation.

Challenges

- It needs to be clarified to which degree theory and evidence support the use and interpretation of process information.
- Meaningful and relevant processes and corresponding events that provide evidence need to be defined in parallel to the item development.
- Increased and additional knowledge and skills on data processing and analyses are needed.
- For data dissemination, database trainings need to be enhanced to familiarize researchers with the new data.
- Additional time and resources are needed to define, implement into CBA system, test, document, and disseminate event data and corresponding process information.

Available data for TIMSS 2019

- High-level process data were released as part of the international database and include
 - Total time on page
 - Total number of visits per page
 - One record per student
- National low-level detailed log-file data were made available to participating countries

Research on process data

- Research on process data is in a very dynamic state, however, as a research area relatively young.
- The number of researchers and research projects is continuously increasing – with a growing number of data scientists.
- Exploratory studies predominate the field.
- Terminology, taxonomy, standards and theoretical foundations evolve, but are still under discussion and development.

Beyond results workshop(s)

- In the light of this situation, the Beyond Results workshop series was established in cooperation with the DIPF (Leibniz Institute for Research and Information in Education) and the ZIB (Centre for International Student Assessment).
- Focus this year was on the validity and the theory-based construction of process indicators.
 - Keynote speakers were Susan Embretson (Georgia Institute of Technology) and Robert Mislevy (University of Maryland).
 - Matthias von Davier (Boston College) and Stephen Sireci (University of Massachusetts Amherst) engaged in a debate on “Derived Constructs versus Designed Constructs”.

Where are we now?

- Definition of process data and corresponding events considerably improved during the last year and will improve in future.
- Data are now increasingly collected.
- Since IEA is working with one CBA-vendor, a more or less standardized data format across studies can be achieved.
- IEA - together with DIPF and ZIB - agreed upon a close cooperation with the FLIP+ community on process data.
- Available process data need to be and will be analyzed.
- This year's allocation of R&D funds were dedicated to supporting analyses of process data.

Thank you!

Juliane Hencke, IEA Hamburg
juliane.hencke@iea-hamburg.de



Researching education, improving learning

