IEA Hamburg Developments

64th IEA General Assembly
27 September, Versailles

Juliane Hencke, Director of IEA Hamburg
Day-to-Day Business

The implementation of the studies this year was smoother than last year, both nationally and internationally.

Studies in Germany (>14)
- TIMSS-Germany
- ICILS-Germany
- Bildungstrend 2021*
- Bildungstrend 2022*
- PISA-Germany*
- NEPS*
- INSIDE II
- EvIk
- FIPS+
- TALIS Starting Strong Germany
- TOSCAneo
- PerFair
- KWiK
- SchiWa
- …

International IEA Studies (9)
- PIRLS 2021*
- ICCS 2022
- ICILS 2023*
- TIMSS 2023*
- TIMSS-L
- LaNA
- PIRLS 2026
- ICCS 2027
- ICILS 2028

Additional International Studies (5)
- OECD TALIS 2024*
- OECD PIAAC Cycle 2
- OECD IELS 2024
- National Evaluation Haiti
- UNICEF LSCE
Day-to-Day Business (cont.)

- Increased attendance of in-person meetings, events, conferences
- Recruited, hired, and introduced new colleagues
- Intensified activities around knowledge transfer
- Continuous review of internal processes to verify suitability of fast changing computer-based assessment (CBA)-world
- Participated in tendering processes, proposal writing
- Took care of data protection and information security issues

... and much more
Starting three years ago, IEA began development of its own new system to run CBA studies.

Serves as a platform for creating, managing, and implementing digital assessments.

Initiated by the desire to decrease dependencies on external services that host CBA systems.

Having our own system gives IEA better control.
IEA StudyExpert: Development Stages

Pilot (in 2022)
- In one country (Germany)
- TIMSS 2023 Field Test questionnaires used online and offline (via USB sticks)
- Worked out well and will be repeated for the Main Data Collection

TALIS Field Test (in 2023)
- For all TALIS countries and instruments (various types of questionnaires)
  - Demanding period
  - Worked well, no outages
  - > 38,000 records collected

TALIS 2024 Main Survey (in 2024)
- For all TALIS countries and instruments (various types of questionnaires)
  - Many improvements implemented
  - Move to Amazon Cloud

Planning for ICCS, ICILS (in 2024, 2025, ...)
- Exchange between development team and Study Directors began
- Requirements gathering started
- Different possibilities under consideration
New IEA OSE

• IEA’s Online Survey Expert (OSE) is a web-application used in national studies for listing information and preparing data collection at schools
  – Documents can be shared with persons on all levels in an addressable manner
  – School coordinators can submit information, this information can be retrieved through different interfaces
  – It samples classes, students
  – Linkages between students and teachers can be created via a visual interface using drag and drop
  – Complies with all German data protection regulations

• It is used by project coordinators in all German states

• First OSE was developed in 2013 and has been used in Germany since 2014—it has been completely revised and extended and was technologically updated

• Has a responsive interface, so it can be used on devices with different screen sizes, and user languages can be customized
### New IEA OSE – Example Screenshots

#### Student Listing Form (fake names)

<table>
<thead>
<tr>
<th>Schüler-ID</th>
<th>Vorname</th>
<th>Nachname</th>
<th>Geburtsmonat</th>
</tr>
</thead>
<tbody>
<tr>
<td>768999 - 0001</td>
<td>Lena</td>
<td>Blümel</td>
<td>8</td>
</tr>
<tr>
<td>768999 - 0002</td>
<td>Noah</td>
<td>Dörge</td>
<td>11</td>
</tr>
<tr>
<td>768999 - 0003</td>
<td>Karl</td>
<td>Dombusch</td>
<td>6</td>
</tr>
<tr>
<td>768999 - 0004</td>
<td>Matteo</td>
<td>Kluck</td>
<td>3</td>
</tr>
<tr>
<td>768999 - 0005</td>
<td>Fabienne</td>
<td>Marwede</td>
<td>3</td>
</tr>
<tr>
<td>768999 - 0006</td>
<td>Marion</td>
<td>Marwede</td>
<td>2</td>
</tr>
<tr>
<td>768999 - 0007</td>
<td>Pauline Lara</td>
<td>Maurischat</td>
<td>11</td>
</tr>
<tr>
<td>768999 - 0008</td>
<td>Hauke Alexander</td>
<td>Pöppe</td>
<td>5</td>
</tr>
<tr>
<td>768999 - 0009</td>
<td>Nele</td>
<td>Soltendieck</td>
<td>7</td>
</tr>
</tbody>
</table>

#### Teacher Listing Form – Validation (fake names, fake validations)

<table>
<thead>
<tr>
<th>Lehrer-ID</th>
<th>Vorname*</th>
<th>Nachname*</th>
<th>Klassenleitung im Jahrgang 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>768999 - 8001</td>
<td>Judith</td>
<td>Lehner</td>
<td>6a.6b</td>
</tr>
<tr>
<td>768999 - 8002</td>
<td>Dietmar</td>
<td>Langusch</td>
<td>6a</td>
</tr>
<tr>
<td>768999 - 8003</td>
<td>Jürgen</td>
<td>sdf</td>
<td></td>
</tr>
<tr>
<td>768999 - 8004</td>
<td>Babett</td>
<td>Kurzius-Beuster</td>
<td>6a</td>
</tr>
<tr>
<td>768999 - 8005</td>
<td>Susanne</td>
<td>Abels-Pintze</td>
<td>6a</td>
</tr>
<tr>
<td>768999 - 8006</td>
<td>Julia</td>
<td>Eckhardt</td>
<td>6a</td>
</tr>
<tr>
<td>768999 - 8007</td>
<td>Astrid</td>
<td>Apfelstaedt</td>
<td></td>
</tr>
</tbody>
</table>

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OSE

OSS

Study Expert

IEA OSS
IEA OSS

- IEA’s Online SurveySystem (OSS) has been used in the past to administer questionnaires online, but only for adult questionnaires.
- To reduce burden on RM, IEA decided to also administer student questionnaires in TIMSS 2023 using OSS.
- However, this imposed challenges as a large number of students would be accessing the questionnaire at the same time.
- To cope with a significant influx of users at any one time, an extension of the server infrastructure was required.
Busiest month:

- May 2023 - almost 300,000 logins in total
- nearly 90,000 uploaded student records

Highest peak on a single day:

- 10 May 2023 with >27,000 logins

Peak loads:

- around 10 am with almost 90,000 logins

Online administration
USB administration

Logins per month
Uploads per month

Logins per day (Feb - Jun 2023)
Uploads per day (Mar - Jun 2023)

Logins throughout the day (per hour CET/CEST)
Uploads throughout the day (per hour CET/CEST)

576,464 logins

136,711 uploaded USBs by now

"Stress-test" for Setups (TIMSS 2023, Feb-Jun 2023)
Data Security

- Server attacks are increasing
- IEA Hamburg has been hit
- Re-evaluate all server/ software update procedures
- Agreed on (more) regular maintenance windows
- Plan for external auditing
AI at IEA (Hamburg & Amsterdam)

Discuss possible fields of applications of AI for IEA

- Translations
- Data processing
- Scoring/coding
- Item development
- Improving texts
- Code for Software, Scripts, Macros

Discuss what needs to be considered when using AI at IEA

- Copyrights
- Which apps? Which providers?
- Transparency
- Data protection
- Background knowledge
- Information security
- Clear rules

Guidelines for IEA staff
Data Processing 2030
Data Processing 2030

• Number of data sources have increased since paper-times

Data sources in paper and pencil administrations

- IEA DME to enter data from paper into electronic format
- IEA WinW3S to list and track students within sampled schools
- IEA DPE to process data internationally

Data sources during transition from paper to digital assessments

- IEA DME to enter data from paper into electronic format
- IEA WinW3S to list and track students within sampled schools
- IEA OSS to collect data for online questionnaires
- RM AM to collect student response data to digital assessment and student process data
- IEA CodingExpert to score open-ended student responses

IEA DME = IEA DataManagementExpert
IEA WinW3S = IEA Windows Within-school Sampling Software
IEA OSS = IEA OnlineSurveySystem
IEA DPE = IEA DataProcessingExpert
RM AM = RM Assessment Master
## Data Processing 2030

- **Types of problems that occurred during and after test administration change**

<table>
<thead>
<tr>
<th>Problem</th>
<th>Paper administration</th>
<th>Digital administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incomplete records</td>
<td>Misprints</td>
<td>Technical failure</td>
</tr>
<tr>
<td>Swapped records</td>
<td>Wrongly assigned assessment materials</td>
<td>Wrongly assigned assessment materials</td>
</tr>
<tr>
<td>Missing records</td>
<td>Instrument lost</td>
<td>Record lost (does not arrive at server, USB stick lost)</td>
</tr>
<tr>
<td>Duplicate records</td>
<td>n/a</td>
<td>Student login used twice</td>
</tr>
<tr>
<td></td>
<td>n/a</td>
<td>Student started on one device, continued at another device</td>
</tr>
<tr>
<td></td>
<td>Instrument entered twice</td>
<td>USB stick uploaded twice</td>
</tr>
<tr>
<td>Implausible values</td>
<td>Mispunched student answers</td>
<td>n/a</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

- **Data processing needs to be adjusted accordingly**
Thank you!
Merci!

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