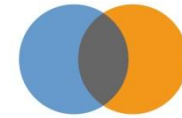


DIPF

Educational Research
and Educational Information

Large Scale Assessment (LSA) and Technology-Based Assessment (TBA) activities at DIPF



DIPF

Educational Research
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Large Scale Assessment (LSA) and Technology-Based Assessment (TBA) activities at DIPF

Frank Goldhammer, Heiko Rölke

LSA activities at DIPF (1)

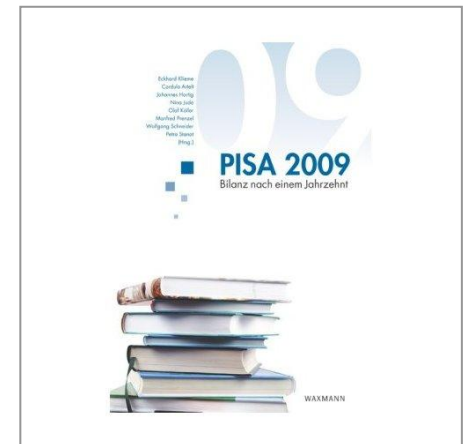
- DIPF leads, coordinates and implements national and international LSA studies
- Studies aim at the investigation of the quality and outcome of educational processes at school and classroom level
- Major fields: Measuring and modeling competencies, technology-based assessment, school and classroom context

LSA activities at DIPF (2)

- Programme for International Student Assessment (PISA)
 - PISA 2009
 - PISA 2012
 - PISA 2015
- Programme for the International Assessment of Adult Competencies (PIAAC)
- National Educational Panel Study (NEPS)
- Center for International Large Scale Assessment (ZIB)

PISA 2009 – national level

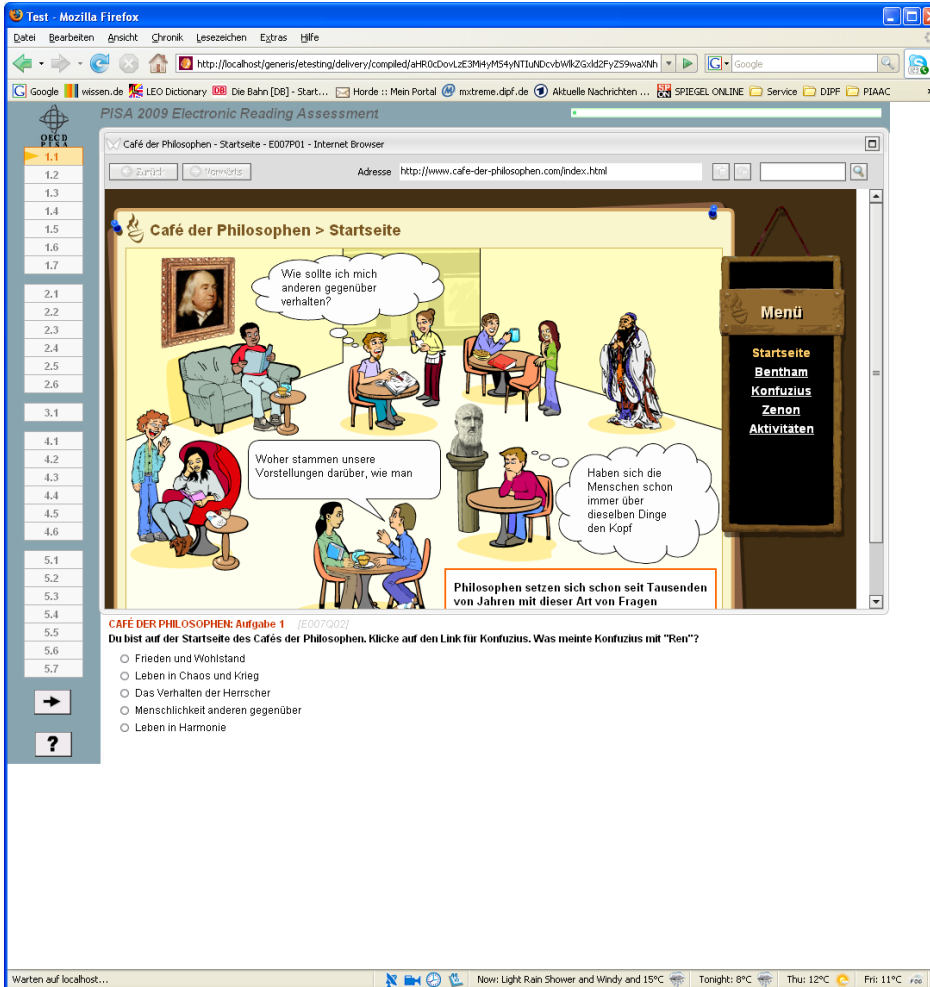
- Implementation of the PISA study in Germany
- National extension of the PISA study for research purposes (e.g., to validate the Electronic Reading Assessment, ERA)



PISA 2009 – international level

- Membership of the international expert group for the Electronic Reading Assessment (ERA), i.e., contribution to framework and and test development, data analysis and reporting (Vol. VI)
- Provision of technology for the development and delivery of ERA items (TBA group: Hypertext Builder, delivery system using CD ROMs)

PISA 2009 – ERA sample task



CAFÉ DER PHILOSOPHEN: Aufgabe 1 [E007Q02]

Du bist auf der Startseite des Cafés der Philosophen. Klicke auf den Link für Konfuzius. Was meinte Konfuzius mit "Ren"?

- Frieden und Wohlstand
- Leben in Chaos und Krieg
- Das Verhalten der Herrscher
- Menschlichkeit anderen gegenüber
- Leben in Harmonie

Task 1: You are at the Philosophers' Café Home page. Click on the link for Confucius.

What did Confucius mean by "Ren"?

- Peace and prosperity.
- Living in chaos and war.
- The behaviour of rulers.
- Kindness to other people.
- Living in harmony.

PISA 2012 – national level

- National extension of the PISA study for research purposes (e.g., to validate CBA components)

PISA 2012 – international level

- Chair of the international PISA Questionnaire expert group and responsibility for the analytical framework
- Technological support of translation workflow; delivery system for CBA components (USB stick)



PISA 2015 – international level

- Successful bid for Core 6 module („Context Questionnaire and framework development“)
covering the development of the context questionnaires for PISA 2015 and their conceptual framework

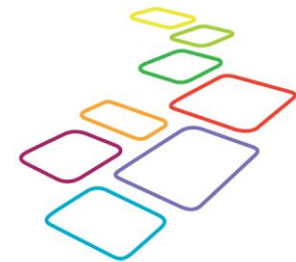
PIAAC – international level

- Programme for the International Assessment of Adult Competencies
- Initiated by OECD
- Target population: 16 – 65 years
- DIPF: Technology for item and test development, translation, delivery, technical support



NEPS

- National Educational Panel Study
- Funded by Federal Ministry of Education and Science (BMBF)
- Investigates educational processes in Germany, from early childhood to advanced age
- DIPF: Data Warehouse, Mode Effect Studies (CBA vs. PBA)



ZIB

- Center for International Large Scale Assessment (ZIB)



IPN - Institute for Science and Mathematics Education

IQB - Institute for quality development in education

DIPF

TUM – Technical University Munich, School of Education

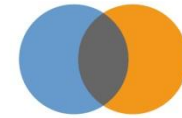
ZIB

- Center for International Large Scale Assessment (ZIB)
- Goals
 - national implementation of PISA
 - research on international comparative studies in education
- DIPF: Research on educational assessment using technology



Some more LSA activities at DIPF

- Deutsch Englisch Schülerleistungen International (DESI)
[German English Student Assessment International]
- Building a European Bank of Anchor Items for Foreign Language Skills (EBAFLS)
- Teaching and Learning International Survey (TALIS)



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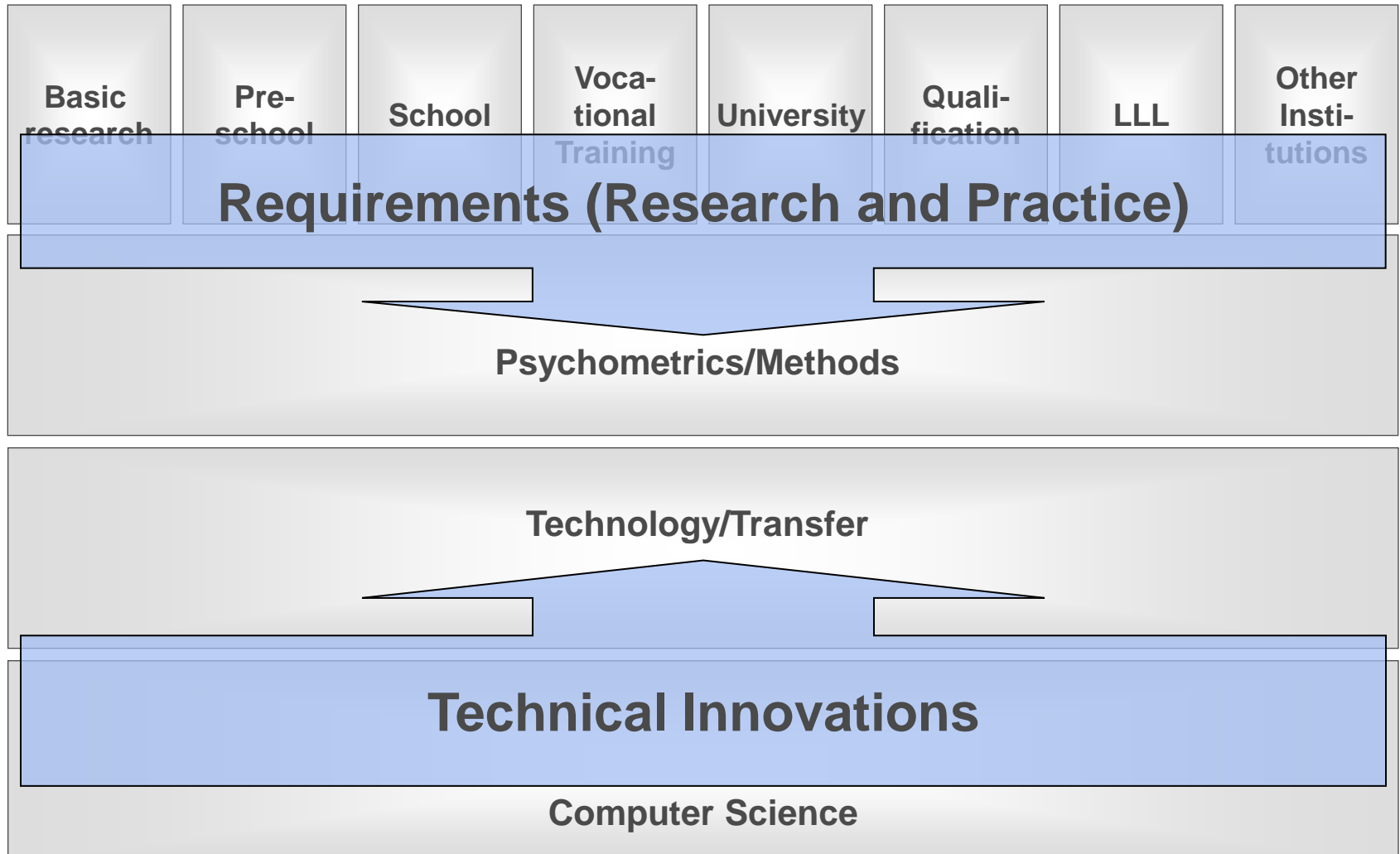
Large Scale Assessment (LSA) and Technology-Based Assessment (TBA) activities at DIPF

Heiko Rölke, Frank Goldhammer

TBA: Mission Statement

- Support national and international assessments
- Develop innovative assessment instruments and methods
- Perform assessment-related research, both in psychology and computer science

TBA: Background



TBA: Group Structure

Main Idea:

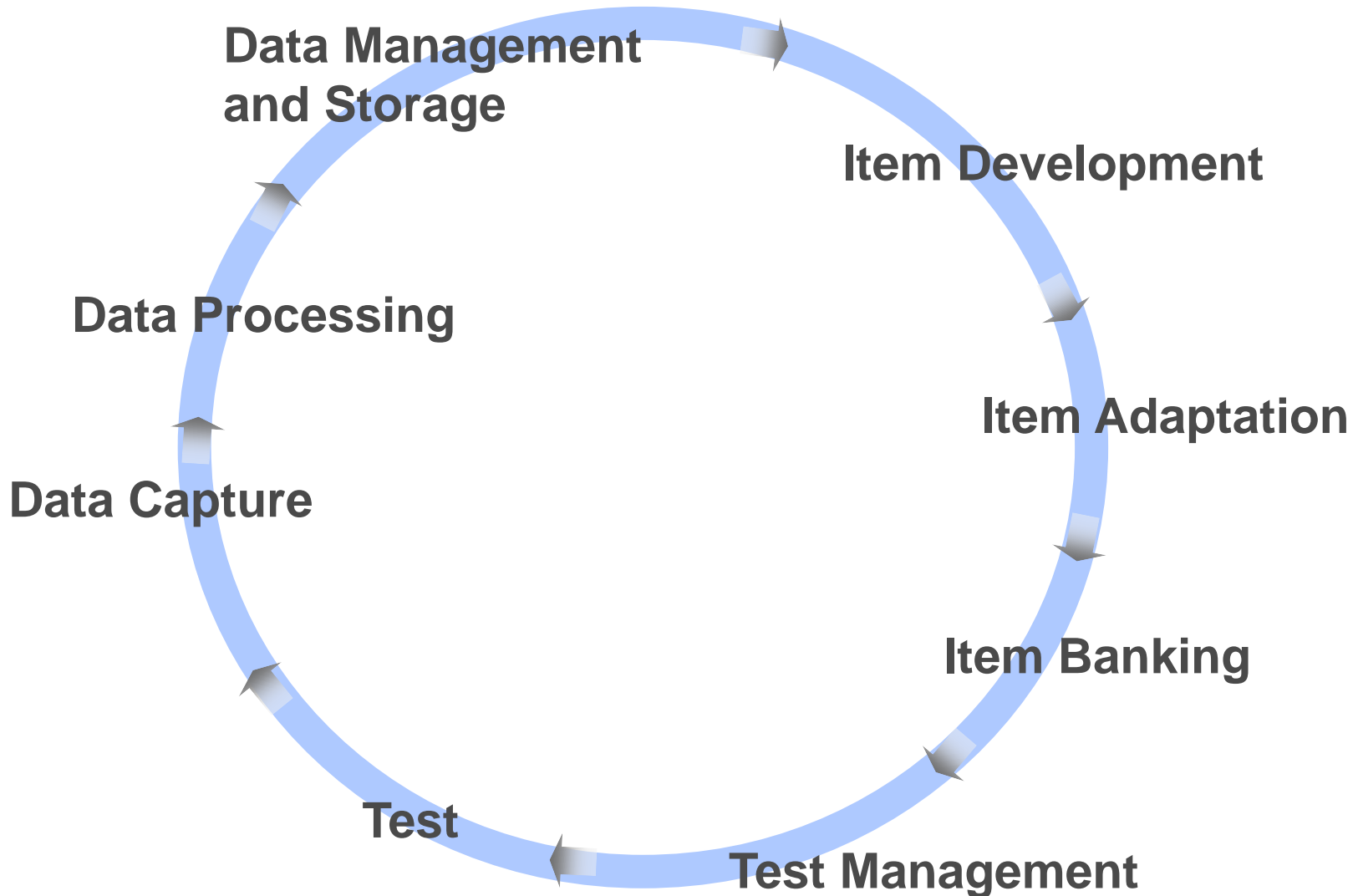
Innovations and sustainable development
requires work of equal partners

- Psychology
- Computer Science

TBA: Key Ideas

- Empower users,
 hide complexity
- Integrated workflow support
- Rapid prototyping of ideas: instruments, methods, ...
- Re-use instead of re-invention

TBA: Technology Chain



Example: CBA ItemBuilder

- **Idea:**

Enable domain experts to design/implement complex items

- **Concept:**

- Graphical GUI design in a (near) WYSIWYG-manner
- Authoring system, intelligent templates
- Generation of item descriptions, run-time interpretation

- **Implementation:**

- Based on open-source and freely available software
- Model-driven architecture

CBA IB: Guiding Principles/Strategy

- Graphical Development
- Emphasis on Complex Items
- Modular development: Features
 - Restricted versions, e.g. Adaptation
- Modular development: Delivery
 - TAO
 - CBA-EE
 - TBA-Tools
 - ...

From HypertextBuilder to CBA ItemBuilder

1. PISA 2009 - ERA
2. Intermediate Development:
„Dynamis“
3. PIAAC
 - Interaction modes
 - Fine-grained graphics control, rich text fields
4. New Development:
Finite Automata

Browser Simulation:

Portal of the German Rail (Deutsche Bahn)



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Browser navigation bar with menu items: Datei, Bearbeiten, Ansicht, Chronik, Lesezeichen, Extras, Hilfe. Open tabs include: las..., SWFTO..., debian..., TrueTyp..., Debian..., linux fla..., Adobe..., Issue N..., [#FP-4..., [#FP-1..., Test.

TBA 2009 Electronic Reading Assessment

TBA

1.1

2.1

3.1

4.1

5.1

6.1

7.1

8.1

9.1

10.1

11.1

12.1

13.1

14.1



Zug browser window header with navigation buttons (Zurück, Vorwärts, Home) and address bar (http://www.zug.de). Main image showing a train platform with blurred lights.

Search and login sidebar:

- Suche
- Reiseauskunft - Tickets
- Mein Login: Benutzer: [input], Passwort: [input], Login
- Passwort vergessen
- Erstmalig anmelden
- Login Firmenkunden
- Geschäftsreisende
- Vielfahrer&Pendler
- Familien&Kinder
- Teens&Twens
- Gruppen&Klassen
- 55plus
- Handicap
- Bahnfans

Meine Suche:

Navigation: **Bahn** | Städtereisen | Hotel | Mietwagen | Aktuelle Ankunft/Abfahrt

von: München | Reisende: 1 Erwachsener
nach: Münster | -> Reisende hinzufügen
Datum: 17.04.2008 | BahnCard: Keine BahnCard-Ermäßigung
Zeit: 12:40 | Abfahrt | Klasse: 2. Klasse

English | Français | Italiano | Español | Nederlands

erweiterte Suche **Suchen**

Deutschland erleben

Freuen Sie sich auf den Frühling und lernen Sie Ihr Land kennen!
Bei uns finden Sie Ausflugstipps, Specials und regionale Angebote.

Ob eine Städtereise oder eine Fahrt in die Natur - bei uns ist alles dabei!

Für April und Mai gibt es noch freie Angebote in unserem Kontingent, z.B. für Ferien an der Ostsee oder im Schwarzwald ([mehr Infos](#)).

PISA 2009 – ERA: Language Support

The screenshot shows a web browser window titled "PISA 2009 Electronic Reading Assessment" with the URL "http://www.pisa.org/practice/textbox1.html". The page content is in Chinese and includes a navigation menu on the left with items 1.1 through 2.3. The main content area is titled "練習單元1 - 題目" and "文字方塊式答案 (1)". It contains instructions for a text input task and a visual example of a text box with a keyboard overlay. The keyboard overlay shows a grid of keys including letters, punctuation, and function keys. Below the text box, there are three radio button options for the task.

練習單元1 - 題目

文字方塊式答案 (1)

回答文字方塊題，點擊文字方塊內並輸入你的答案。

有些文字方塊在題目區內出現。有些在瀏覽器區內。

有時題目要求你在文字方塊內輸入答案後，點擊另一個按鈕(例如「寄出」)。

文字方塊看似這樣：

在這裡輸入你的名字...

qwerty

資, .

., . ? ; ! \ ' : ... - -

「」【】♀♂♂

↑ ↓ ← → ∞ @ + × ☆ ★ ♥

☉ ○ ● - ▲ □ ■ - ▼ ™

練習單元1：題目5 [E00P005]

閱讀「文字方塊式答案(1)」一頁。

在文字方塊內輸入你的名字然後點擊「寄出」。

你現在有兩個選擇。一個選擇是「寄出你的訊息」。另一個選擇是甚麼？

- 刪除你的訊息。
- 修改你的訊息。
- 儲存你的訊息。

PIAAC: New Features

- Rich text fields, advanced text layout
- Images, Multi-media player
- Dynamic Links
- Configurable Size
- Execution Environment
- New Response Modes
 - Clickable Areas (Text, Images)
 - Multiple Marking (highlight)
 - Click boxes, Buttons, Text entry, Tables,...
- Automatic Scoring

New: MicroDYN, MicroFIN

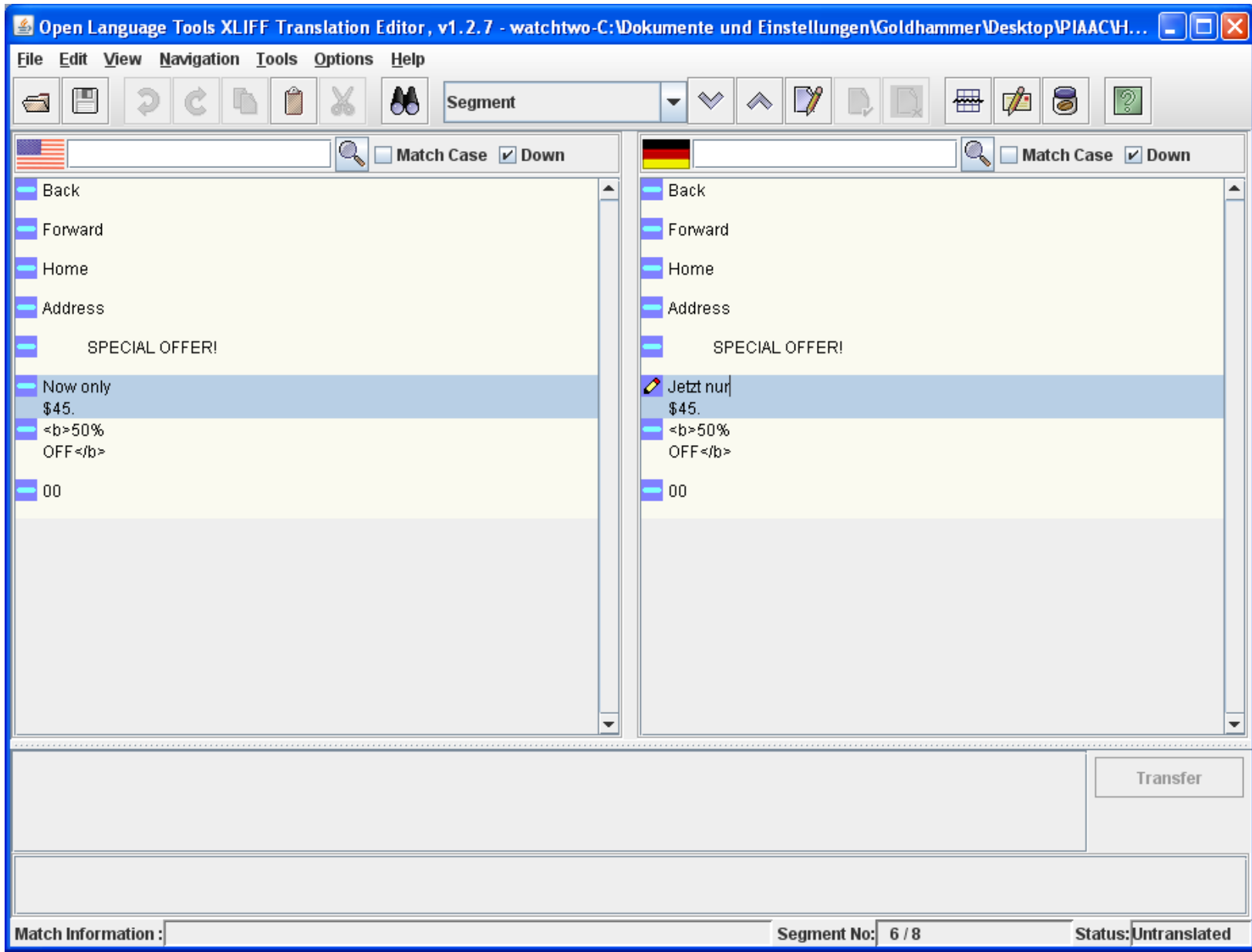
- For complex problem solving and advanced simulation items
- Finite Automata to
 1. Control Item behaviour
 2. Serve as a basis for Problem solving
- 1. Realistic behaviour for complex items
 - GUI simulation
 - Complex settings like science education
- 2. Basis for items, to be discovered by testee

Translation Features

ItemBuilder exports all text and text properties

- XLIFF
 - standard file format for translation
 - source language, target languages
 - supported by all major translation tools
- OLT
 - free (open source) translation tool
 - used for PISA and PIAAC

Translation: Example



The screenshot displays the Open Language Tools XLIFF Translation Editor interface. The window title is "Open Language Tools XLIFF Translation Editor, v1.2.7 - watchtwo-C:\Dokumente und Einstellungen\Goldhammer\Desktop\PIAACW...". The menu bar includes File, Edit, View, Navigation, Tools, Options, and Help. The toolbar contains icons for file operations, navigation, and editing. The main workspace is split into two panes: the left pane is for the source language (English, USA) and the right pane is for the target language (German, DEU). Both panes show a list of segments with navigation buttons (Back, Forward, Home, Address) and a search bar with "Match Case" and "Down" options. The selected segment in both panes is "SPECIAL OFFER!". The source text is "Now only \$45. 50% OFF 00". The target text is "Jetzt nur \$45. 50% OFF 00". A "Transfer" button is visible in the bottom right corner. The status bar at the bottom shows "Match Information:", "Segment No: 6 / 8", and "Status: Untranslated".

Conclusions

- Challenges related to TBA
 - Technical requirements (Hardware, Software, Staff)
 - Test equivalence (cross mode)
 - Test fairness
- Benefits from TBA
 - Standardized delivery and scoring
 - More valid item formats (e.g., simulations)
 - Measurement efficiency (adaptive testing)
 - Economical data collection and analysis

TBA Offers and Services

TBA has experience and expertise in all areas of assessments

- Consultancy
- Tools and workflows
- Tailored solutions
- Assessment services