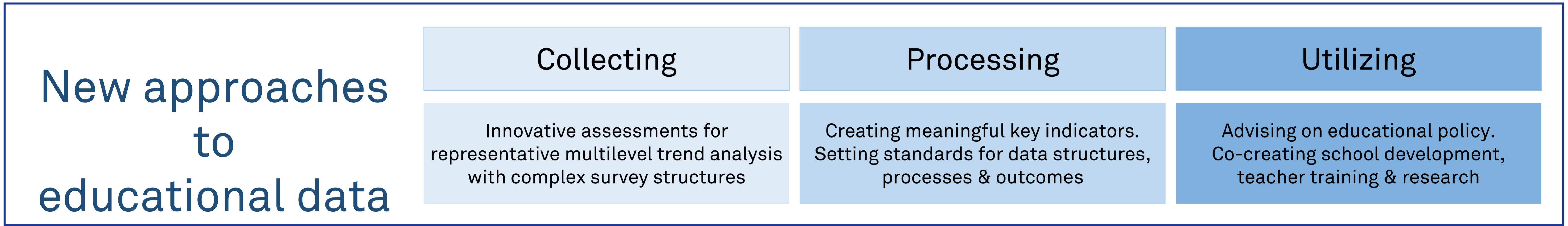


Research Field: Educational data *for* the future

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Background

- Educational data is the foundation for strong, sustainable educational institutions for a prosperous future, societal change, and educational equality in a complex world.
- International large-scale assessments are based on an interdisciplinary integration of psychometrics, subject-specific content theories, and educational theories.
- Measure intended, implemented, and achieved curriculum levels (Mullis & Martin, 2007)
- Understand outcomes and processes of teaching and learning within a broader social, institutional, and organizational context of education (Kuger et al., 2016)

Overarching Research Goals

- The fusion of the assessment of knowledge, attitudes, and behavior with technological and AI-based innovations for national and international comparison.
- The regular update and contextualization of data on the academic achievement of students and educational institutions in Germany in the context of societal progress and in an international comparison.
- The analysis of representative data and big data sources (e.g., administrative data) to shed new light on educational quality, needs, and processes that will advance the future of education.

Prominent Methodological Approaches

- Collecting data:** (1) Representative Survey Design & secondary analysis of administrative statistics, (2) AI-assisted test development and psychometrics, (3) Use of semi-structured and unstructured data sources (e.g., log file data)
- Processing data:** (1) Setting key indicators between countries and over time, (2) Cross-referencing insights to determine robustness of information, (3) AI-assisted automated scoring of open response formats.
- Analyzing and Utilizing data:** (1) Identifying the impact of educational contexts (e.g., multi-level analysis), (2) Distinguishing groups for educational policies (e.g., Latent Class Analysis), (3) Finding causal inferences (e.g., difference-in-difference analysis)

Social Relevance

- Understanding how young students' achievement levels compare over several years and across different countries is essential for evidence-based education policies.
- Being able to relate educational outcomes to malleable antecedents within education systems is of utmost importance for policy development.
- The theoretical frameworks and psychometric tools of large-scale assessment studies contribute to the development of innovative curricula and learning environments.

Examples of Related Research Projects and Networks

International Large Scale Assessment on School Performance

- Progress in International Reading Literacy Study (PIRLS)
- International Computer and Information Literacy Study (ICILS)
- International Civic and Citizenship Education Study (ICCS), www.iccs-germany.org



National Projects on educational institutions and lifelong learning

- National Educational Panel Survey (NEPS)
- Monitoring Civic Education in Germany (MonitorPB), www.bericht-pb.de



Future Perspectives

- Integration and adaptation of novel analytical approaches (e.g., analysis of log file data, machine learning)
- Improved infrastructure for research data management
- Enhanced support for early career researchers (ECRs) regarding methodological issues
- Effective communication and dissemination of research results to the academic community and the public

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Key Literature

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