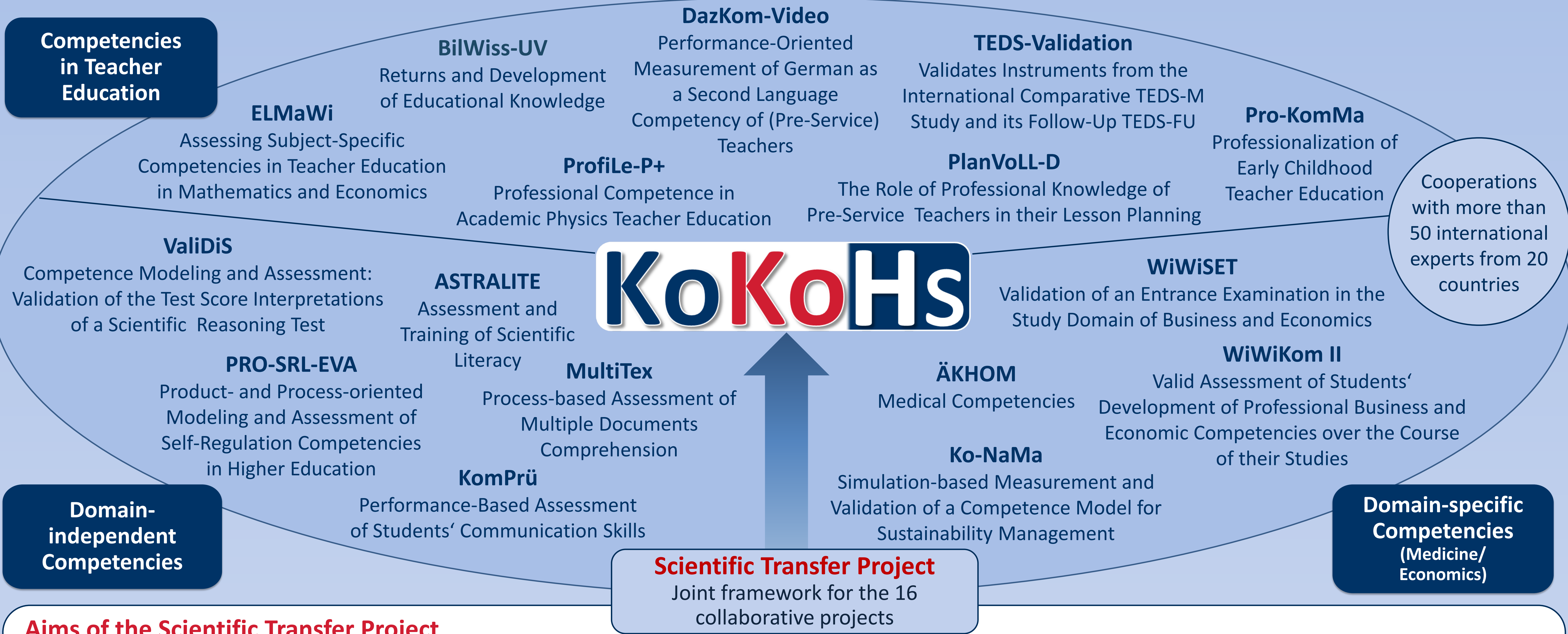# KoKoHs

Modeling and Measuring Competencies in Higher Education – Validation and Methodological Innovations

www.kompetenzen-im-hochschulsektor.de

Background and Focus of the Research Program

Valid assessments of competencies acquired in higher education can provide important information about the preconditions for, influences on, and outcomes of teaching and learning in higher education. In the first funding phase of the German research program "Modeling and Measuring Competencies in Higher Education" (KoKoHs), funded by the Federal Ministry of Education and Research from 2011 to 2015, competency models and corresponding test instruments were developed and tested empirically throughout Germany. In the new KoKoHs program from 2015 to 2019, existing models and instruments are being validated in depth, and innovative methods for assessments and analyses are being developed and tested. The focus lies on longitudinal multilevel analyses for (field) experimental assessment studies and also on transferring results into higher education practice.

Competencies in Teacher Education

DazKom-Video — Performance-Oriented Measurement of German as a Second Language Competency of (Pre-Service) Teachers

BilWiss-UV — Returns and Development of Educational Knowledge

TEDS-Validation — Validates Instruments from the International Comparative TEDS-M Study and its Follow-Up TEDS-FU

ELMaWi — Assessing Subject-Specific Competencies in Teacher Education in Mathematics and Economics

Pro-KomMa — Professionalization of Early Childhood Teacher Education

ProfiLe-P+ — Professional Competence in Academic Physics Teacher Education

PlanVoLL-D — The Role of Professional Knowledge of Pre-Service Teachers in their Lesson Planning

Cooperations with more than 50 international experts from 20 countries

ValiDiS — Competence Modeling and Assessment: Validation of the Test Score Interpretations of a Scientific Reasoning Test

ASTRALITE — Assessment and Training of Scientific Literacy

KoKoHs

WiWiSET — Validation of an Entrance Examination in the Study Domain of Business and Economics

PRO-SRL-EVA — Product- and Process-oriented Modeling and Assessment of Self-Regulation Competencies in Higher Education

MultiTex — Process-based Assessment of Multiple Documents Comprehension

ÄKHOM — Medical Competencies

WiWiKom II — Valid Assessment of Students' Development of Professional Business and Economic Competencies over the Course of their Studies

KomPrü — Performance-Based Assessment of Students' Communication Skills

Ko-NaMa — Simulation-based Measurement and Validation of a Competence Model for Sustainability Management

Domain-independent Competencies

Domain-specific Competencies (Medicine/Economics)

Scientific Transfer Project — Joint framework for the 16 collaborative projects

Aims of the Scientific Transfer Project

From 2015 to 2019, the **scientific transfer project** at Johannes Gutenberg University Mainz and Humboldt University of Berlin aims to optimize the overall research performance of the program by promoting exchange, disseminating results and findings, and supporting the transfer into practice. By systematically integrating results and findings, the project fosters the national and international compatibility and visibility of the KoKoHs research and promotes the use of competency models and instruments to improve higher education practice and policy.

Validation Work in the Research Programme KoKoHs
(Validation Criteria according to AERA, APA & NCME 2014)

Response Processes
- Evaluations of Post-Patient Encounter Forms
- Analyses of Logfiles
- Eye-Tracking
- Cognitive Labs
- Think-Aloud-Studies

Test Content
- Expert Surveys, Workshops and Ratings
- Delphi-Methods
- Document Analyses
- Textbook Analyses
- Curricula Analyses

Relations with other Variables
- Predictive characteristics, e.g., prediction of examination performance
- Discriminant characteristics, including the differentiation from general cognitive abilities

Test Consequences
- Angoff-Method
- Group Comparisons
- Testfairness-Examinations
- DIF-Analyses

Internal Test Structure
- IRT Scalings
- Analyses of Factor Structures
- Multidimensional Rapid Modelling
- Cross-Sectional and Longitudinal Analyses

Types of KoKoHs Test Instruments

	Number of Projects
Paper-Pencil-Tests	12
Computer-Based Tests	10
Video-Based Tests	5
Simulation-Based Tests (without video sequences)	3
Further Instruments (monitoring procedures, cell phone apps, work samples etc.)	7

Recent publications

- Zlatkin-Troitschanskaia, O., Toepper, M., Pant, H. A., Lautenbach, C., & Kuhn, C., (Eds.) (2018). *Assessment of Learning Outcomes in Higher Education – Cross-national Comparisons and Perspectives.* Wiesbaden: Springer.
- Zlatkin-Troitschanskaia, O., Pant, H. A., Lautenbach, C., Molerov, D., Toepper, M., Brückner, S. (2017). *Modeling and Measuring Competencies in Higher Education - Approaches to Challenges in Higher Education Policy and Practice.* Wiesbaden: Springer.

Areas of KoKoHs Test Use

		Number of Projects
Proven Areas of Use	Beginning of Studies	8
	Middle of Studies	11
	End of Studies	9
	Bachelor	14
	Master	11
	Practical Phase/ Traineeship	4
	Career	7
	Local Assessment	3
	Large-Scale-Assessment	5
Potential Areas of Use	Formative Diagnostics	11
	Initial Diagnostics (Beginning of Studies)	8
	Summative Diagnostics (End of Studies)	15
	Prognosis for professional Activities	10

Johannes Gutenberg University Mainz

Prof. Olga Zlatkin-Troitschanskaia

Jennifer Fischer

Miriam Toepper

Humboldt University of Berlin

Prof. Hans Anand Pant

Corinna Lautenbach