Exploring the Discriminant Validity of an Entry Test in the Study Domain of Business and Economics - Results from a National Representative Large-scale Assessment

Aims

- Multiple studies indicate prior knowledge as the strongest predictor for study success.
- This correlation was mostly studied using a cross-sectional method so far (e.g., comparisons of study progress between beginners and graduates).
- In the quasi-experimental longitudinal large-scale study WiWiKom II, bachelor students complete various tests at four measurement points.

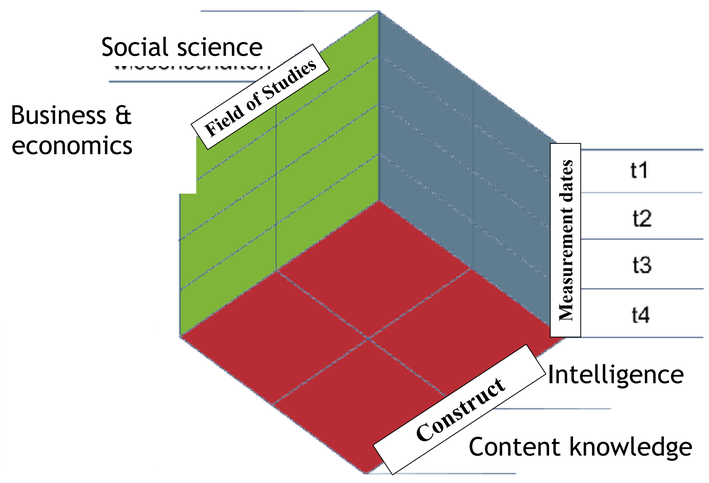
Test instruments and Design

Measurement of economic knowledge

- Test of Economic Literacy IV (TEL IV, 15 Items)
- Test of Understanding College Economics IV (TUCE IV, 10 Items)
- Cronbachs α: .74

Berlin test of fluid and crystallized intelligence

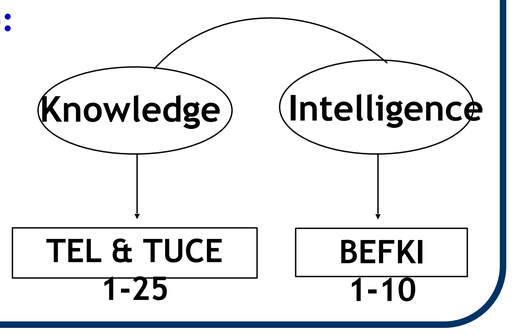
- Measurement of fluid intelligence (BEFKI, 16 Items)
- Cronbachs α: .66



Method

- Comparison of two groups of students (Social science and Business & Economics) and comparative analysis of the economic knowledge and the intelligence test

- **Confirmatory Factor Analyses (CFA):** Comparison of unidimensional vs. multidimensional structures
- **Multilevel Analyses:** Clustered by universities



Sample

- First-year students (Bachelor studies, N=9,025)
- German-wide from 54 universities and universities of applied sciences
- Domains: Social sciences and Business & Economics

	Social	Economics	Total
Gender			
Female	833 (58.9%)	3469 (45.4%)	4302
Male	569 (40.2%)	4154 (54.4%)	4723
Migration background			
No	1092 (77.2%)	5343 (69.99%)	6435
Yes	318 (22.49%)	2276 (29.81%)	2594
Vocational training			
No	1346 (95.2%)	6404 (83.9%)	7750
Yes	63 (4.5%)	1211 (15.86%)	1274
Age	20.7	20.5	20.5
Total	1402	4723	9025

Results

CFA:

- Best fit for two-dimensional model compared to one- and three-dimensional models
- Likelihood-ratio test: $Chi^2 = 4529.56$, $p < .001$

CFA results		
	Unidimensional	2-Dimensional
CFI	.729	.910
TLI	.714	.905
RMSEA	.031	.018
SRMR	.035	.019
AIC	438755.3	-4197.5
BIC	439630.0	-4520.5

Multilevel Analyses:

- On average economics students achieve 1.02 points more in the knowledge test. (if only courses of studies included in model)
  → significant influence of study domain
- This effect persists when gender, vocational training and migration background are taken into account.

Total score of relative answer frequency		
	Model 0	Model 1
Effects		
Absolute term	12.374***	10.662***
Economics student		0.561***
Gender male		2.255***
No migration background		2.567***
No vocational training		-1.108***
(Δ)AIC	52396.2	-1952.9
(Δ)BIC	52417.5	-1924.5
ICC	7,1%	

Discussion

Results confirm the discriminant validity and domain-specificity of the knowledge test:

- CFA's confirm the two-dimensional structure, indicating that the assessed economic knowledge and general cognitive abilities are empirically substantially separated.
- Business & Economics students achieve significantly better results in the economic knowledge test than Social science students.

Project partners

Marie-Theres Nagel[1], Prof. Olga Zlatkin-Troitschanskaia[1], Judith Jitomirski[2], Carla Kühling-Thees[1], Jasmin Schlax[1], Dr. Roland Happ[1], , Dimitar Molerov[2] , Prof. Dr. Hans-Amand Pant[2]

GEFÖRDERT VOM Bundesministerium für Bildung und Forschung

Further information regarding Projekt WiWiKom can be found on: http://www.wiwi-kompetenz.de

Literatur:

(1) Black, H. T., & Duhon, D. L. (2003). Evaluating and Improving Student Achievement in Business Programs: The Effective Use of Standardized Assessment Tests. *Journal of Education for Business, 79*(2), 90–98.
(2) Brown, T. A. (2006). *Confirmatory Factor Analysis for Applied Research*. New York: Guilford.
(3) Cronbach, L. J., Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological bulletin, 52*(4), 281-302.
(4) Yamaoka, M., Walstad, W. B., Watts, M. W., Asano, T., Abe, S. (2010). *Comparative Studies on Economic Education in Asia-Pacific Region*. Tokyo: Shumpusha Publishing.
(5) Zlatkin-Troitschanskaia, O., Pant, H. A., Förster, M., Brückner, S. & Fox, J. P. (2016). *WiWiKom II-Valid assessment of students` development of profession-al business and economic competencies over the course of their studies – A quasi-experimental longitudinal study*. In H. A. Pant, O. Zlatkin-Troitschanskaia, C. Lautenbach, M. Toepper & D. Molerov (Eds.), Modeling and Measuring Competencies in Higher Education – Validation and Method-ological Innovations (KoKoHs) – Overview of the Research Projects (KoKoHs Working Papers, 11, pp. 57–59). Berlin & Mainz: Humboldt University & Jo-hannes Gutenberg University.
(6) 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.
(7) Brown, T. A. (2006). *Confirmatory Factor Analysis for Applied Research*. New York: Guilford.