

Professional Knowledge in Social Science Teacher Education: Development of the SoWis-L Test

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Introduction

Assessing the professional knowledge (Shulman, 1987; Baumert & Kunter, 2006) of social science pre-service teachers is challenging, because the content knowledge (CK) comprises knowledge of various academic disciplines such as political science, economics, and sociology. Existing instruments measure only economic CK (Zlatkin-Troitschanskaia et al., 2019) or political science and pedagogical CK (Weschenfelder, 2014). Therefore, the goal of the project was to develop a time-efficient instrument for assessing the professional knowledge of pre-service teachers which takes the inter-disciplinary nature of the subject into account.

Research questions

- 1
- Is it possible to assess the CK and PCK of pre-service teachers reliably using the developed test items?
- 2
- Can expected group differences concerning academic progress and the studied school type be demonstrated (criterion validity)?

Method & Sample

Early 2017
Item development

134 Single-Choice-Items with 4 options each were developed using the matrix in figure 1

2017/18
Pilot study

n = 229 pre-service teachers, additional expert reviews for CK and PCK Items

2018 – 2020
Selection & Mainstudy

63 Items selected, based on item difficulty, item discrimination & weighted infit mean square
60min. paper-pencil-survey in social science didactics courses

Table 1
Demographics mainstudy sample

demographics	n = 374
Age (Mean)	24.79 (SD = 3.09)
Gender	58% female
Academic Background ¹	34% with academic background
Academic progress (BA/MA)	50% BA, 50% MA

¹ atleast one Parent with a bachelor's degree

Results

RQ1:
Good Weighted Mean Square (wMNSQ) for items as a whole ($0.87 < wMNSQ < 1.12$) (table 2). Sociology CK Items didn't reach acceptable reliability based on wMNSQ and EAP reliability and were excluded from further analyses.

Good EAP/PV-reliability ($\geq .70$) for three-factorial structural equation model (CK politics, CK economics, PCK). Results strongly support three-factor scaling.

RQ2:
Strongly in line with expected results (known-group validity), pre-service teachers for the academic school track (**Gymnasium/Gesamtschule**) performed better on average for all knowledge areas than those training to teach in the vocational track (**Haupt-, Real-, Gesamtschule**).
Test performance in CK politics and PCK improves between bachelor and master degree students (table 3). There is no difference in CK economics between bachelor and master degree students.

About the project

The SoWis-L test instrument is the result of a subproject of the "Professionalisierung für Vielfalt (ProViel)" project. The project was funded from 2017 until June of 2023 by the Federal Ministry of Education and Research (BMBF), at the University of Duisburg-Essen. ProViel is part of the BMBF *quality initiative for teacher education* which goals are sustainable and systematic improvements of teacher education at universities.

Figure 1
Matrix for Item Development based on ESNaS-Model (Kauertz et al., 2010)

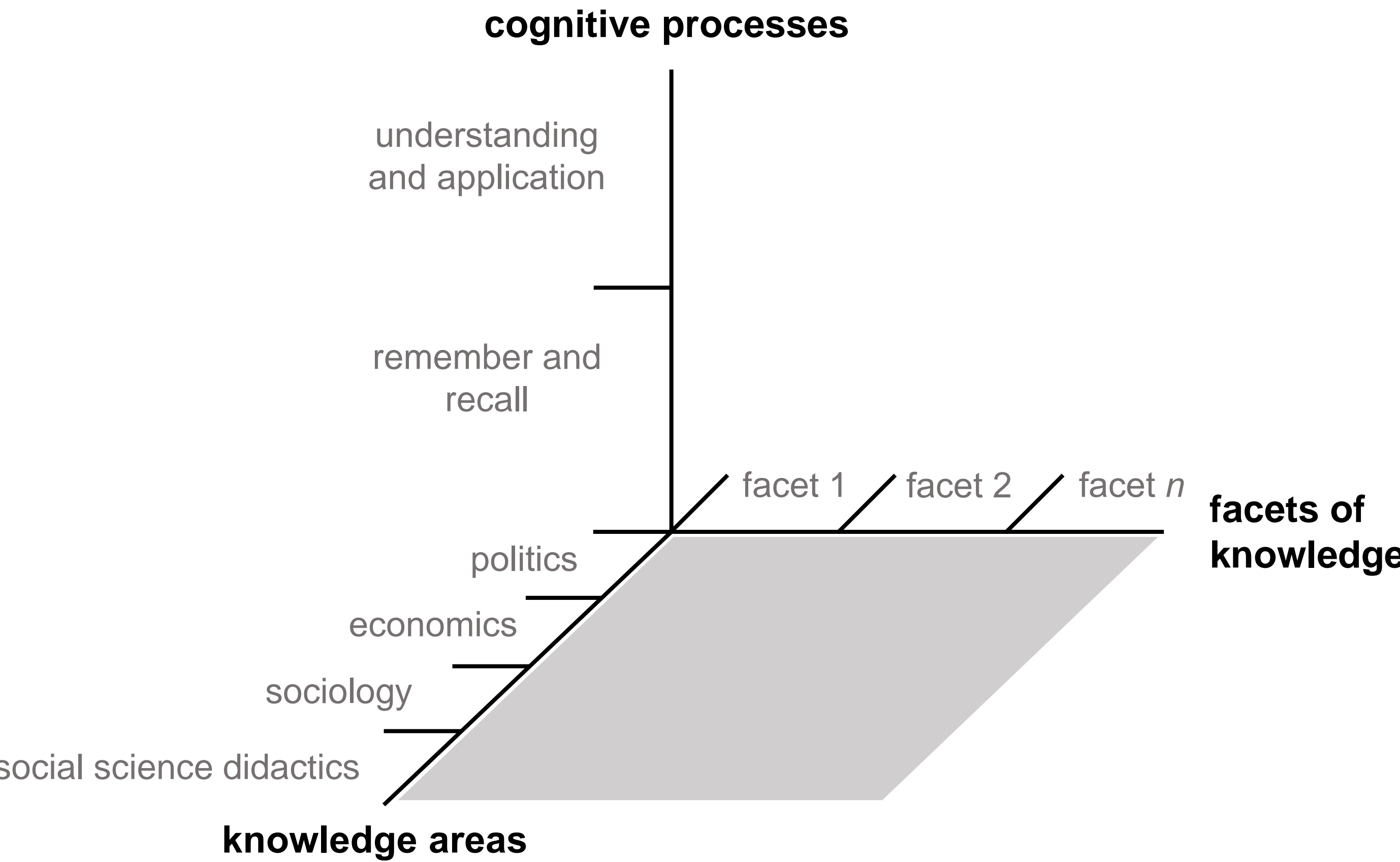


Table 2
Scaling Parameters of the SoWis-L Knowledge Test

Knowledge area	n	Number of items	EAP/PV	Variance	wMNSQ	ID (M)
Politics	371	16	.66	.99	.87–1.10	.32
Economics	370	15	.66	1.06	.92–1.12	.31
Sociology	374	17	.47	.38	.95–1.08	.19
Didactics/PCK	366	15	.60	.88	.90–1.08	.30

Note: EAP/PV = Expected A-Posteriori / Plausible Value Reliability; wMNSQ = Weighted Mean Square, ID (M) = mean value of item discrimination

Table 3
Testscore group differences between Bachelor- and Master-Students, sorted by knowledge type and studied school type (GyGe vs. HRG)

		n	M	SD	SE	t (df)	p	d
CK politics	schooltype HRG							
	Bachelor	44	43.24	10.34	1.56	2.22(74)	.015	0.52
	Master	32	48.18	8.36	1.48			
	schooltype GyGe							
	Bachelor	128	50.15	8.74	0.77	1.82(266)	.035	0.22
CK economics	Master	140	52.21	9.72	0.82			
	schooltype HRG							
	Bachelor	44	46.35	8.51	1.28	0.29(74)	.387	0.07
	Master	32	45.79	8.29	1.47			
PCK	schooltype GyGe							
	Bachelor	128	51.17	9.58	0.85	0.02(266)	.491	0.00
	Master	140	51.15	10.58	0.89			
	schooltype HRG							
	Bachelor	44	45.36	8.03	1.21	3.45(74)	< .001	0.80
	Master	32	51.95	8.51	1.50			
	schooltype GyGe							
	Bachelor	128	47.35	10.63	0.94	5.26(266)	< .001	0.64
	Master	140	53.63	8.91	0.75			

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tables and figures based on the corresponding open access publication: Gronostay, D., Manzel, S., & Zischke, F. E. (2023). Konstruktion eines Testinstruments zur Erhebung des Professionswissens von Lehramtsstudierenden im Fach Sozialwissenschaften (SoWis-L). *Diagnostica - Zeitschrift für Psychologische Diagnostik und Differentielle Psychologie*.



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