



Deutsches Zentrum für
Hochschul- und Wissenschaftsforschung ■

Measuring skill needs in a knowledge society – methods and tools from the German Graduate Panel.

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structure

- DZHW and German Graduate Panel
- Measuring skill needs I
- Measuring skill needs II – extended approach
- Relationship between skill demands and higher education

Design of the DZHW graduate surveys

DZHW

- carries out application-oriented empirical research
- two main fields: *research on higher education* and *research into the scientific world and academic organisations*

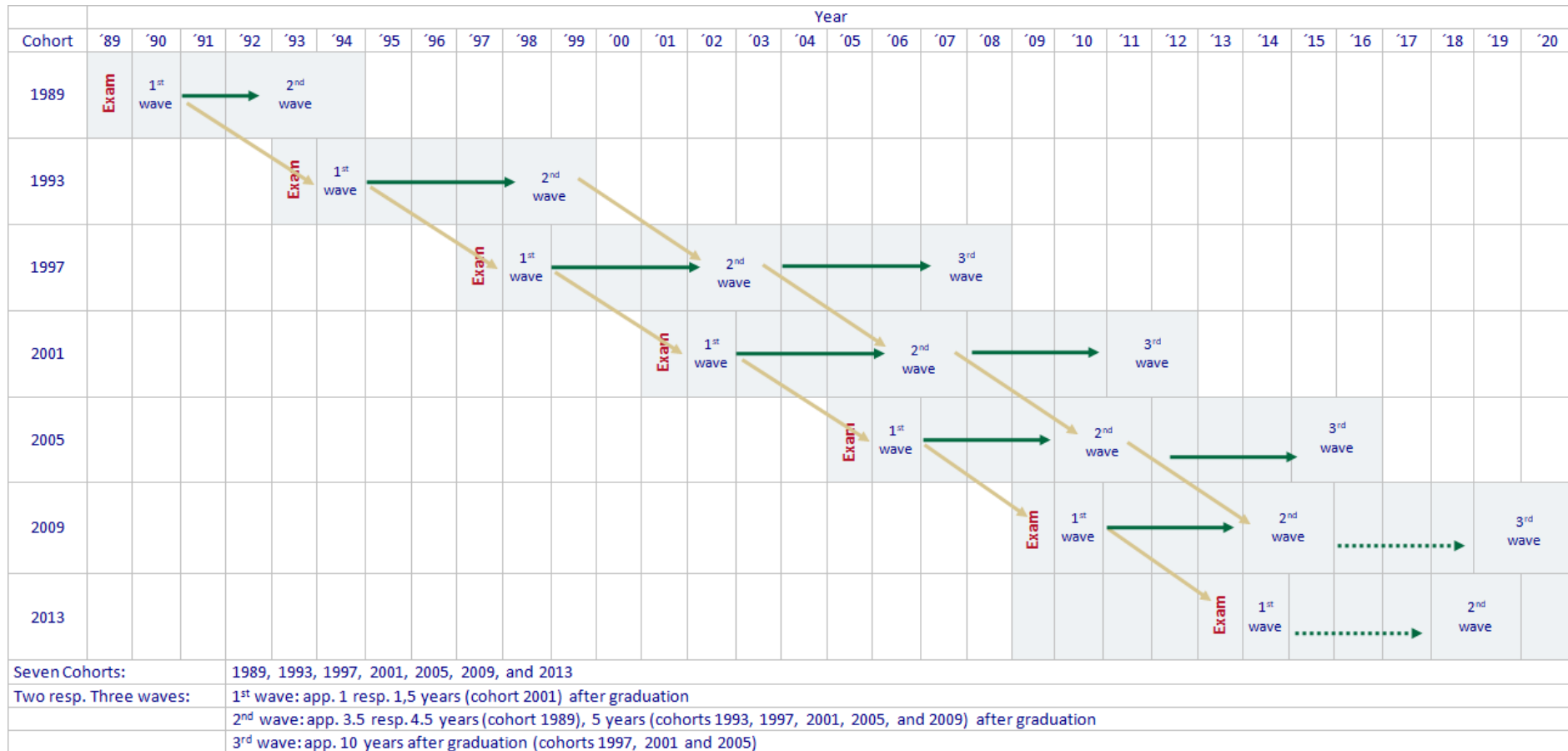
Panel and cohort design

- until now, graduates of the academic years 1989, 1993, 1997, 2001, 2005, 2009, 2013 and (soon) 2017
- up to three panel waves

Target population

- all German and non-German higher education graduates who successfully completed their first degree course or master degree
- entire range of subjects

Design of the DZHW graduate surveys



 Longitudinal analysis realised
  Analysis of trends realised
 Longitudinal analysis planned
  Analysis of trends planned

Design of the DZHW graduate surveys

Aims

- analysing the relationship of higher education and employment
- delivering representative data on a national level for all stakeholders in the education system
- having a data basis for national reporting systems (e. g. the national report on education)
- enabling estimation models (mobility, drop-out rates)
- facilitating research on graduates for other researchers

Design of the DZHW graduate surveys

Survey programme

- educational strategies, experiences, and outcomes, e.g., course of studies, academic achievement, further academic qualifications
- occupational careers, experiences, and prospects, e. g., job history (using an event-history design), job search strategies, characteristics of the jobs
- socio-biographic data and educational background
- additional topic-related surveys (e. g. work-life balance, mobility)

Design of the DZHW graduate surveys

Way of data collection

- based on a stratified random cluster sample, incl. all HEI approved by the state
- now switched to online surveys
- graduates are contacted by the HEI and get the questionnaire from the institution (due to legal constraints)

Design of the DZHW graduate surveys

Changes in the field

- parallel surveys focusing graduates (educational monitoring, quality assurance, higher education research)
- resulting problems: HEI refuse to participate in several studies
- ensure a long term protection of valuable research information

Solution

- cooperation of three institutions INCHER, *ISTAT* and DZHW
- integration of the nationwide and the institutional approach
- conclusion: more powerful towards HEI, but make compromises

Measuring skill needs I

Cedefop (2016): approaches of measuring skills

1. Qualification
2. Duration of education
3. Occupation
4. Skill tests
5. Self-assessment
6. Job-requirements

Measuring skill needs I

Cedefop (2016): approaches of measuring skills

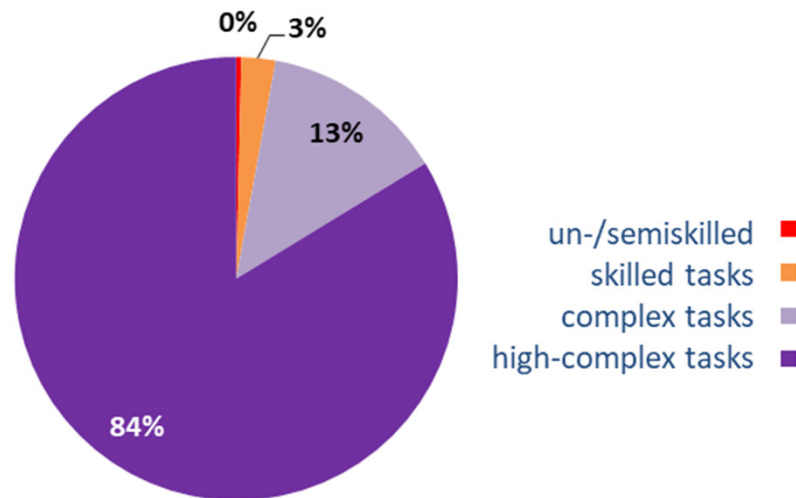
1. Qualification
 2. Duration of education
 3. Occupation
 4. Skill tests
 5. Self-assessment
 6. Job-requirements (focus: academic jobs)
- reject: *Qualification* (little variation), *Duration of education* (vague), and *Skill tests* (expensive and time-consuming)

Measuring skill needs I.1

Occupation

- German Classification of Occupations 2010 (KldB2010)
- compatible to ISCO-08
- extensive but useful work, e. g. level of complexity
- Overview: percentage of jobs with (high) complex tasks

task complexity (KldB2010)



DZHW-Graduate-Panel 2001, 3rd Wave, N=4630

Measuring skill needs I.2

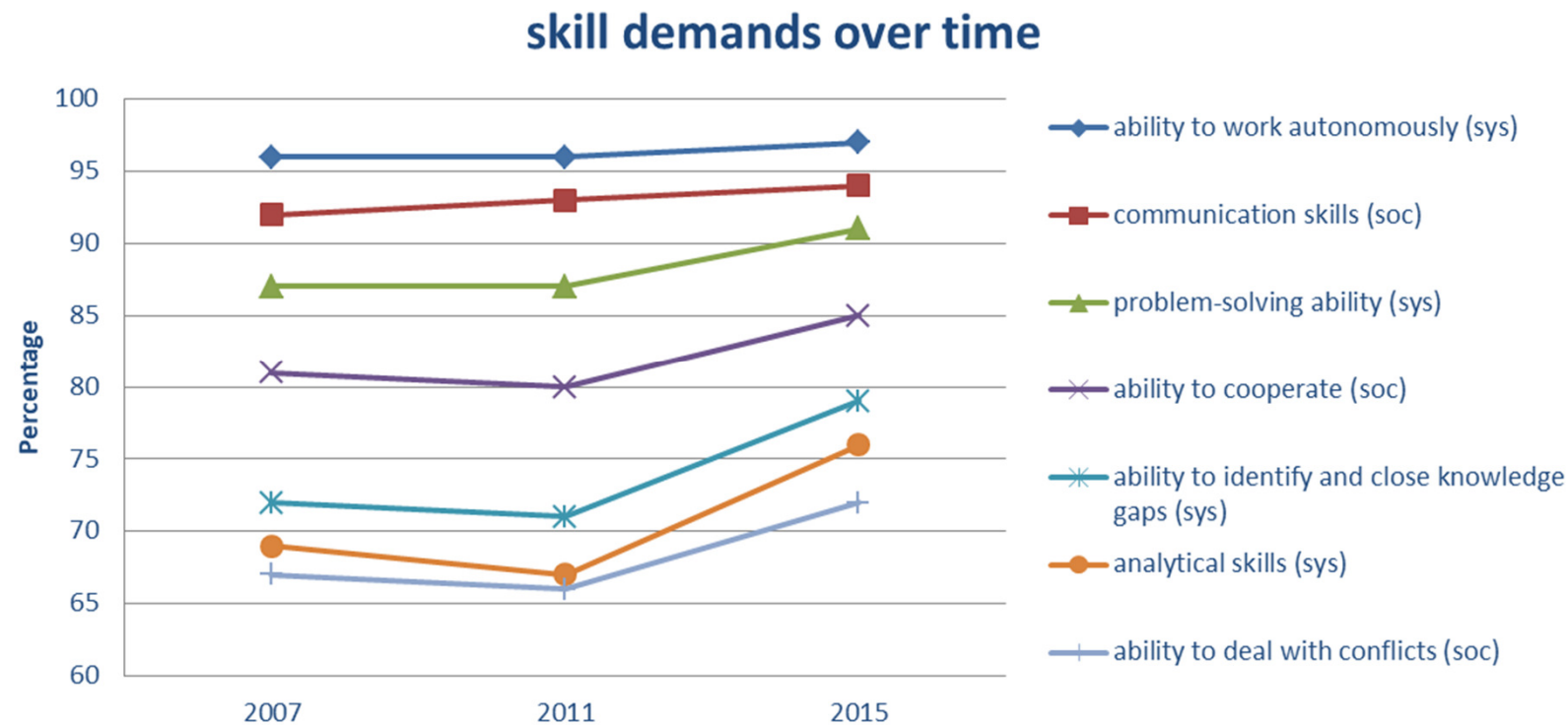
Self assessments/ job requirements

- self-reported existing and needed skills
- career development: skill needs some years after graduation (panel survey)
- selection with focus on generic competences (common for all professions)

Measuring skill needs I.2

Self assessments/ job requirements

- skills/competencies required to a (very) high extent
- already high proportion, increasing importance



DZHW-Graduate-Panels 2001, 2005, 2009, 2nd Waves, N=17.000

Measuring skill needs II

Job requirements – knowledge work

- job requirements approach (Felstead et al. 2007); assumes that work activities reflect work requirements (Brachem/Braun 2016)
- usually whole range of tasks across qualification levels – focus on highly qualified labour and knowledge work
- central ingredients of knowledge work: complexity, novelty; autonomy
- validity was assessed by factor analysis and structural equation modelling
- instrument reduced to 22 items, **innovation** (4 items), **autonomy** and **complexity** (three subscales with three items each)

Measuring skill needs II

Variable	complexity			autonomy			innovation
	dynamic1	dynamic2	variety	methods	criteria	schedule	
kom_d3	0,74						
kom_d4	0,75						
kom_d5	0,84						
kom_d6		0,76					
kom_d7		0,64					
kom_d8		0,67					
kom_v1			0,84				
kom_v2			0,72				
kom_v3			0,81				
aut_m1				0,81			
aut_m2				0,73			
aut_m3				0,80			
aut_c1					0,70		
aut_c2					0,62		
aut_c3					0,82		
aut_s1						0,79	
aut_s2						0,81	
aut_s3						0,85	
inno3							0,84
inno4							0,84
inno6							0,82
inno9							0,81
number o. c.	446						
modelfit	(RMSEA/CFI/TLI) 0,056 / 0,941 / 0,927						

HISBUS-Online-Survey 2018, N=446

- Relationship between skill demands and higher education

How to develop competences in higher education?

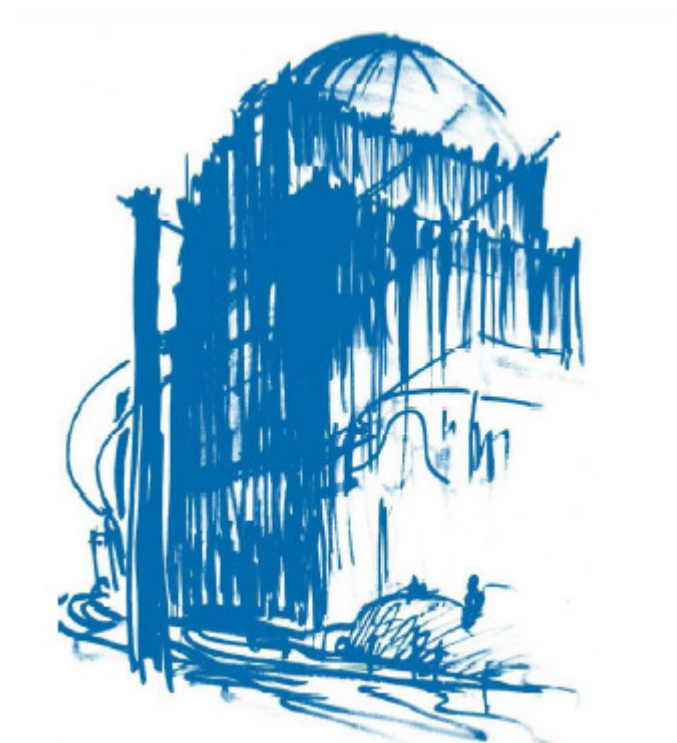
- Quality of teaching
 - *practice orientation of teaching* (4 items, e. g. learning to act professional), *academic quality of teaching* (2 items) and *interaction with faculty* (3 items) affect skills development
 - Didactic approaches to teaching
 - *activation* (index of 4 items, e. g. active participation was encouraged)
- further research needed; discussion welcome

Thank you for your attention!

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Measuring skill needs II

	complexity			autonomy			innovation
items	dynamic1	dynamic2	variety	methods	criteria	schedule	
The job requires me to respond to unforeseen situations.	0,74						
The Job requires me to react spontaneously to new information.	0,75						
The job involves me solving problems that have no obvious correct answer.	0,84						
The Job requires me to recognize potential problems before they occur.		0,76					
... to work on new tasks, which I first have to think about and familiarize myself with.		0,64					
... to make decisions with uncertain consequences.		0,67					
The job requires me to monitor a great deal of information.			0,84				
The job requires me to keep track of more than one thing at a time.			0,72				
The job requires me to analyse a lot of information.			0,81				
The job gives me considerable opportunity for independence and freedom in how I do the work.				0,81			
The job allows me to make decisions about what methods I use to complete my work.				0,73			
The job allows me to decide by my own which means to reach my goal.				0,80			
I can influence my job objectives (what I am supposed to accomplish).					0,70		
I have some control over my workload.					0,62		
The job allows me to set my own priorities.					0,82		
The job allows me to decide on the order in which things are done on the job.						0,79	
The job allows me to make my own decisions about how to schedule my work.						0,81	
The job allows me to plan how I do my work.						0,85	
I search out new solutions to problems.							0,84
The job requires me to be innovative.							0,84
I find unusual ideas and solutions.							0,82
I find out new working methods, procedures or instruments.							0,81
number o. c.	446						
model fit	(RMSEA/CFI/TLI) 0,056 / 0,941 / 0,927						

HISBUS-Online-Survey 2018, N=446

Design of the DZHW graduate surveys

Sample size

	1 st wave	2 nd wave	3 rd wave
Cohort 1989	12,164	8,163	no 3 rd wave
Cohort 1993	11,167	6,734	no 3 rd wave
Cohort 1997	9,586	6,220	5,477
Cohort 2001	8,130	5,426	4,734
Cohort 2005	11,786	6,459	4,279
Cohort 2009	10,173	5,115	–
Cohort 2013*	16,008	–	–