

# Learning to Teach *Sachunterricht* – Development of Prospective Teachers in Germany

Sarah Rau



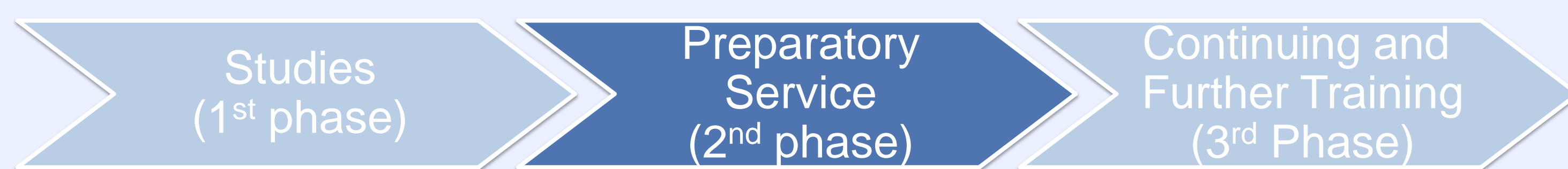
UNIVERSITÄT  
DUISBURG  
ESSEN

*Open-Minded*

## Development of Occupational Skills in Practical Phases

### German Teacher Education (Kodron, 1994; Viebahn, 2003)

- focus on practical training
- teaching under guidance as well as autonomously
- teaching observations by educators in every subject



### Practical phases effect...

- ... secondary school teachers' knowledge and beliefs (Schmidt et al., 2007)
- ... confidence and general teaching abilities (Niemi, 2011)
- ... quality of teaching, however not every aspect seems to develop equally (Baer et al., 2011)

### Research Questions

How does the quality of teaching the subject *Sachunterricht* (SU) develop over the time of the second phase of teacher education

- ... in general?
- ... with regard to the several criteria for good SU-lessons?

## Defining Quality of Teaching *Sachunterricht*: Development and Validation

### Good Lessons

- Helmke, 2003; 2009
- Meyer, 2004; 2007

→ merging general lists of criteria to non-overlapping criteria

### Educational Aspects of SU

- GDSU, 2013
- Kahlert, 2009
- ...

→ matching subject specific statements to the criteria

### Good SU

- List of criteria with facets, describing good SU:
  - structuring & organising level: classroom management, clarity & structure, arrangement of the learning environment
  - individual level of students: activation, supportive classroom climate, handling heterogeneity

- step 1: content discussion of each criteria (3 researchers in SU)
- step 2: expert rating of the manual to examine content validity (7 teacher educators, 10 researchers in SU)
- step 3: optimisation of the manual
- step 4: interrater agreement of each criterion (2 trained raters, 6 videotaped lessons):  $.571 < \kappa \leq 1.0$

## Developing a Manual

## Measuring and Rating

## Observing the Processes of Development

## Design

- ✍ lessons of the prospective teachers
- ✍ self-evaluation by the prospective teachers
- ✍ evaluation by the mentoring teachers
- ✍ evaluation by the teacher educators

05/2014 T1 T2 T3 10/2015

T = time of measurement

Further variables of interest:

- educational background
- teaching experience (e.g. extra-curricular practical trainings, part time jobs), interests in natural and social sciences

## Video-Study: Conduction & Units of Analysis

- conception of qualitative content analysis for video analyses (Mayring, Gläser-Zikuda & Ziegelbauer, 2005)
- deductive category application with definitions, examples & coding rules (Hugener, Pauli & Reusser, 2006; Mayring, 2000)

### 1<sup>st</sup> watching the whole video

- ... getting an overall impression
- ... rating onetime facets (e.g. social arrangements)
- ... analysing additional material (e.g. copies of working sheets)

### 2<sup>nd</sup> watching the video in sequences

- 5-minutes-sequences
- ... event-sampling (e.g. disturbances)
- ... analyzing each facet (all criteria at once)
- ... final over-all ratings (e.g. contribution to mistakes)

## Results of 1<sup>st</sup> Time of Measurement

- sample: 12 prospective teachers  
83,3% female; 25,5 years old ( $SD = 1,168$ )
- analyses of  $n = 12$  videos
- teaching experience:  
91,7% taught SU during their studies
- Prospective teachers at the beginning of teacher training implement aspects of structuring and organising a SU-lesson more (fig. 1) than aspects concerning the individual level of students (fig. 2).

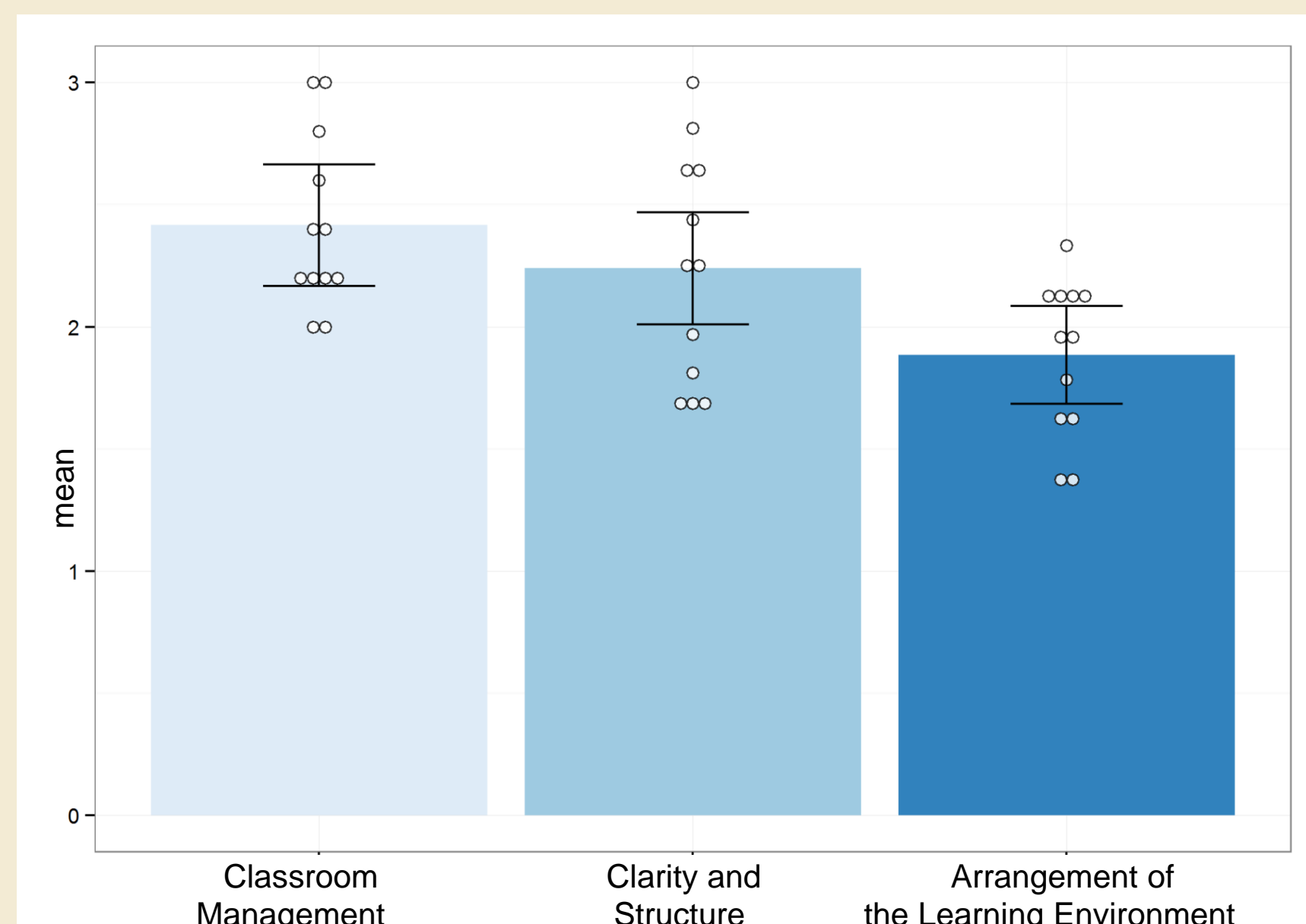


Fig. 1: Means of the criteria with aspects of teaching on the structuring and organizing level

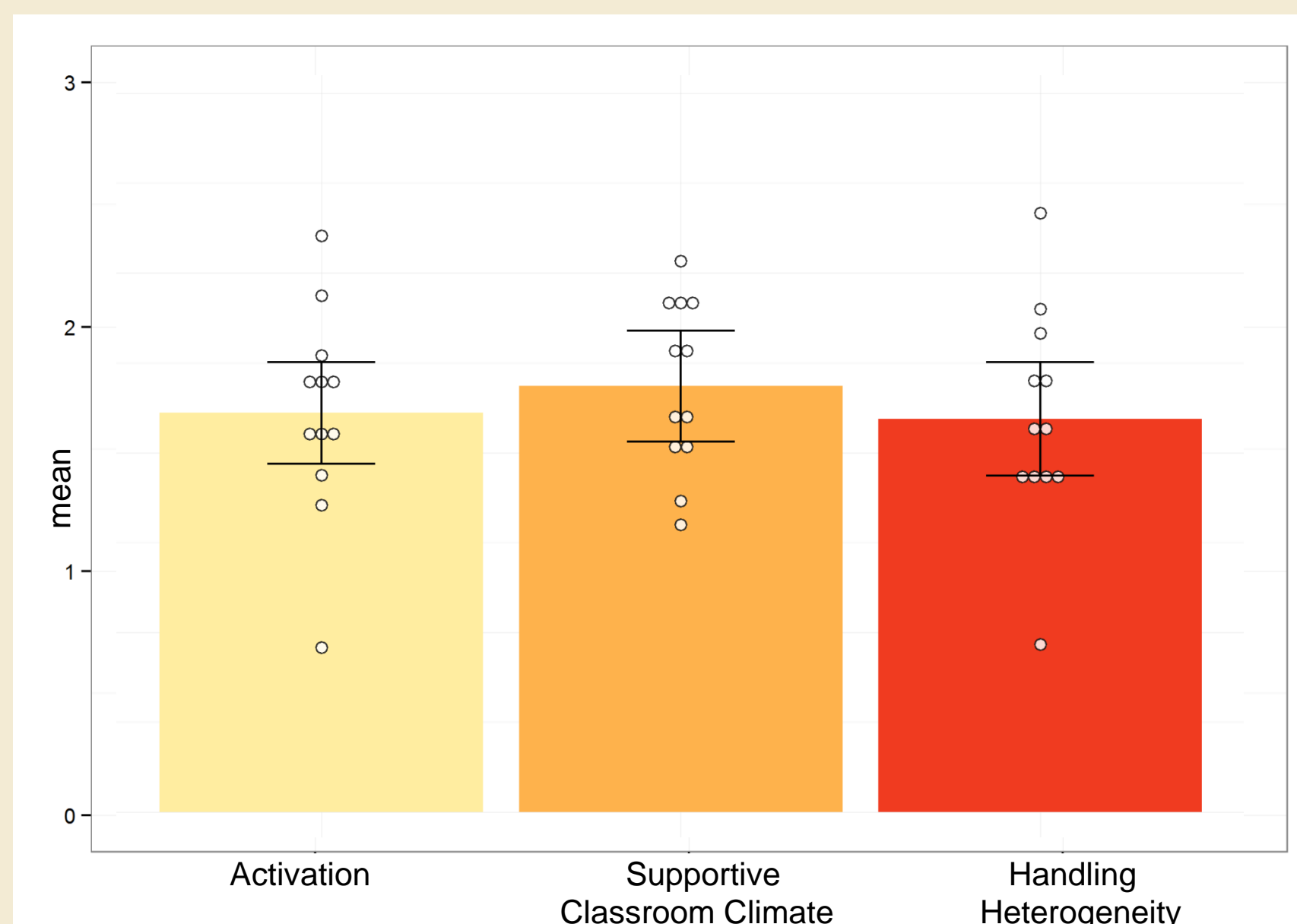


Fig. 2: Means of the criteria with aspects of teaching on the individual level of students

- Aspects of structuring and organising cover more than half of the total score (fig. 3).

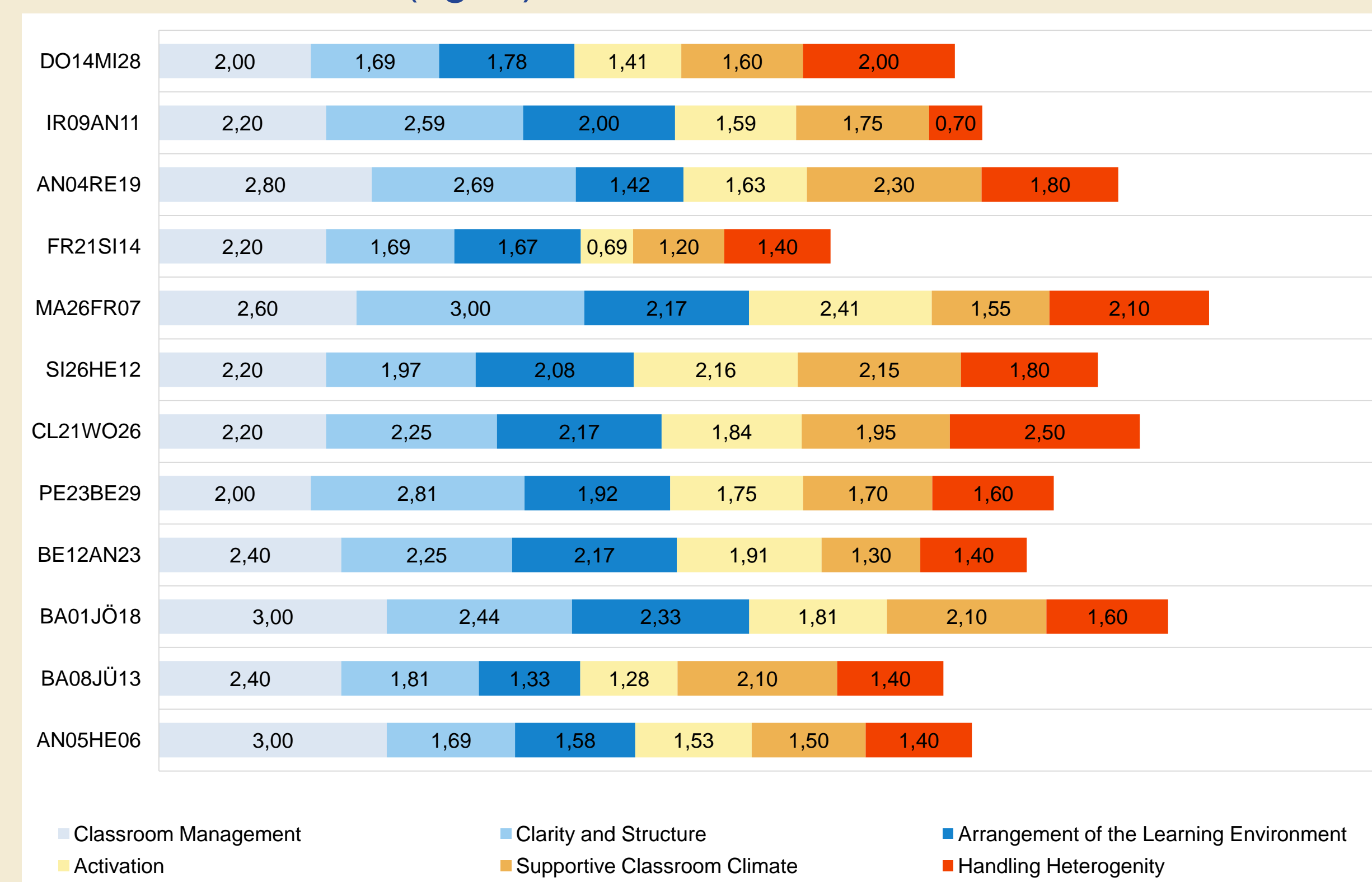


Fig. 3: Added means of the criteria of each prospective teacher

## Outlook

### Upcoming Analyses

- Analyses of variance of the 3 times of measurement to show the development in general and with regard to the several criteria for good SU-lessons
- Further case-by-case-analyses to identify different types of development
- Interviews with teacher educators to identify their personal view what constitutes a good SU-lesson

### Further Results of EuLe:

Please have a look at the poster of Anna Hasenkamp (Summer School Posters, Session 6)

### References:

Please have a look at the back of the handout.



Sarah Rau

University of Duisburg-Essen  
Chemistry Education, Institute for Sachunterricht  
Schuetzenbahn 70, D-45127 Essen, Germany  
mail to: sarah.rau@uni-due.de

Internet: www.uni-due.de/isu

### Contact