Teaching Climate Change: Knowledge, Beliefs and Challenges of Primary-School Student Teachers

DOI: https://doi.org/10.5281/zenodo.7016596

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Theoretical framework

Theoretical framework: Climate Change is one of the biggest challenges of our times (IPCC, 2014). Hence, it is necessary for learners at all school levels to deal with questions and problems of their present and future environment, also in the context of Climate Change Education. It is thus the responsibility of schools to help pupils building up an understanding of complex interrelationships as well as to enable them to deal with the related challenges in a responsible way and to act in a reflective manner. At the same time, pupils are interested in this topic and bring questions into the classroom (Adamina et al., 2018). Despite the learner's interests and the high educational contribution to current societal and educational policy needs, climate education is (often) not an integral part of teaching in the classroom and teacher-training (Cross & Congreve, 2020; Wise, 2010), although knowledge of key aspects of the topic can already be built up at primary-school level (Adamina et al., 2018). Facing the complexity of the issue within a controversial political and cultural context is perceived as a major challenge by (prospective) teachers (Monroe et al., 2019; Reid, 2019; Wise, 2010) and some teachers argue that dealing with the issue is too emotionally stressful for children (Rieß, 2010).
How requirements are perceived under the influence of various factors is important for the professionalisation of (future) teachers (Keller-Schneider, 2020). The extent to which this also applies to the readiness of the student teachers to teach Climate Change is investigated in this study.

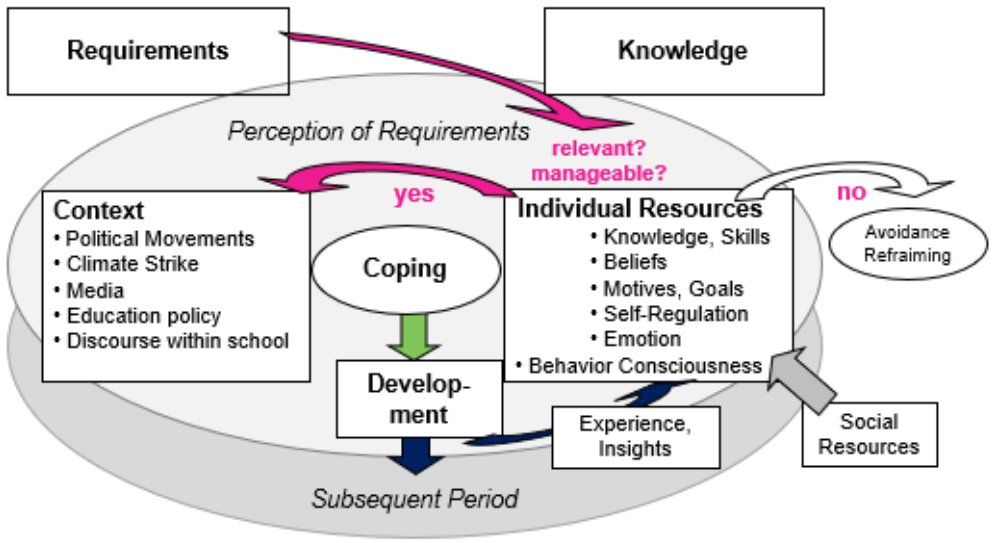

Fig. 1: Framework of development of pedagogical professionalism (Keller-Schneider 2020, p. 151), differenciated according to topic

Theoretical foundation: According to the biographic approach of teachers' professional development (Keller-Schneider, 2020), as summarised in the framework of development of pedagogical professionalism (Fig. 1), professional requirements are perceived and interpreted by individual teachers based on their individual resources and their (professional) socialisation. The extent to which requirements are accepted and dealt with as challenges arises from the interaction of knowledge and skills, beliefs, goals, motives, personality traits and self-regulation.
If requirements are perceived as relevant and manageable available resources (stress-theoretical approach of Lazarus), they are accepted as challenges. This leads to further development and enables new experiences and knowledge. The knowledge gained from these experiences is integrated into the subjective structures and contributes to the development of competence and further professionalisation. The associated demands require resources to cope with on the one hand and contribute to the development of new resources on the other (Hobfoll's stress-theoretical approach).

Goals

Based on Keller-Schneider's (2020) perception-based professionalisation approach, grounded in stress and resource theory, a multi-method study examines the extent to which specific components of individual and contextual resources are relevant to prospective primary teachers' intentions to teach Climate Change. The following questions will be investigated:

- What prior knowledge and what attitudes (individual resources) do the student-teachers have at the beginning of the course and what types can be identified? (Data basis: questionnaire, pre-survey)
- Which requirements are perceived as a challenge by the student-teachers, to what extent are contextual factors and social resources relevant and to what extent does this requirement, perceived as a challenge, lead to an intensive dealing with the topic of teaching Climate Change? (Data basis: Interview)

Design

The longitudinal study is based on the topically differentiated framework model of the development of pedagogical professionalism (Fig. 1) and uses quantitative and qualitative methods to determine aspects of knowledge, attitudes/ beliefs as well as the perception and interpretation of requirements of student teachers for teaching Climate Change. The part of the course took place in the spring semester 2020 at the Zürich University of Teacher Education and consisted of an approximately ten-hour online-based teaching unit on "Teaching Climate Change", was framed by a questionnaire survey (pre-post design). Guideline-based individual interviews followed after the course (Fig. 2).

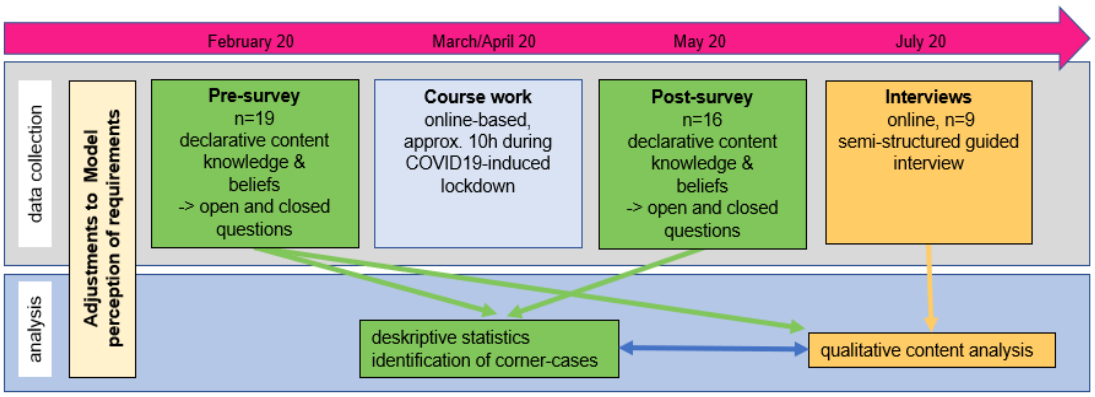

Fig. 2: Design of the study

Instrumentes and Analysis

Access	Construct	Sub-categories	Data collection	Data	Method
Questionnnennaire	Content Knowledge	Causes	Open answer format	Qualitative	Qualitative conent analysis
		Consequences			
		Measures			
		Seven questions on concepts on the greenhouse effect	Binary (right/wrong)	Quantitative	Descriptive statistics Identification of corner cases
	Beliefs	Engagement with Climate Change in leisure time	4-level Likert scale	Quantitative	
		Relevance of knowledge about Climate Change for teachers			
		Interest in politics			
		Enjoyment to teach Climate Change			
		Climate-related lifestyle			
		Knowledge about Climate Change			
		Commitment to climate protection			
		Should Climate Change be taught at primary level?	Open answer format	qualitative	Qualitative conent analysis
Interview	Perception and interpretation of requirements	Requirements	Guideline-supported	Qualitative	Qualitative conent analysis
		Beliefs, values, attitudes, interests, goals, emotions			
		Content knowledge und pedagogical content knowledge			
		Role of the teacher			
		Context, social resources			
		Experiences			
		Changeability over time			

Fig. 3: Methodological approaches of the sub-studies at a glance

References

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Poster presented at EARLI, 25 August 2021