Abstract: The potential and limitations of self-regulated learning for the development of digital competences in teacher training and implications for (Basic) Digital Education

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1 Introduction

As digitalization presents us with new challenges and opportunities, education systems need to equip citizens with the knowledge and skills needed for modern life [1]. This – of course – means that teachers need to be not only equipped with these competences for their professional tasks but also that they can pass them on to their students [2]. Furthermore, they have to be able to adapt and react to the fast-paced developments in technology, which poses challenges in teacher education [3].

2 Research Questions

The following research questions are posed:

1. Which AI-related competences beyond those in DigComp and DigCompEdu do teachers indicate to need?
2. How do secondary level teachers currently go about acquiring the AI-related competences they identify as necessary?
3. Which approaches for the development of professional digital competences of secondary level teachers entailing self-regulated learning are reflected in international literature?
4. How do (pre-service) teachers perceive and evaluate dig!self, a prototypical framework for supporting self-regulated learning of professional digital competences in an institutional context?

3 Methodology

The project is structured around the Design Thinking approach as described by Tim Brown [4], Rachel Clarke [5] and Teun den Dekker [6]. The approach is ideal for dealing with complex "wicked problems" for which there is no single perfect

solution and where numerous interventions can improve the situation through a combination of creative processes and data-driven work. The process is split into three overlapping circular phases: Inspiration, Ideation and Implementation [4–6]:

Phase	Research Question	Methods
Inspiration	RQ 1	Interviews [7, 8], Thematic Analysis [9]
Inspiration	RQ 2	Interviews [7, 8], Qualitative Content Analysis [10]
Inspiration, Ideation	RQ 3	Systematic Literature Review [11]
Ideation, Implementation	RQ 4	(Ideation Techniques [6]), Action Research [12]

4 Related Work

Self-Regulated Learning has been shown to be effective and often necessary in teachers' professional development of Digital Competences [13]. Tested approaches include Personalized Learning Environments [14] and utilizing metacognitive questions [15].

5 Results So Far

At this point, major findings of the project are that there is a set of AI-related competences distinct from but closely-connected to digital competences that teachers indicate to need and report developing largely in a self-regulated manner.

Furthermore, a number of approaches for fostering the self-regulated digital competence development of digital competences has been identified (see related work) and a prototypical draft of the dig!self framework consisting of a digital support platform, resources and course sequences has been developed based on those insights.

6 Open Questions

- How can I go forward with Ideation effectively?
- How do I effectively deal with the scope of the project expanding?
- What other pitfalls could there be in a Design Thinking project?

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