

Developing Teachers as Computational Participants

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Context

In Australia, the Digital Technologies subject area has recently been introduced as part of the national curriculum, which will involve the compulsory teaching of the *core CS skills* (*computational thinking, computer programming and systems thinking*) to all students from the first year of schooling (Foundation) to their ninth year (Year 8).

Introducing the compulsory teaching of the *core CS skills* presents a major challenge for teachers, particularly for those that teach at a primary school level. The majority of Australian primary school teachers are generalist teachers (Vivian, Falkner & Falkner, 2014) and are unlikely to have learned about the *core CS skills* in their formal education.

Professional development (PD) programs, such as face-to-face workshops and online courses, have been developed as one approach to address this challenge. However, there is currently limited research into the effect of these programs on teachers' knowledge of the *core CS skills*, their self-efficacy towards learning and teaching these skills, and the pedagogical practices teachers use to impart these skills, particularly in the Australian context.

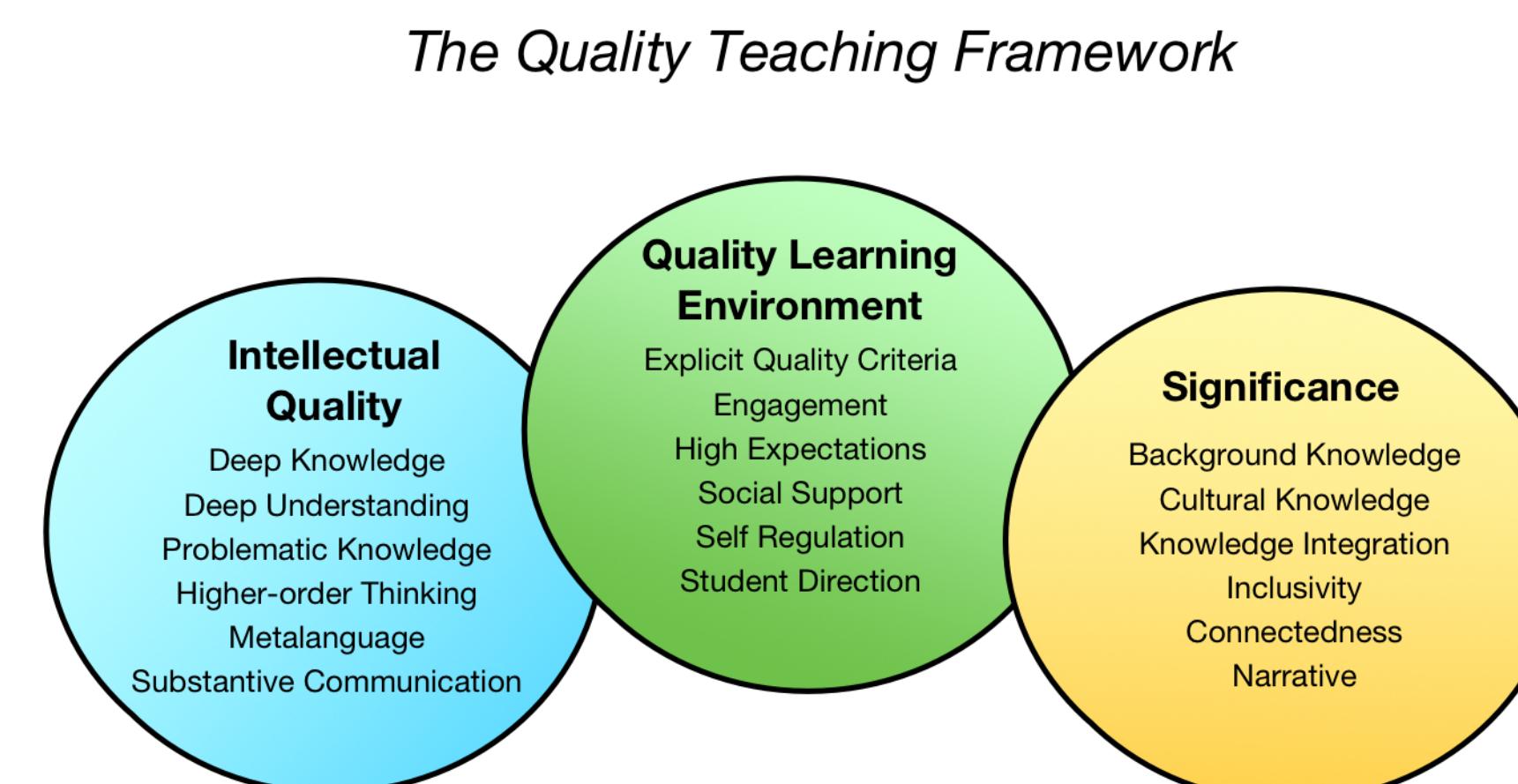
To read the complete doctoral consortium submission (as a PDF), go to hckmd.com/icer or use the following QR code:



Theoretical Framework

This research project involves the integration of two theoretical frames: the *Quality Teaching Framework* (NSW Department of Education and Training, 2003), and *Computational Participation* (Kafai & Burke, 2014).

The *Quality Teaching Framework* (NSW Department of Education and Training, 2003) is a validated model for examining teachers' pedagogical practices, which can be used to assess the quality of teachers' pedagogical practices and as a tool for self-reflection and improvement.



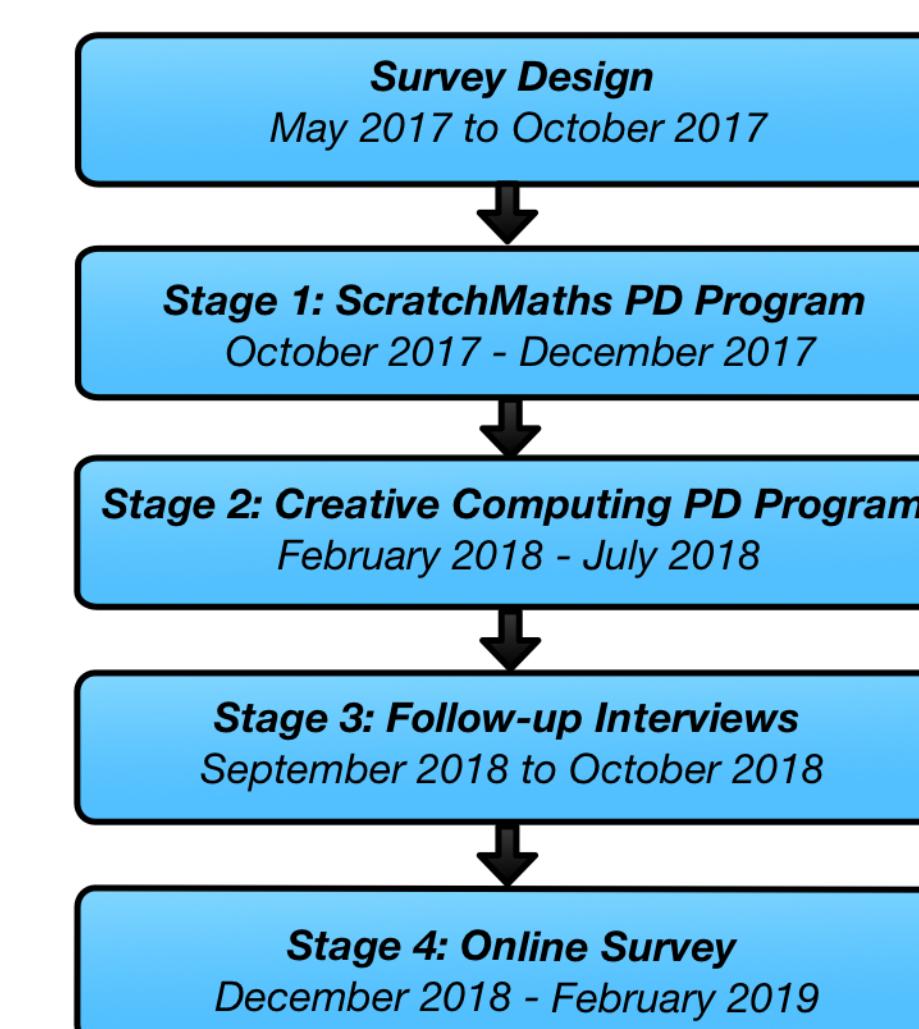
Computational Participation is a theoretical frame for teaching and learning computer programming, which was introduced in the book *Connected Code* (Kafai & Burke, 2014). In *Connected Code*, Kafai and Burke argue that students should not be taught computer programming solely with the aim to develop them as logical and rigorous *computational thinkers*, but instead with the aim to develop them as *computational participants* who understand the technical, social and cultural aspects of computing.

The design of the *Computational Participation* frame has been influenced by the *Constructionism* learning theory (Harel & Papert, 1991), which also underpins this project's theoretical framework. The central assumption of *Constructionism* is that students learn best when they construct physical and/or digital artefacts that can be shared with others.

Research Questions

1. What are the levels of knowledge, self-efficacy and perceived pedagogical practices of Australian Primary School teachers, with respect to the Core CS Skills?
2. To what extent does Australian Primary School teachers' knowledge, self-efficacy and pedagogical practices, with respect to the Core CS Skills, change as a result of completing a professional development program developed with computational participation as a guiding framework?
3. How do Australian Primary School teachers experience the elements of computational participation when taking part in the professional development program and when applying ideas from the program in their classrooms?
4. What challenges do Australian Primary School teachers encounter in their classroom experiences of implementing the Digital Technologies curriculum?

The Planned Stages of the Research Project



References

- Harel, I. E., & Papert, S. E. (1991). *Constructionism*. Ablex Publishing.
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