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Learning and teaching science in an online world: An exploration of pedagogical and curriculum innovations afforded by the 1 to 1 lap top program in lower secondary science classrooms

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Edith Cowan University
School of Education

Learning and teaching science in an online world

An exploration of pedagogical and curriculum innovations afforded by the 1 to 1 lap top program in lower secondary science classrooms.

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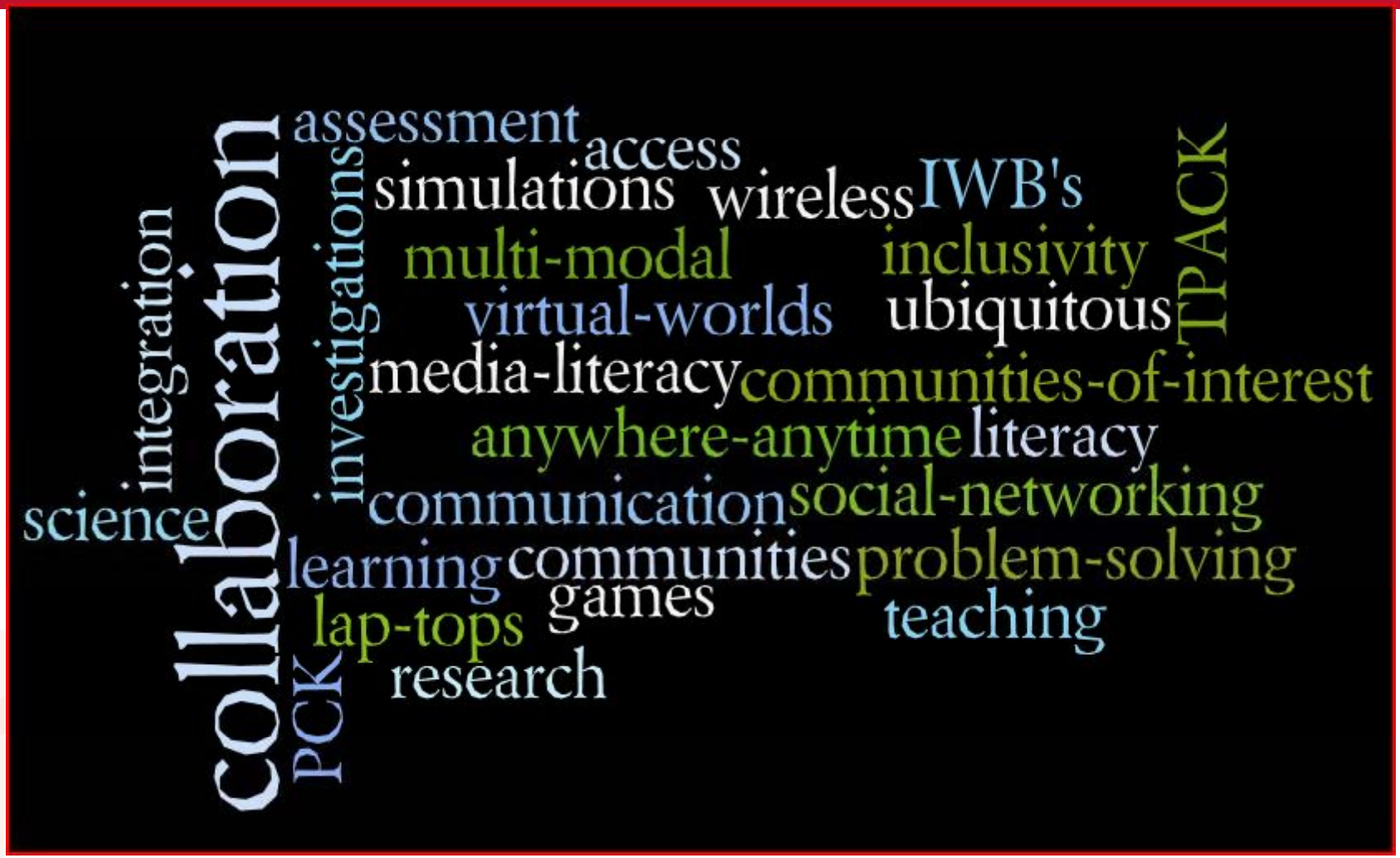
WHAT GOT ME THINKING

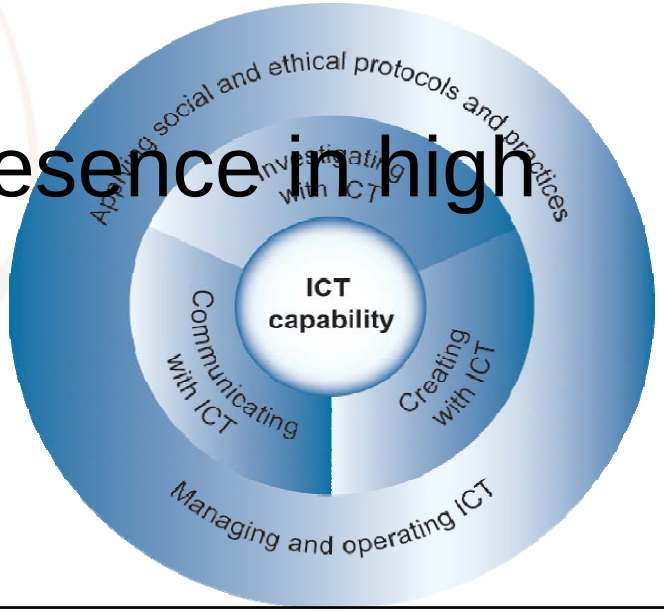


BACKGROUND

- Digital Education Revolution (*DER)* has resulted in $1.2 billion Federal investment in the technology infrastructure of Australian schools.
- *The National Secondary School Computer Fund* (NSSCF) has resulted in approximately one million students in Years 9 to 12 across the country with access to their own personal lap top computer.

BACKGROUND

- *Australian Institute for Teaching and School Leadership (AITSL) National Professional Standards for Teachers* explicitly documents the required use of digital technologies for teaching and learning .
- ICT now has a ubiquitous presence in high schools



This diagram shows the organisational elements of ICT competencies as outlined in ACARA

PROBLEM

- Teachers are being constantly challenged to integrate technology into their classroom
- However, technology integration is a complex task requiring technological knowledge, time, resources and motivation.
- There is now an urgent need for science teachers with technological pedagogical content knowledge (TPACK).

PURPOSE

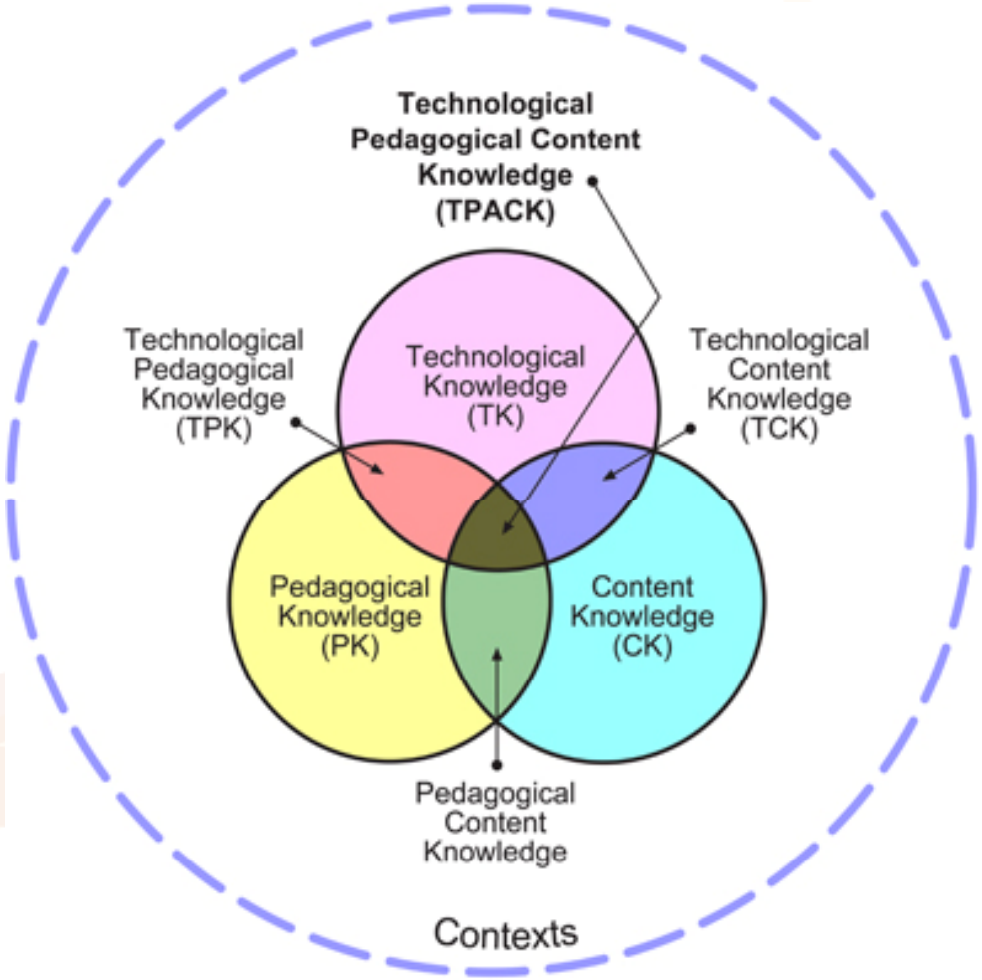
- This case study will investigate how teachers (identified as having TPACK) are exploiting the affordances of the lap top so that their students can:
  - access science ideas;
  - create;
  - problem solve;
  - communicate;
  - and work collaboratively with others

CONCEPTUAL FRAMEWORK

❑Technological Pedagogical Content Knowledge (TPACK) Framework by Matthew Koehler & Punya Mishra (2006)

- The TPACK model has been strongly influenced by the theoretical learning model of social constructivism
- The authors of this model argue that there has been an over emphasis on the use of ICT rather than focussing teacher professional development around how to use ICT effectively with students for learning

CONCEPTUAL FRAMEWORK



RESEARCH DESIGN

- Qualitative research methodology
  - Case study of 3-5 metropolitan high school science teachers
  - Pre and post lesson teacher interviews
  - Classroom observation
  - Video capture practice and analysis

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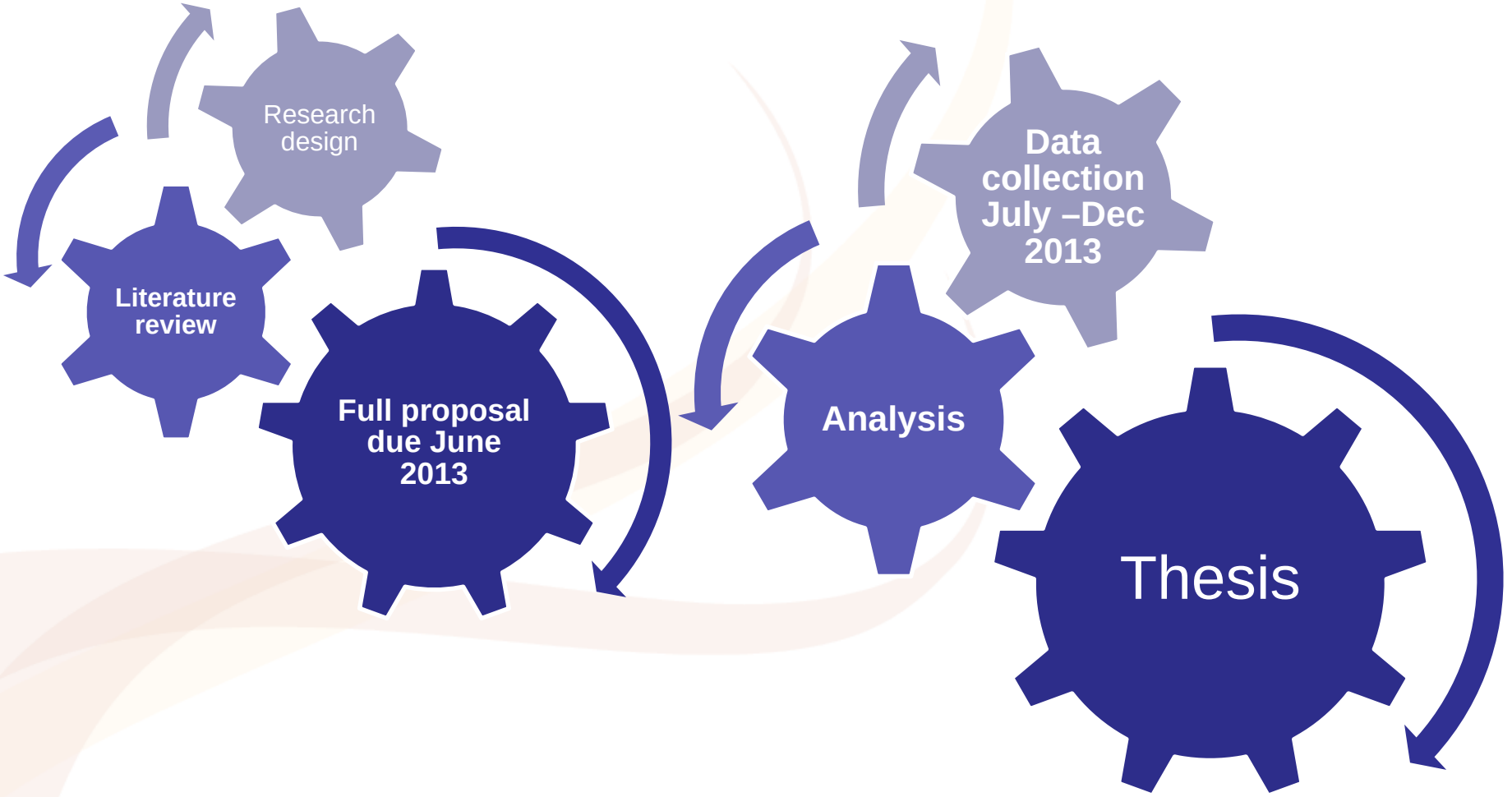
WHERE TO FROM HERE?