TEACHING & LEARNING RESEARCH INITIATIVE
NĀU I WHATU TE KĀKAHU, HE TĀNIKO TAKU

Experiences and reflections of teachers on the use of mixed reality technologies to foster cross-curricular learning opportunities

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Project description

This pilot action research project was a teacher-driven investigation into how innovative technologies can support cross-curriculum learning. The study adopted a participatory design and research methodology to explore teachers' experiences of how mixed reality (MR) can be incorporated across subject areas, with a focus on the creation of digital artefacts in authentic contexts.

Aims

The primary research question driving the project was: **How can digital technologies, specifically mixed-reality (MR) tools, be adopted to facilitate learning across the curriculum?** To answer this question, four sub-questions were also identified:

a) How can teachers be stimulated to enhance learners' co-constructive activities and support cross-curricular activities?

b) How can learners be involved in, and take responsibility for, the construction of their own learning artefacts (as opposed to just using pre-given learning artefacts)?

c) What are the barriers and enablers for the integration of MR to support a range of learning outcomes across subjects?

d) How effectively can this approach be adopted in other schools?

Why is this research important?

The integration of digital skills across the curriculum has been shown to provide improved engagement and outcomes for all students. However, learners have often been consumers of digital content rather than developers. Learning through artefact creation can address a wider set of learning outcomes, but this requires a more complex set of skills and competencies from both teachers and learners. This research focused on how we can better support and guide teachers to integrate digital creativity across disciplines. The outcome of this research was a framework which will be used to support other schools wishing to better integrate digital technologies (DT) across the curriculum.

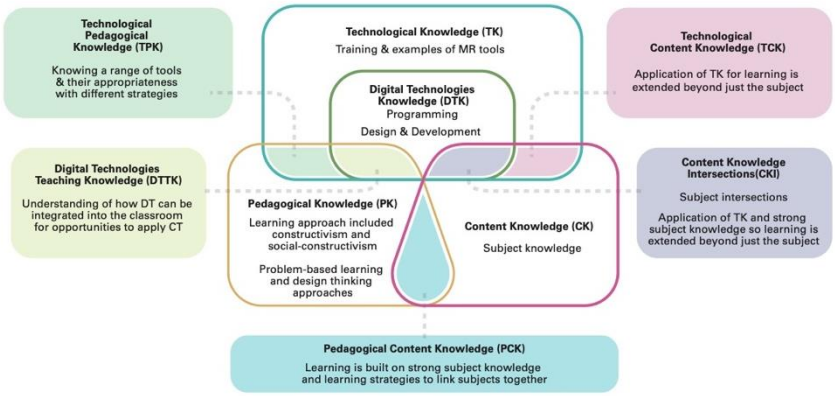

Fig 1. Extending the TPACK framework with Digital Technologies Teaching Knowledge (DTTK) and subsequent Content Knowledge Intersections (CKI).

Key findings drawn from the research questions

a) By focusing on supporting teachers to explore DT and identify appropriate knowledge intersections (Fig 1), we can improve the integration of DT across subjects. While training and support are instrumental in facilitating this exploration, the establishment of Communities of Practice can provide the requisite ongoing support.

b) MR technology can be integrated in a variety of different ways. Approaches such as problem based learning (PBL) and more discrete approaches, drawing on concepts of constructionism, provide new ways for contextualising diverse subject knowledge.

c) The various affordances of MR enabled learning that was student focused, supported new opportunities in real-world learning, and fostered collaboration.

d) Barriers were identified that included the need to focus on supporting teachers' DT and Content Knowledge Intersections and helping students to scaffold their own learning. While providing access to technical support and resources is a starting point, schools need to develop a culture of innovation to encourage buy-in, including structural and policy changes to transform learning.

e) Adopting an ecological framework (Fig 2) can help schools to adopt this approach, providing a holistic view of the interrelated factors that support the integration of MR.

Implications for practice

The development of digital artefacts, to support the development of digital skills and cross-curriculum learning, does not have to be confined to the digital technologies' classroom.

- More support is needed for teachers to explore and integrate digital technologies across the curriculum.
- Enabling teachers to develop a community of practice, collaborate between subjects, showcase examples and share resources is important for long-term innovation and integration.
- Ongoing adoption requires a change in the structure of schools, along with a culture change that makes these approaches a priority.

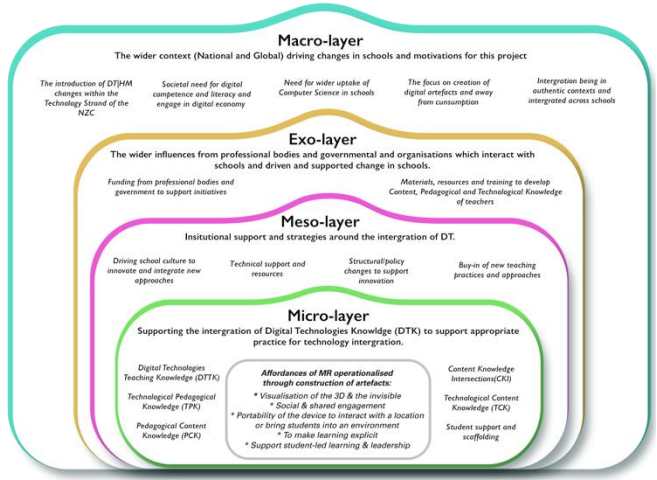

Fig 2. The ecological framework of the factors that facilitate learning across the curriculum.

Our partners:

We would like to thank the teachers that participated in this research from Napier Girls High School and Tamatea High School.

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