# On2Science – Multiple affordances for learning through online citizen science

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TEACHING & LEARNING RESEARCH INITIATIVE

**Introduction**

Online citizen science (OCS) projects invite volunteers to contribute to science projects by collecting and/or processing data – with some or all parts of the project occurring via the Internet.

Across the project, teacher-researchers used OCS projects as a fulcrum in curriculum planning, resulting in 16 classroom interventions. The aim was to investigate:

- Progress indicators in students' science capability development
- Opportunities for DT learning
- Impacts of human-computer interactions (HCI)

**Findings 1: Progress indicators for the science capabilities**

When science capabilities are a specific focus of carefully orchestrated teaching and learning, students demonstrate progress at higher levels have been previously identified by the National Monitoring Study of Student Achievement.[1]

For example, Year 4-6 students can:

- Notice patterns in data and ask questions about the patterns
- Explain the importance of data collection protocols
- Show persistence, perseverance, and a commitment to accuracy when collecting and interpreting data
- Identify and use evidence, including disconfirming evidence
- Critique evidence
- Take action in response to scientific issues

[1] Ministry of Education. (2019). *Science in the New Zealand Curriculum. Understanding Progression Level 1-4*.

**Findings 2: Science-DT curriculum integration**

We identified four models for science and DT curriculum integration:

- Science and DT taught separately and then combined in a digital output (DDDO)
- Science is foregrounded and DT showcases science learning
- Science provides the context for DT
- Science and DT taught alongside each other

The project's community of practice supported teacher-researchers to develop their own confidence and capability teaching DT.

IMPACT

"[I was surprised by] the depth of learning and scientific capabilities that very young kids are capable of, given the right teaching and opportunity." (Teacher-researcher questionnaire response)

"Ripple effects are hard to measure. I have involved colleagues in the project, invited other classes to join my class for lessons, and have team-taught and modelled science lessons with other colleagues." (Teacher-researcher questionnaire response)

"This was my first instance of collaborative research and so it's really set the tone for me. It was cross-disciplinary and practitioner oriented." (Research assistant questionnaire response)

**Findings 3: Human-computer interactions (HCI)**

- Teachers need to plan for students to develop specific DT skills
- Sharing devices facilitated peer talk and learning discussions
- OCS projects need to be carefully selected for their affordances for supporting specific learning outcomes
- Teacher scaffolding enhanced the value of using OCS projects for learning
- Modelling enhanced students' understanding of how some OCS data were collected
- Engaging with OCS project scientists enhanced student engagement in, understanding of and commitment to the OCS projects


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