Science and Technology Learning

Innovation in Agriculture

Kaikorai Valley College (TLIF 1-036)

For the Ministry of Education
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Project title:
Science and Technology Learning Innovation in Agriculture

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Research reports are available on the Ministry of Education’s website
Education Counts:
www.educationcounts.govt.nz/publications.
Summary

The context for this inquiry centred on possibilities for setting up an urban farm on the school grounds. Students from the school, and from several contributing primary schools, were supported to undertake a structured inquiry cycle to determine the most appropriate use for this land. Different groups investigated different possible uses.

Inquiry Team

- Project leader: Simon McMillan.
- The other members of the project team were: Judith Shields, Peter Dodds, Ruth Eley and Karen Flett (Kaikorai Valley College). Amy McBeath (Kaikorai Primary) Shane Parker (Balaclava Primary) Wendy Ross (Concord Primary) Emma Murdoch (Mornington Primary).
- External advisors: Rose Hipkins NZCER supported the team by developing critical thinking strategies to best fit with the processes of learning during student inquiry; and ways of assessing shifts in students’ thinking and overall learning development.
- Trevor McDonald from the Ministry of Education provided initial advice and support during the project application and set up.

Background

- A perceived lack of full engagement in learning by students, especially priority learners, based on achievement data at some junior and senior levels of the College
- The opportunity to support the learning of Science in primary schools
- Changing the learning in Science to facilitate better engagement and achievement by using more applied contexts, and more inquiry driven and student centred practice
- A recognised need to develop the key competency of thinking for a future focussed world, by explicitly teaching it through inquiry
- A desire for collaboration and full sharing of teaching practice by developing an equal status team approach.
The inquiry

The project was led by a Teacher Project Group (TPG) that identified, designed and tested the criteria that would allow critical thinking to be taught, monitored and evaluated. It was envisioned that teachers would participate in a collaborative network across the secondary school and four primary schools. The teacher led group worked collaboratively to implement the project through a series of regular meetings for PLD, planning events and site visits. Students communicated their plans for inquiry across schools at a designated event and through an online collaborative by Teachers and students who selected an action question provided by the TPG. Students investigated microclimate, hydrology and physiography of the site, using hand held devices to collect data. Students then analysed their data and reported on implications for their proposed course of action (e.g. whether and where to plant fruit trees on the farm; whether and how to keep bees etc.). The urban farm experiences were then extended to other contexts and ideas in special school visits and a field day. Students presented their inquiries and discussed them with teachers and peers.

Student concept maps, consequence wheels, a ‘Thinking with Evidence’ assessment, and reflective logs were used to ascertain students’ ability to think critically and recognise evidence of critical thinking in others. Engagement measures were also undertaken. Monitoring of teacher development was completed through self-reflective professional blogs, group discussions during PLD, and feedback questionnaires.

Key findings

- The data suggested that teachers and the majority of students improved their ability to think critically and to recognise it in others.
- Teachers reported greater confidence in developing critical thinking skills and using innovative tools to develop students’ critical thinking abilities.
- There were some impacts on student engagement for some priority learners.
- There was increased collaboration within and across participating schools.
- The team identified a need to develop explicit classroom pedagogies that build metacognition.

Key implications (in terms of the goals of TLIF)

- TLIF projects are more likely to be successful when all participants have an
opportunity to develop project plans and goals collaboratively. This ensures that participants are clear about their roles and the commitment that the project will entail.

- Sufficient time to manage large projects needs to be factored into the project budget.
- M?ori expertise is critical in community projects.
- Teachers in the project team should be full participants; that is exploring their own practice, rather than directing other teachers' inquiries.

**Plans for sharing the findings**

- Copies of the report and feedback to all of the partnership schools.
- A short article of findings and protocols for use are available on request
- Presentation at Eagle Technology on innovative use of GIS technology for decision making.
- Further developments can be found at [https://www.facebook.com/urbanconceptfarmKVC/](https://www.facebook.com/urbanconceptfarmKVC/) (Accessed: 02 July 2018)
Reference List


For further information

If you would like to learn more about this project please contact the project leader Simon McMillan at simcmillan@kvc.school.nz
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