

CAPSULE

Page Index

[Description](#)
[Participants](#)
[Findings](#)
[Outcomes](#)
[Impact](#)
[Related Documents](#)

Quick Links

[Download Infosheet](#)
[Download Report](#)
[Visit Website](#)

CAPSULE: Contexts
that Apply and
Promote Scientific
Understanding
Learning and
Expression

Project Team	Dr Greg McPhan, Dr Terry Lyons (SiMERR NSW)
Period	October 07 – December 08
Funding Agency	SiMERR
Organisational Base	SiMERR NSW

Description

[↑ Top](#)

Embedded in the rationale for the NSW junior science syllabus is the idea that engaging learning experiences for students should build on their prior knowledge and be set in meaningful and relevant contexts. Knowing how teachers identify and develop existing knowledge provides important information about how to engage students in learning science, particularly in the early secondary years as this is a time when students are beginning to make major decisions about their future patterns of study.

This project is structured to focus on the planning aspects of teacher practice and how it links with providing meaningful learning experiences for students. Five rural schools are involved in the project with two teachers participating from each school in the preparation and trialling of units of work during several one- and two-day workshops. The two units of work selected for the project are based on concepts associated with forces and living things.

During the project teachers will be:

- Using a definition of scientific literacy as an advanced organiser for sequencing the units of work. This definition comprises eight elements that encapsulate essential skills for the 'scientifically literate citizen';
- Using a specific instructional model to develop learning activities for the units; and
- Reviewing their current assessment practices from an 'assessment for learning' perspective.

Data in the form of interviews with teachers and unit evaluations by students will be used for project evaluation. This material will provide an additional perspective to interview data about learning in contexts gathered from teachers in metropolitan and regional schools in 2004 (Lyons, 2004).

Participants

[↑ Top](#)

Ten teachers (early-career and mid-career); students in Year 8 from the five schools.

Findings

[↑ Top](#)

This is a continuing project and the trialling of units along with the collection of student survey data is ongoing.

Interview data from teachers is based on the following areas:

- Syllabus guidelines for teaching context-based science;
- Resource availability;
- Impact of a context-based approach on student learning;
- Opportunities for professional development;
- Pedagogy associated with a context-based approach;
- The scope of applying a context-based approach to teaching and learning.

A number of preliminary results have emerged from an analysis of teacher interview data. Important areas for teachers related to the direction for meaningful learning provided by the syllabus, the resources available, and the nature of student learning. Concerning the syllabus, teachers felt that it does not actually specify an approach for context-based teaching and that interpreting the syllabus can lead to two possible options: one is to use a context in a multi-disciplinary way, introducing concepts from the different branches of science, and the other is to ensure that concepts associated with one discipline are introduced in a way that embeds them in a specific context. The teachers' view is that the former has a tendency to confuse students and the latter is more likely to make science seem relevant for students.

An additional syllabus issue for teachers related to student performance. When preparing students for state-wide testing, the comment was made that there is a degree of uncertainty about predicting what might be required, as much of what was intended (in the syllabus) doesn't come through. Teachers commented that it was only after a number of years of interpreting state-wide tests that they thought they could confidently "read" the examiners intent.

When it comes to providing appropriate resources, teachers' comments indicated that, whilst there are many resources available, materials that support context-based learning are most effectively prepared at the school level. Teachers acknowledged that part of their practice is to regularly review and improve units of work. For them, this means that available texts need to be supplemented with a range of tailored resources or those which highlight the science associated with current events. Two issues that impact on student learning were identified by teachers as the competition from other subjects and the student view that doing at least one science in the senior years was going to be good for them after leaving school. According to teachers' comments, high levels of interest in science and good results might be achieved in the early secondary years, but from Year 9 onwards, a range of other competing issues become important. These include the appeal of other subjects, the need to consider the best UAI possible, and the constraints of curriculum planning at the school level.

Outcomes

[↑ Top](#)

- Resource materials for each of the units.
- A presentation at the STANSW 2008 conference is planned.

Impact

[↑ Top](#)

Teachers' involvement in the process of developing meaningful learning contexts, together with interview and survey data has the potential to provide important commentary concerning:

- Effective components of collaborative professional development identified by rural teachers;
- Students' views about aspects of a context-based approach which supports enhanced engagement in their learning about science; and
- A broader understanding of the issues which impact on engaging students in science during the secondary years of schooling.

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