



**NZASE
research
resource**

Creative assessment for NCEA science



Dunedin Physics teacher Mary Rabbidge is exploring cross-curricular assessment. For her Masters in Science Communication, she studied the interest and barriers to using storytelling in this kind of assessment. She also created a how-to website for teachers. She spoke with NZASE Science Communicator Jenny Rankine.

Background

As well as a long-standing interest in languages and stories, Mary was motivated to try storytelling in assessing her students' Science understanding because of common assessment problems. Some students understood the content but couldn't succeed in assessment, because they struggled to write reports, and did not find the topics engaging.

She was also tired of "the same copy-paste-tweak report" regularly appearing in her pile of marking. The research she read also showed that when students learn and communicate through stories, those who don't identify with the classroom's dominant culture were able to connect with science topics and the teacher.

Mary surveyed 111 Science teachers recruited from the NZASE newsletter and teacher Facebook groups, and interviewed 13 in more depth. She found that these teachers were generally interested in using creative assessment methods for NCEA science courses but did not have the confidence to do so.

Teachers who had used cross-curricular assessment before were more confident and more likely to use it again than those with no experience, and those who had taught for more than 20 years were less willing to try.

Barriers

Mary describes subject integration as a

delicate ideal that is difficult to achieve in secondary schools.

One of the barriers that teachers perceived was the challenge of aligning NCEA standards for different subjects. One teacher pointed to the difficulty of aligning other learning areas with the narrow concepts of physics and science standards. The difficulty of collaborating with teachers of other subjects was another barrier, including finding teachers willing to work together and finding regular times for planning meetings.

Teachers were also concerned that cross-curricular assessment would take more time than existing methods, and increase the workload of teachers and students. However, teachers with previous experience of cross-curricular assessment were more positive about these barriers.

Experiences with students

During her research, Mary used a Level 3 assessment for AS91522 where students created a podcast that applied physics to an aspect of music they chose. Some looked at harmonics, others at how an instrument produced sound, or how a speaker worked. "It clicked with them more - I've never seen students so engaged in an assessment project, and the results were outstanding - 54 percent gained an Excellence grade."

She also "found it much easier to mark a creative project than a written report, and much easier to see what they understand". Also, "students who were too shy to talk in class expressed themselves much better - there was less fear. Students can choose a way that works for them to express their understanding."

She also did an assessment with a Y11 class for AS90955, where students used

Mary Rabbidge, with templates from her [Labora-stories](#) website about creative, cross-curricular Science assessment.



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A board game showing Y11 Science student understanding of a viral infection.

different forms of storytelling to show their understanding of the extinction of the dinosaurs. Students could create a video, board game, written report or slide show.

Using new technology for an assessment takes careful planning – “they had to work out how to make a big rock land on their dinosaurs and get a shot of it”. Mary’s school offers basic video techniques at junior level, “but a lot of them are making videos for YouTube or tiktok anyway”.

Students from a Year 9 class who used storyboarding to communicate science understanding asked to do it again. “The sense of being able to achieve was really good for the boys who struggle with writing.” Other Science teachers at Mary’s school used podcasting and board games with their students.

One board game (above) showed the story of someone getting sick with a virus. A chance card read: ‘You eat Vitamin C tablets (doesn’t help once you get a cold); move back 1 square’. “One student handed in a stop-motion animation for a real-world application of chemistry.”

For these type of assessments teachers need to build in time for students to develop the skills required. Mary spent a lesson working on good versus bad stories and good versus bad podcasts, and what elements are needed for a good story or podcast. She then provided suggestions of software or templates for the different facets of each skill, and students practiced developing their chosen format.

Doing this in groups with junior classes could give teachers and students time to develop the skills while increasing engagement in science. Teachers do not need to be expert in making podcasts and videos, but they do need to be able to help students find answers when they get stuck.

NCEA changes

While the NZ Curriculum (NZC) holds that learning should not be confined by subject boundaries, the current NCEA promotes a fragmentation of knowledge, reflected in teacher comments in Mary’s research.

However, Mary says that proposed new Science standards align far better with the NZC, encouraging integration of skills across the curriculum, and creative assessment. Mary believes that Science students will be able to present work and provide evidence through diagrams, timelines, cartoons, and other methods that reflect their interests, if their teachers are willing to allow them.

Laborastories website

[Mary’s Laborastories site](#) provides steps to help teachers develop creative methods for NCEA Science assessment, two exemplar units, some of the research behind cross-curricular assessment, as well as good literacy activities.

Links

NZQA has collected video evidence from schools about innovative assessment; [see the introduction](#) and the [case study videos](#).

References

- Science Video Project: Martin, K.M., Davis, L.S., & Sandretto, S. (2019). [Students as storytellers: Mobile-filmmaking to improve student engagement in school science](#). *Journal of Science Communication*, 18(5), 1–19.
- Tolbert, S. (2015). [“Because they want to teach you about their culture”](#): Analyzing effective mentoring conversations between culturally responsible mentors and secondary science teachers of Indigenous students in mainstream schools, 52(10), 1325–1361.
- Gilbert, J., Hipkins, R., & Cooper, G. (2005). [Faction or fiction: Using narrative pedagogy in school science education](#). In *Redesigning Pedagogy: Research, Policy, Practice* (pp. 1–16).

Ngā Kupu

- [Aromatawai](#) – Assessment
- [Ataata](#) – Video
- [Kōrero paki](#) – Storytelling
- [Pakihere rokiroki](#) – To podcast
- [Tātauira](#) – Template
- [Tītohunga ata](#) – Slide show
- [Tuhinga auaha](#) – Creative writing.

From Paekupu and Te Aka Maori Dictionary



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