



VUW Teachers
Symposium 2019
Assessment of
Inquiry-Based
Learning in
Mathematics and
Statistics

Neil Marshall
National Assessment Leader
Mathematics & Statistics

Angela Jones
Team Leader & Online Learning Manager
Assessment and Moderation, NZQA

The scepticism threshold: Is there any evidence for inquiry learning?

Tom Bennett – ResearchED

“Take inquiry learning – super fashionable internationally. There is a lot of really weak evidence to suggest that children should be off learning by themselves, and that they have got to co-construct their own learning.”

Cathy Wylie – NZCER

“Inquiry learning and co-construction aren’t about letting kids do whatever they want, which is a simplistic and obtuse misuse of the concepts. Fundamentally the goal is to drive engagement – to help kids to find out what they are interested in learning about.”

“There’s some very good research that has found that if you increase student agency in that sense, then they will be engaged, and they will learn more. I think Tom is being rather black and white about it. It’s about the teacher and learner both being part of the discussion as to a student’s learning needs.”

<https://educationcentral.co.nz/the-skepticism-threshold-is-there-any-evidence-for-inquiry-learning/>

Learn to love learning

Kathryn Ryan - RNZ

“Can the three Cs of Critical Thinking, Creativity and Collaboration be taught?”

“We see it (stress) even with the brightest kids, when they go into exams and blank out....But I wonder if that is almost a permanent state for the child who struggles or who has a poor concept as a learner or an unrecognised impediment to their learning.”

Jared Cooney Horvath – currently University of Melbourne

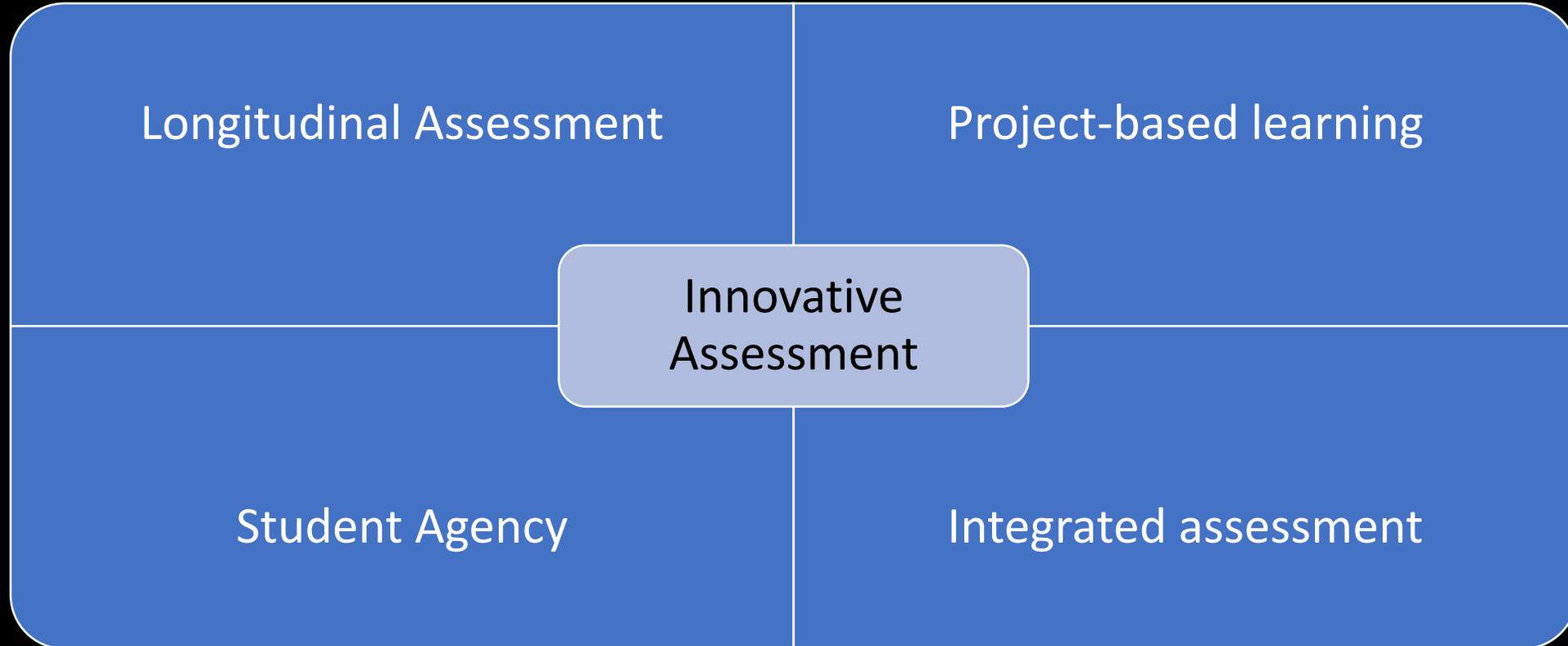
“You have got two aspects...there is the stress angle...once the stress get prolonged or really super high there is no learning going on. Just pause, let it go. 30 seconds to kill a stress response. The deeper problem is the kids who...it’s a full-on story. Top down processing: you use your experiences...to push back, to change what you perceive. So the kid because I am “XXXXXX” I will never learn...it just won’t work. So we must change the story to “ I can engage with this, I can learn.”

<https://www.rnz.co.nz/national/programmes/ninetoon/audio/2018717603/learning-to-love-learning>

What is NZQA seeing through the moderation process?

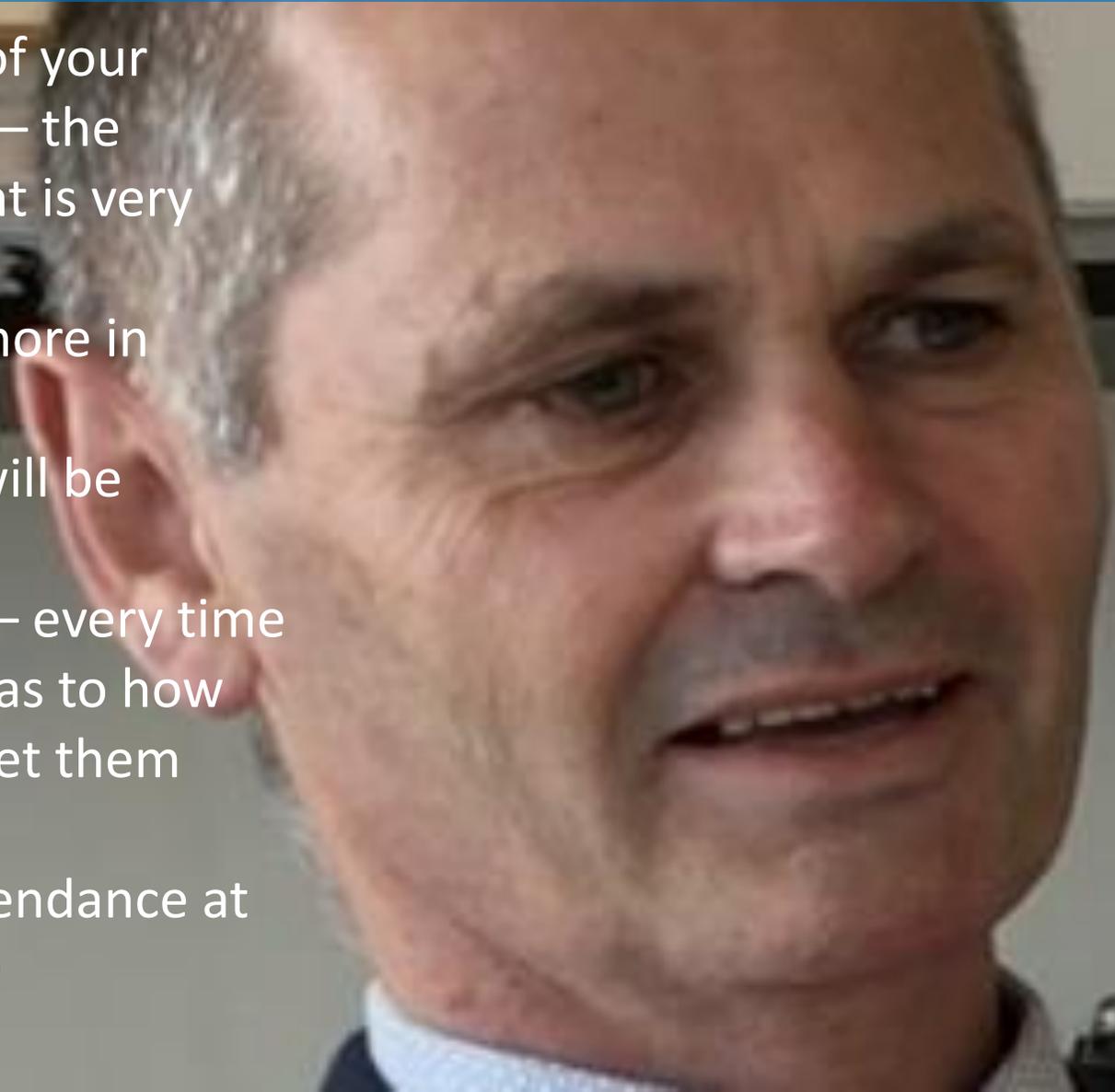
- Through the moderation process NZQA are able to see the assessment activities that teachers are using with students to provide evidence for the standard (internal).
- We see these in many schools, in all subjects, and these activities are a reflection of innovative teaching and learning.
- The teaching, learning and assessments are varied, some can clearly be labelled as "inquiry learning."
- All are designed to enhance student engagement, which in turn enables better student outcomes.

Innovative Assessment – what have we found?



What did the leaders tell us?

- Win hearts and minds of your school community first – the learning and assessment is very different
- Be prepared to invest more in staffing
- Appreciate that there will be teething problems
- Acknowledge the wins – every time
- Check in with students as to how they are finding it and let them suggest improvements
- Track any increased attendance at school, improvement in achievement



What did the teachers tell us?

- Collaborate with other teachers and departments
- Review, review, review – what is working, what isn't
- Allow student some agency over mode of assessment and/or context
- Planning is key to ensuring better outcomes
- Celebrate the successes



What did the students tell us?

- We need more time to demonstrate what we know
- We do better when we have some choice over context
- We like solving real-life problems that we are interested in
- We want to be assessed when we are ready



Some of the stories

What are the moderation team seeing in Mathematics & Statistics?

- ❖ Assessment activities that are not timebound and are open book.
- ❖ Assessment activities that allow students to select the context within which it is framed, particularly for statistics.

Some examples:

- A generic assessment activity for AS 91582 (Use statistical methods to make an inference.) This allows students to select their own context, research their own context and source their own data.
- An open context for AS 91583 (Conduct an experiment to investigate a situation using experimental design principles). The "openness" allows students to research the context and select the intervention they wish to investigate.
- An overarching context for AS 91582 and AS 91581 (Investigate bivariate measurement data) which gives the students the freedom to design their own pathway through the investigation.

Cross – curricular assessments

- AS 91036 (Investigate bivariate numerical data using the statistical enquiry cycle) and 90935 (Carry out a practical physics investigation that leads to a linear mathematical relationship, with direction.)
- AS 91168 (Carry out a practical physics investigation that leads to a non-linear mathematical relationship) and AS 91257 (Apply graphical methods in solving problems.)
- Field week activities. An increasing number of assessments entwine statistics with data collected from science and social studies field trips.
- One school utilised a week in Waitomo exploring the caves to create evidence for Level 1 Number, Measurement & trigonometry with other subjects.

Perhaps this sort of thing is not quite "teaching as enquiry" but there are common themes, the major one of which is "engaging contexts."

Upcoming from NZQA

Case studies

- What will the examples include? A selection of:
 - Administration, teacher, student voice
 - Some task or assessment framework examples
 - Student work
 - Some data



Transforming Assessment Praxis (TAP)

Aims of programme:

- To learn how to change an assessment resource or task to better meet needs of students; and
- To explore different ways of collecting assessment evidence.

Questions

WHO
WHEN
WHERE
HOW
WHAT
WHY