Embedded Literacy and Numeracy Project
Action enquiry - Case study from Otago Polytechnic

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Otago Polytechnic recognises that strong literacy and numeracy skills contribute to the success and retention of our students, and the ability of our graduates to lead fulfilling lives and to contribute in the workplace and wider society. The Otago Polytechnic developed and implemented its own initial literacy and numeracy evaluations in 2008 and has used these across programmes to identify students who would benefit from literacy and numeracy support. A literacy strategy for 2008-2012 was developed and approved in April 2008.

Tertiary Education Commission-funded literacy and numeracy professional development clusters took place at Otago Polytechnic in 2008 (literacy) and 2009 (numeracy), and these were followed up with in-house professional development led by the Embedding Literacy and Numeracy team.

The action enquiry project presented here was an extension of embedding work that was already underway at Otago Polytechnic.

ACTION ENQUIRY TOPIC & RESEARCH QUESTIONS

The aim of the action enquiry was for lecturers from the Basic Mechanical Engineering Trades Skills (BMETS) programme to explore what strategies they used to help students manage the reading demands of course material, and to evaluate how effective these were.

- What strategies do lecturers use to help students read effectively?
- To what extent do these strategies help the learners understand the material?

CONTEXT

The BMETS programme is a Level 2, open entry, one semester-long programme. The programme is delivered on campus, with students attending four days per week from 8am - 4pm and, depending on individual needs, either one day of work experience with a local engineering employer or a small group two-hour tutorial with Learning Centre staff.

There is a mixture of classroom-based theory and practical sessions in the workshop. There is a lot of written theory material and

assessments based on material produced by COMPETENZ, the Industry Training Organisation, that students must work through in a short period. These have been mapped at Step 5-6 of the Learning Progressions. Successful completion of the five-month long programme counts for the first year of an apprenticeship in mechanical engineering.

THE STUDENTS

The programme mainly attracts young men, who come with a range of literacy and numeracy skills, from Steps 2-6 of the Learning Progressions. There are usually 12 -16 students on the programme; during this research project, however, there were 10 students.

THE LECTURERS

Of the four BMETS lecturers teaching on the programme only one lecturer was significantly involved in the action enquiry. There was no opportunity when all lecturers were free at the same time to attend meetings about the programme, or to discuss the research project. Two lecturers worked with students in practical sessions in the workshop. The lecturer who was involved in the action enquiry was new to teaching – he began teaching in mid-2009, and had just begun the Otago Polytechnic teaching qualification, which is offered part-time to fit around teaching commitments. The other lecturer felt too busy with other workload to participate in the project; however, he had been involved in embedding literacy and numeracy work previously and did participate in the initial brainstorm.

The other members of the action enquiry team were a member of the Embedding Literacy and Numeracy team and a staff member from Otago Polytechnic's Educational Development Centre (EDC) who was the only member of the team with previous experience in formal research. She helped with providing advice on applying for ethics approval, developing the survey and analysing the results.

METHOD

The main methods were two student surveys, the use of a range of teaching strategies, a new pre-reading learning activity, and comparison of student assessments.

Designing the survey: during a focused interview with the Embedding Literacy and Numeracy team member, two of the BMETs lecturers brainstormed the strategies they currently used to help students manage the reading demands on the programme. This brainstorm was used to develop a written survey. The purpose of this written survey was to collect information from students about what reading strategies they had used to help them manage the reading material and what the lecturer had done that helped them. The survey used a Likert scale and there was space for students' comments.

The EDC staff member helped to develop the survey, providing advice on how to word questions, use a Likert scale, and quantify response options, e.g., suggesting a percentage was given to help define what "a little" or "a lot" meant, to improve the reliability of how students interpreted these questions.

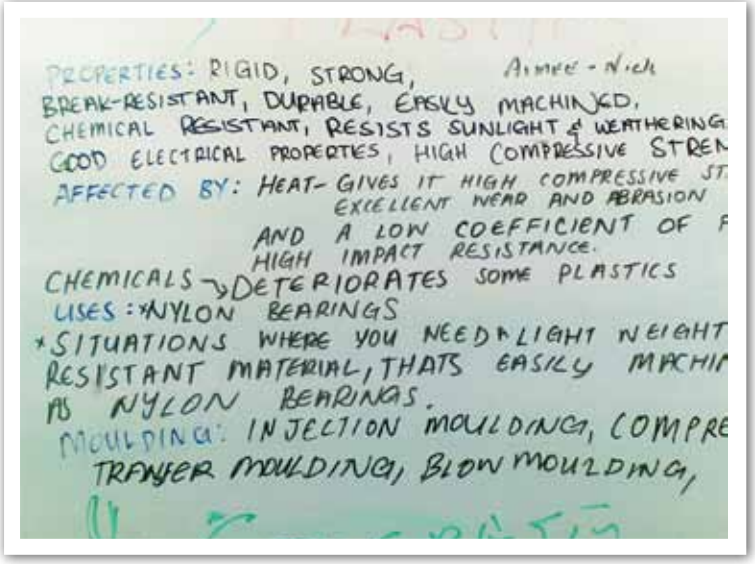
In week 2 of the programme, the action enquiry team debriefed a contextualized reading assessment students had done. They then used this as a springboard for talking about the reading demands of the programme, how to introduce the research project and seek students' consent to participate in the research project. All students agreed to be part of the research project.

At the end of Week 4, after completing the first theory unit (Health and Safety), students were asked to complete the first written survey, towards the end of class time. These results were subsequently tabulated and analysed.

The intention of the action enquiry had been that the lecturer would adjust his teaching strategies in response to this initial survey feedback, as part of the action enquiry cycle. However, the results showed no clear gaps in the reading strategies the students used, or preferences in terms of teaching strategies.

The team therefore decided that the lecturer should continue to use a range of teaching strategies to help learners manage the course material. However, the lecturer would also trial and seek feedback on a new pre-reading activity, in which students worked in pairs to research a topic on the computer and report back to the class. This learning activity would be used when students were studying the unit 'Engineering Materials'. Previous cohorts had found this unit difficult and laborious.

This lesson occurred four months into the programme, during an 8am–10am time slot on a Monday morning. The Embedding Literacy and Numeracy team member observed this class. The lecturer began by brainstorming what non-metal materials were used in engineering. He wrote students' suggestions on the board, then categorised these. The lecturer then assigned students to investigate these topics in pairs or threes, using the computers in the room. Students were given a handout with prompts to guide them as they did the research, and were told to take notes, which they would then be expected to write on the whiteboard for the class.



A week later, after completing a written assessment on engineering materials and metals, students were resurveyed about the reading strategies they had used and how helpful they had found particular strategies the lecturer had used to teach the unit. An additional question was added to this survey asking students for feedback on the computer research activity.

The results were then tabulated and analysed.

FINDINGS

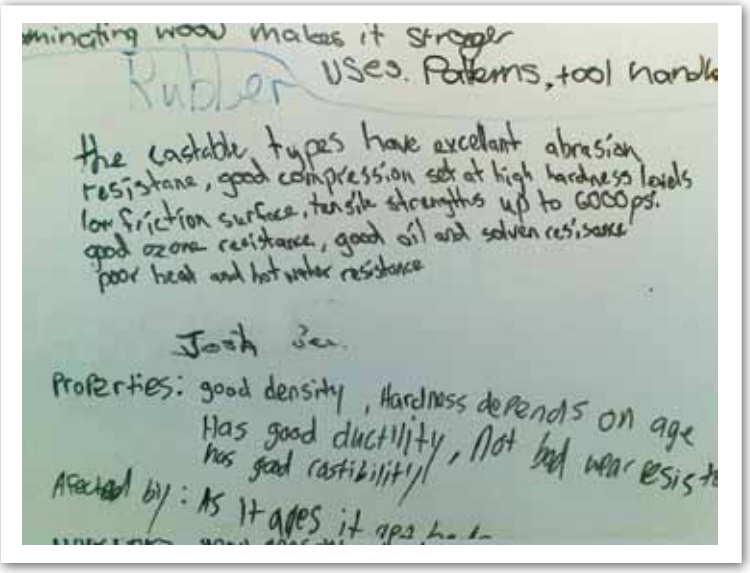
The initial survey results indicated that students felt they used a number of reading strategies to help them understand the material. Almost all students reported high use of the reading strategies, e.g., thinking about what they already knew about a topic before reading, looking for key words, skimming rather than reading all of the text closely.

In terms of other teaching strategies the lecturer used to support the students' understanding of the material, the responses showed students thought a range of activities supported their learning.

The comments sections in the survey allowed the researchers to collect additional information. The researchers noted that asking questions about reading strategies prompted some students to reflect on what they do – and what they could do differently. For example, in answer to a question which asked whether the student had identified key words in the question and looked for these in the Health and Safety material, one student responded "No, but I should have."

The action enquiry process allowed the researchers to adapt their initial research focus, when the initial survey results did not show any particular gaps in the strategies the learners reported using, or preferences in teaching strategies.

The group research activity that was trialled at the end of the first cycle of the action enquiry appeared to really engage students – the action enquiry team members observed lots of student talk about the topic, and about how useful a website was for their purpose. The guided sheet appeared to help students keep on track and produce useful notes. As students presented back to the group, they were able to answer other questions that the lecturer asked to probe their understanding of what they had written, for example the meaning of technical terms.



When students were resurveyed about the reading strategies they had used their responses were similar to the first survey. Again students felt they used a range of reading strategies, and that all the teaching strategies the lecturer used to help students understand the topic were helpful to at least some students. 9/10 students responded positively to the additional question in the survey, asking for feedback on the computer research activity. Comments included: "more info", "took notes that helped", "it was visual", "it was different."

On marking the students' assessments on engineering materials, the lecturer found results on this unit were better than previous cohorts'.

WHAT WE LEARNED

While there is naturally variation in cohorts that could lead to different results, the action enquiry suggested that using a range of teaching strategies to help learners manage the reading material was a prudent approach. Using learning activities in which students are able to be very active, such as the group research task, providing a written sheet to guide students as they sought information and a framework for reporting back, all helped students take useful notes and improved the quality of reporting. This resulted in great student engagement during a challenging learning time, 8am-10am on a Monday morning, and possibly better student assessment results.

The focused interview with lecturers, prior to planning the survey, to identify what strategies lecturers already used to help students manage the reading material, was enjoyable and encouraging.

Explaining the research project to the BMETS learners made explicit the lecturer's interest in helping learners deal with one of the most challenging aspects of the programme – managing the volume of reading material. This was a very important message to give students. It also made explicit the lecturer's interest in using student feedback to inform his teaching to help students learn.

Talking with students about reading strategies and surveying students also seemed to encourage some students to be more reflective about their learning.

Working in a cross-departmental team, and with support from experienced researchers from both within and outside of the organization, was both helpful and affirming.

CONCLUSIONS

Action enquiry was a useful process and provided a framework for the practitioner-researchers to identify and evaluate a particular intervention. It helped maintain interest in the embedding literacy and numeracy work.

The opportunity to work with experienced researchers to refine a research question so that it was manageable and to learn how

to use particular methods of data collection was also helpful.

Working through the ethics approval process was challenging. The process seemed drawn out for such small projects and didn't fit with the tight time frame we were working to. It would have been helpful to have a face-to-face conversation with a research mentor before submitting the proposal.

WHAT NOW?

The research participants all enjoyed being involved in the action enquiry and working in a cross-departmental team. Having an opportunity to share research results was important and more needs to be done to create these opportunities.

The BMETS lecturer was already proactively looking for ways to help students learn better, as a very reflective practitioner. However, his observation that being involved in the Embedding Literacy and Numeracy project and the action enquiry has altered his teaching approach and understanding of how students learn, indicates that the whole process was very worthwhile. He asked to be involved in another action enquiry this year on another aspect of embedding, and was able to do so.

Acknowledgement: This action enquiry study was undertaken as part of a project commissioned by the Department of Labour.