

RESEARCH ARTICLE

1+1 is greater than 1: Developing Scholarship with Students as Partners

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Abstract

This article is based on a keynote presentation delivered by the corresponding author at CETL-MSOR in September 2025 at the University of Liverpool. The article is co-authored with two student partners. It explores the pedagogy of students as partners and how this can be used to develop scholarship of teaching and learning in mathematics. Examples are provided of projects involving the authors on assessment and feedback literacy and the development of scholarly informed activities for abstract algebra teaching.

Keywords: Scholarship, students as partners, feedback.

1. Background

The ‘student voice’ has become an important part of quality assurance in higher education. The National Student Survey introduced a new set of questions under Student Voice in 2017; the Teaching Excellence Framework included an independent student submission in 2023 and the UK Quality Code for Higher Education includes ‘Engaging with students as partners’ as one of its core principles (QAA 2024).

There are several ways that the student voice can be recognised and utilised, for example student surveys and via student representatives (Peart, Rumbold and Fukar 2023). Student surveys offer an opportunity to capture feedback from all students but, in practice, response rates can be low due to survey fatigue and other factors (Adams and Umbach 2012). It is important to close the feedback loop by ensuring that students see how their feedback has been acted on. However, a ‘you said, we did’ approach can appear transactional, reinforcing the idea that students are ‘consumers’ of their education.

Student representatives are widely used in higher education but due to competing demands on their time, they may not always be able to fully represent their cohort and provide timely feedback to their peers. If student representatives are expected to do this as an unpaid voluntary role, this may exclude this opportunity for students who need to undertake paid work alongside their academic studies.

2. Students as Partners

Students as Partners (SaP) is a pedagogical approach where students and academic or support staff work collaboratively to improve teaching, learning and the student experience (Healey, Flint and Harrington 2014). There is an ongoing dialogue between staff and student partners and an emphasis on learning from each other so that all parties benefit from the experience. SaP projects will often take place over a several weeks or months and the student partner may receive payment for the

work which means they are viewed more as a colleague, breaking down the academic-student hierarchy. Student partnerships may focus on co-creating teaching and learning resources, co-developing the curriculum and university policies or co-researching in the scholarship of teaching and learning (Peart, Rumbold and Fukar 2023).

At the University of Manchester the corresponding author has been involved in a variety of SaP projects over several years. In particular, the development of Peer Assisted Study Sessions in the mathematics department since the early 2000s (see the case study in Robinson et al. 2010). In this article we describe recent projects on feedback literacy and scholarly informed activities for abstract algebra teaching.

3. Feedback Literacy and Active Self-Feedback

Developing students' feedback literacy has been shown to support students' learning and enhance their ability to self-regulate their learning (Carless and Boud 2018). In June and July 2023, the corresponding author worked with colleagues in the mathematics department (Nikesh Solanki, Cesare Ardito and Rose Wagstaffe) and a student partner, Sophie Marshall, on a project looking at assessment and feedback literacy. The student partner was employed as a Student Experience Intern, funded by the University of Manchester. She had recently completed the first two years of an undergraduate programme in Mathematics and Philosophy.

3.1 Survey

The project team developed a survey that was sent to all progressing undergraduate Mathematics students. There were 75 students who completed the survey, a small proportion of the cohort, but this was not surprising given that it was distributed outside termtime. The survey was anonymous but students were asked to report their year of study and their predicted degree class. The survey asked a range of questions about how students used different forms of feedback.

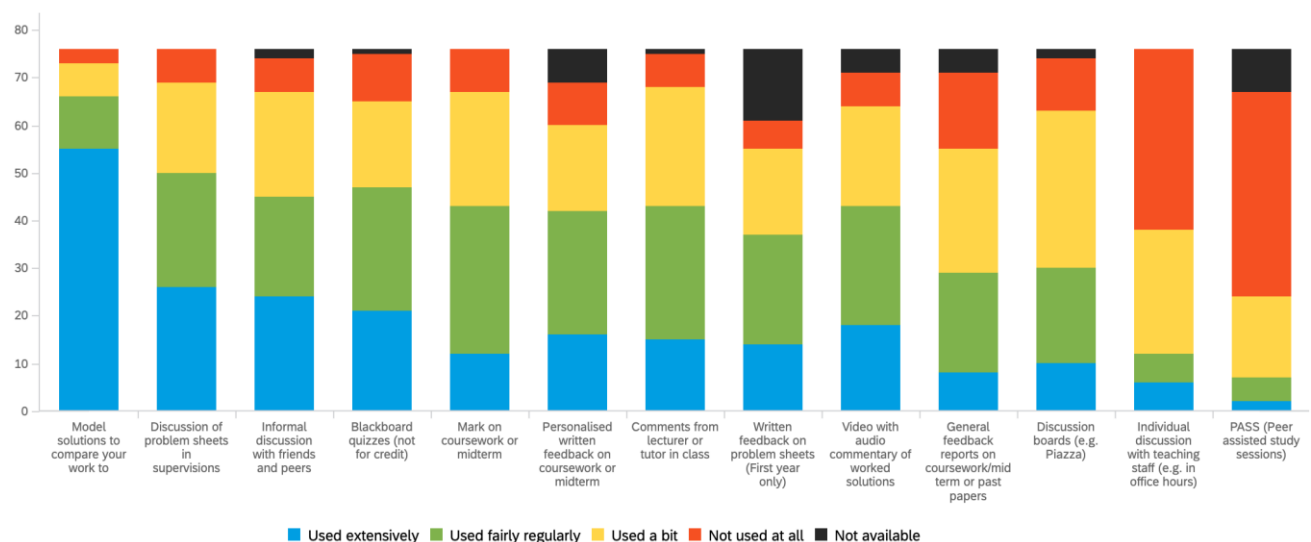


Figure 1. Summary of survey responses to the question: For each of the following sources of feedback, how much do you use them?

In one question, they were given a list of methods of feedback and asked how much they used them. The responses are given in figure 1. It was interesting to see that model solutions were used far

more than other forms of feedback, suggesting that students were routinely making judgements about the quality of their own work by comparing it to solutions produced by their lecturers.

A later question asked students how often they felt confident judging the quality of their work without help from staff or peers. The results were broken down by current degree class grade (this information was self-reported by the students), see figure 2. These results suggest that students with higher grades may feel more confident self-assessing their academic work.

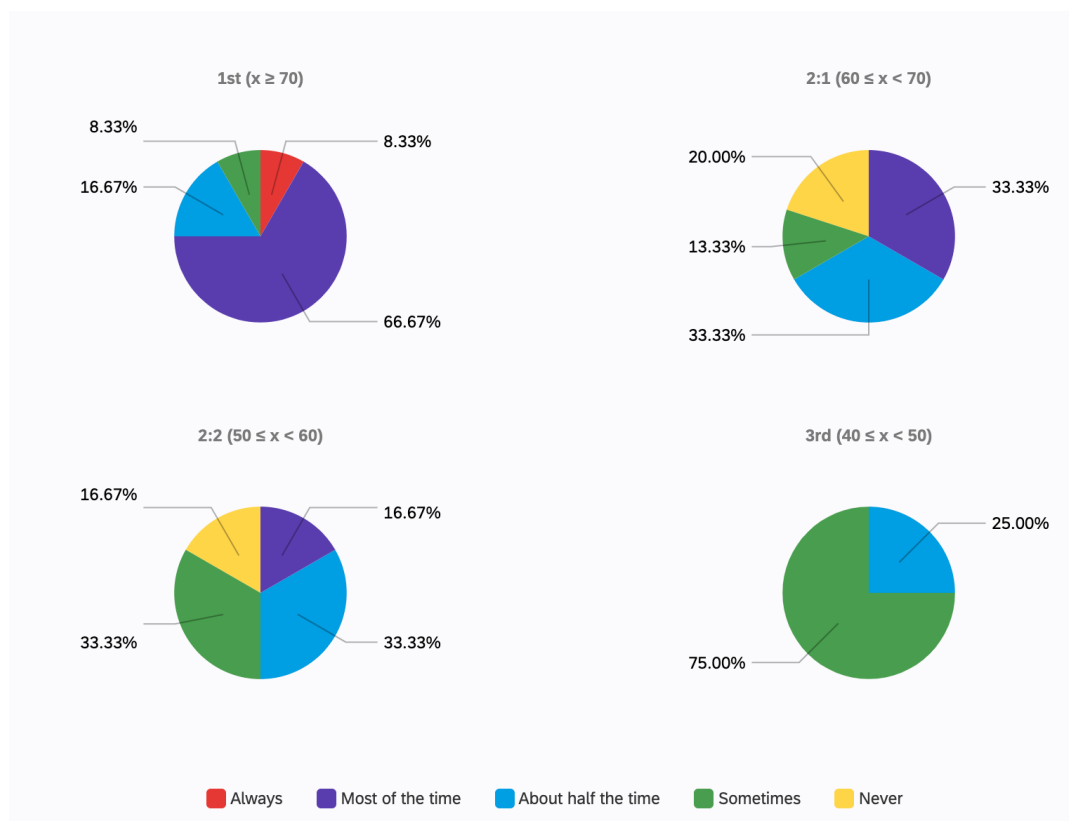


Figure 2. Summary of survey responses to the question: How often do you feel confident judging the quality of your work without help from staff or peers?

3.2 How to Study Maths Course

Using the survey results and the research literature, the student partner wrote a student guide on effective use of feedback and worked with the academics to prepare materials for a new study skills course called How to Study Maths. This course focuses on assessment and feedback literacy and addresses the ‘hidden curriculum’ in mathematics teaching (Orón Semper and Blasco, 2018). The hidden curriculum has been defined as “*what is implicit and embedded in educational experiences in contrast with the formal statements about curricula and the surface features of educational interaction*” (Sambell and McDowell 1998: pp391–392). The How to Study Maths course includes sessions on assessment and feedback literacy. In the assessment session, students see how exam questions are constructively aligned to the course units’ intended learning outcomes and in the feedback session we explain the purpose of feedback and how students can use it effectively. The students are told that the sessions were co-created with a student partner to make them more relevant and encourage students to take ownership of their learning. This course has been delivered as six sessions across semester 1 for approximately 280 first year single honours mathematics students since September 2023.

3.3 Active Self-feedback

During the feedback literacy project, our student partner became particularly interested in a technique called 'active self-feedback'. This feedback literacy method was developed by a colleague, Jennifer Rose, from the Alliance Manchester Business School (Nicol and Rose 2025). Active self-feedback is based on the theory of inner feedback, introduced by David Nicol (Nicol 2021). The idea is to make use of students' natural ability to make comparative judgements by comparing their work with an exemplar such as a model answer, peer work, a mark scheme or an AI generated answer. These comparisons are then made explicit by the students using a short list of questions to which they record their answers.

This initial feedback literacy work led to a collaboration between the lead author, Jennifer Rose and Jen McBride (an academic in Psychology) in which we ran a cross-Faculty project demonstrating how active self-feedback could be used in a range of disciplines to support activities such as essay/report preparation, engineering design, note taking and mathematical proof writing. We were able to employ the same student partner, Sophie Marshall, to work with us for 12 months. The student partner took part in some of the activities, developed case studies with the academics and co-produced a staff and student training resource (Rose et al. 2025). This resource includes 18 case studies, including the use of active self-feedback to support the How to Study Maths assignments. These assignments linked to the live sessions and used the online tool peerScholar (peerScholar 2024) to facilitate peer feedback and active self-feedback. Students first submitted their own work and then they were able to compare their work with the anonymous submissions of two other students. The students then provided peer feedback and self-feedback by answering a short set of questions. At the end of the course in December 2025, students were asked to complete a survey and reflect on what they had learned from the active self-feedback process. Of the 285 students on the course, 169 completed the survey. Common themes that appeared in this reflection were

- there is more than one way to solve a maths problem.
- the importance of using words to explain the steps in a proof
- explanations should be clear and well-organised
- using precise language makes answers more concise but still correct
- the ability to judge how they are progressing academically compared to their peers.

4. Scholarly informed activities for abstract algebra teaching

During the summer of 2025, the corresponding author worked with a student partner, Sarah-Sonia (Sonia) Balan on a London Mathematical Society funded Undergraduate Research Bursary project. Sonia had recently completed the second year of the MMath Mathematics programme at the University of Manchester. She was particularly interested in exploring the pedagogical theories that could support teaching abstract algebra and we saw this as an opportunity to work together to develop scholarly informed teaching and learning activities.

Sonia interviewed six lecturers in the department who currently teach on abstract algebra course units. In these interviews she explored the challenges the lecturers face in their teaching and the pedagogies they have used to try and engage students. In the interviews Sonia was able to talk about her own and other students' experiences of learning abstract algebra.

We explored the education literature and co-developed some teaching and learning activities based on pedagogies such as inquiry-based learning, concept images and example spaces, concept tests, active self-feedback and self-explanation training for proof comprehension.

Sonia produced a report summarising the theory and providing examples of the activities. This report has been shared with colleagues in the department and some of the methods have been adopted by lecturers this academic year.

5. Reflections

The corresponding author's experience of working with student partners has been very rewarding and fruitful. Academics and students bring their own expertise to the partnerships to create a deeper understanding of the interlinkage of teaching and learning to the benefit of all parties. Developing an effective partnership takes time and effort to overcome the academic-student power dynamic. It is important for students to be involved from the start to shape the direction and goals of the project. Regular communication is key to give student partners the confidence to challenge the academic and be involved in decision making throughout the project. If possible, it is important that the students are also involved in dissemination activities, although these may take place after the project is completed. Although the number of students that can be involved in these partnerships may be small, the quality of the interactions is rich, with an on-going dialogue across several weeks or months. The outputs of SaP projects may have more credibility with other students than those produced by staff alone, although we have not formally evaluated this.

Sophie and Sonia reflected on their experiences as student partners. Sophie commented:

"Overall, I have found my six weeks working on assessment literacy and feedback to be an interesting, fulfilling and enjoyable experience, and I have had some brilliant opportunities for self-development, both as a mathematics student and professionally. My ability to work independently and manage myself, while also remain collaborative and ask for help where needed is by far the most significant area of personal development which I will take away from this internship."

Sonia observed that "a key aspect of this project is the fact that its value lies on both sides, for lecturers and for students."

Sonia has written a blog reflecting on her experience of the project and at the LMS undergraduate summer school called 'The Summer I became a Mathematician'. This has been published in the December 2025 LMS newsletter and includes a link to the project report (Balan 2025).

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