

MANCHESTER
1824

The University of Manchester

The University of Manchester
Institute of Teaching and Learning

STEVEN BROOM DEVELOPING LEARNING INTERVENTIONS TO ELIMINATE UNEXPLAINED ATTAINMENT GAPS

ITL FELLOWSHIP 2020/21
PROJECT
REPORT

[www.staffnet.manchester.ac.uk/umitl/
teaching.learning@manchester.ac.uk](http://www.staffnet.manchester.ac.uk/umitl/teaching.learning@manchester.ac.uk)



ITL Fellow 2020/21

STEVEN BROOM

Steven is a Senior Lecturer and Admissions Lead in Mathematics. He spent several years in the Sixth Form College sector as a teacher and manager, followed by a period as an independent education consultant. Steven's 'Consolidation' course provides additional support to Mathematics undergraduates who will most benefit from it. He developed this approach further through his ITL Fellowship Project.

Fellowship Student Partner Interns

IRAM HASSAN
NICK THREADGOLD

IDENTIFYING AND SUPPORTING STUDENTS AT RISK OF UNDERPERFORMING

ITL Fellowship project

My project looked at developing, trialling and evaluating learning interventions that were aimed at eliminating unexplained attainment gaps. I developed the approach used in my 'Consolidation' course, which is taken by first year Maths undergraduates, and evaluated other possible practices.

Context

The Department of Mathematics had above average rates of non-continuation from first year to second year of its undergraduate programmes. Some work had been done to address this in the form of diagnostic testing combined with a zero credit 'Consolidation' course unit for those students identified as 'at risk'. This approach was somewhat successful but had been developed on a rather ad-hoc basis and was clearly misidentifying some students. Furthermore, some students enrolled on the Consolidation course were not engaging with it.

Objectives of the Fellowship project

1. To summarise existing research on identifying and supporting undergraduates at risk of underachieving.
 2. To gather information about how other universities are tackling this issue.
 3. To gather information about how other subject areas in the University of Manchester are currently tackling this issue.
 4. To seek feedback from current students in the Faculty of Science and Engineering (FSE) about the support they have received and the support they would like to have access to.
 5. To consider how the current approach of the department of Mathematics can be improved and what lessons can be shared with other subject areas in the University.
-

Project activities

1. Identifying and summarising existing research on identifying students at risk, and academic support interventions for undergraduates

This was an obvious first step which helped to focus the scope of the project. A range of PhD theses from around the world were identified and summarised. My Student Partner and I were able to contact some of the authors, who suggested other sources of information and supplied further contacts.

2. Identifying key people in departments across the FSE, and gathering information about systems and approaches in their departments

Several Directors of Teaching and Learning from across the Faculty of Science and Engineering were contacted and most shared details of their current approaches to academic support for undergraduates.

3. Designing and deploying a questionnaire for University of Manchester undergraduates

This took some time to organise as we went through the University Research Ethics Committee (UREC) Review process. We decided to target our questionnaire at second and third year undergraduates from across FSE, and to offer prize draws to incentivise participation. We ended up with a good participation rate and received over 120 responses. These responses were summarised and analysed by my Student Partner, Nick Threadgold.

The design of the questionnaire allowed us to group responses by department, gender, fee status and first year GPA. We asked the students for feedback on their previous exposure to academic support, and sought their opinions on what they would like to have had made available to them. Some results were surprising, while differences in responses between groups (e.g. UK vs Overseas) were not as pronounced as we had expected.

4. Running a Focus Group of undergraduates from across the Faculty

The focus group provided a great deal of additional information and some unexpected ideas. All participants agreed that they would like access to interactive online support sessions addressing core skills. Examples given were Further Maths topics, programming and IT skills (MATLAB, LaTeX, Excel).

5. Analysing and summarising feedback from Peer-assisted Study Sessions (PASS) questionnaires

We also sought feedback from PASS participants, as the PASS scheme in Mathematics is another means of academic support available to our students that runs separately from the Consolidation course. There were some recurring messages regarding preferred content and format for the sessions: Modelling how to complete coursework or lab reports - this boosted students' self-confidence and showed them how to approach new problems; Sharing tutorial solution sheets, exam past papers and other resources; PASS Leaders often signposted different resources to those suggested by lecturers; Using Kahoot (a game-based learning platform) as a revision tool - lecture content was easier to consume in this format for some students and the quiz style was more enjoyable; Using social media as an open forum where students could communicate informally with their PASS leaders; Offering biscuits and/or snacks which provided a direct incentive but, more importantly, differentiated PASS sessions from usual lessons and created a more welcoming atmosphere.

6. Improving the Consolidation course unit in response to project findings

Changes included:

- Involvement of a trained undergraduate student (UG) facilitator in each session, alongside the lecturer. These are all undergraduate students with an interest in teaching (e.g. they applied for our 'Mathematics Education' 3rd year course unit and are aiming for a career in teaching).
 - Part of each session is reserved for advice from - and Q&A with - the UG facilitator. (Topics covered so far include exam preparation, practical careers tips, discussion of what is to come in year 2 course units).
 - Final four sessions of the course unit now based around past exam questions, including advice and guidance on exam technique.
 - Attendance and weekly homework is used to help identify students 'at risk' during early weeks.
 - For semester 2, new students will be identified for participation in the unit based on various Blackboard metrics and semester 1 homework and test scores.
 - Semester 1 Consolidation students are being asked for feedback on their experience and we will be analysing their exam performance against their attendance on the Consolidation course.
-

Challenges faced

- I found it challenging to make connections with potential contacts at other Universities.
- I wasn't able to get detailed internal data on Blackboard usage (e.g. to gauge engagement) from departments other than my own in Mathematics.

Student partnership

Iram and Nick made significant contributions to the project, including:

- Gathering and summarising existing research on identifying at-risk students
- Gathering and summarising existing research on academic support for undergraduates
- Gathering opinions on Peer-assisted Study Sessions (PASS) and writing a report summarising their recommendations
- Writing a study guide for new first year Maths students (to be shared with incoming Maths students in September 2021)
- Creating the questionnaire we used to gather feedback from students across the Faculty of Science and Engineering (FSE)
- Obtaining approval for the questionnaire from the Ethics Committee
- Summarising responses to the questionnaire
- Helping to devise and facilitate the focus group session
- Summarising feedback from FSE PASS leaders and participants

Collaborative work

Information, feedback and opinions were sought from undergraduates and from Directors of Teaching and Learning throughout the Faculty of Science and Engineering. This was a key part of the project.

Professional Services colleagues in the Department of Mathematics helped me gather data relating to current first year Maths students. This included exam grades, test results and attendance records.

Outputs

1. The findings are leading to significant changes to the Maths Consolidation course and the way students are identified for it (see Project Activity 6, page 6, above).
2. I presented my findings, as well as the Maths Consolidation course, to Directors of Teaching and Learning across the Faculty of Science and Engineering.
3. The feasibility of setting up an Academic Support Advisory Group of interested undergraduates from across the Faculty is being investigated.

Impact

- Identifying students for Consolidation will be more rigorous and based on multiple data sources including a diagnostic test, weekly homework performance, Blackboard interactions and mid-term tests. Students identified later in the semester will be added to a Consolidation group in week 6.
- As before, the sessions will follow a flipped classroom mode, but we will recruit and train UG teaching assistants to help facilitate the live sessions.
- A flexible week-by-week programme will be set out at the start of the semester. Sessions will cover key topics in core modules, and part of each session will be devoted to topics such as careers, module selection, university life and study skills. These sections will be led by the UG assistants.
- In the second half of each semester the sessions will be based around past exam paper questions but still with the emphasis on understanding then building on the basics of the key topics. Exam technique and insights from past exam feedback will be integrated into these sessions.

Impact (cont.)

- We will disseminate our findings, and the approach to identifying and supporting those at risk of underachieving to departments, across the Faculty of Science and Engineering.

Reflection

The project was very successful, but with a necessarily narrower focus than I had originally anticipated as this is such a wide and complex field of study. The learning from the project will lead to improved academic support provision in the Maths Department and hopefully this will lead to other departments adopting aspects of our approach.

I have been able to identify an improved approach but not yet to fully test it in practice. In that respect the project will continue and our approach refined.

Next steps

We will run the new model of Consolidation in 2021/22 and assess its impact.

I will find opportunities (which may be very informal) to liaise with key colleagues across the Faculty about aspects of our approach that they could adopt.

I will also liaise with the Maths PASS (Peer-assisted Study Sessions) staff coordinator on aspects of the new approach.

Steven Broom
July 2021
