THE UNIVERSITY of EDINBURGH

INCLUSIVE PRACTICE CASE STUDY - 4

Transition courses
Fundamentals of Algebra and Calculus
School of Mathematics

OBJECTIVE(S)

The School aimed to develop a first-year undergraduate course that developed an equitable foundation of knowledge for semester two and addressed attainment differences among new students, by providing specific transition support into semester one of University maths.

ACTION

In 2018/19, the School introduced the semester one Fundamentals of Algebra and Calculus (FAC) course, which is recommended to some entrants, according to their prior qualifications and their results in a pre-sessional maths diagnostic test. Course design drew on ideas and evidence from cognitive science and education research.
The course was delivered online, with autonomous learning groups assigned to encourage community building and non-assessed collaborative work.

LEARNING

1. FAC transition course eliminated gaps

Two Maths Diagnostic Tests are undertaken by first-year students: one is optional and pre-sessional, and the second forms early assessment in semester two. Analysis of students' results indicated that FAC led to significantly improved performances between the two tests, seemingly eliminating attainment gaps among new students.

2. Student feedback noted benefits & challenges

Qualitative data showed that most students found the course helpful, felt they would recommend it to others, and appreciated the flexible design. Some found the online delivery isolating and the workload/mark expectations high, and reported 'gaming the system' strategies.

3. Further curriculum review and re-design

Broader curriculum review will embed existing School practices such as peer-learning and flipped lectures. A new 'Introduction to University Maths' course will be integrated into the 2025/26 first-year undergraduate curriculum.

ADAPTIVE PRINCIPLES

- First-year transition courses designed to ensure all students develop required knowledge and skills
- Quantitative data analysis to evaluate impact on student attainment
- Qualitative student feedback to further gauge impact
- Broader curriculum review to ensure first-year brings all students to equitable stages

AT A GLANCE

CHALLENGES

- Differences in knowledge foundations for incoming first year students and related progression and attainment gaps

BENEFITS

- Elimination of attainment gaps for first-year entrants
- Evidence for the value and impact of transition support in addressing progression and attainment gaps
- Further transition support courses planned

RESOURCES/OUTPUTS

- FAC course 2023/24 DRPS entry
- FAC course Path page
- 2019 Principal's Teaching Award Scheme project page, including final report
- 2021 Teaching Matters blog post
- Published paper in the International Journal of Mathematical Education in Science and Technology, 2021, which shares the principles of course design and evaluation, and outlines evidence indicating that FAC has helped to reduce progression and awarding gaps for incoming students