Better student preparation needed for university maths: UK study

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Moving from sixth form, or college, into higher education (HE) can be a challenge for many students, especially those who start mathematically demanding courses. Life prior to university focuses on achieving maximum examination success to be sure of a place. Faced with this pressure, school and college maths courses pay little attention to preparing students to use maths in other areas of study according to a project funded by the Economic and Social Research Council (ESRC).

A student's ability to apply mathematical reasoning is critical to their success, especially in HE courses like science, technology, engineering and medicine. The study, undertaken by Professor Julian Williams, Dr Pauline Davis, Dr Laura Black, Dr Birgit Pepin of the University of Manchester and Associate Professor Geoffrey Wake from the University of Nottingham, shows that it is important to understand how students can prepare for the 'shock to the system' they face and how they can be given support at school, college and university to help in the transition.

The researchers found that students were not fully aware of the importance of the mathematical content in the courses they had joined at university, and particularly how to apply maths in practice.

Associate Professor Geoffrey Wake states, "Different teaching styles of university lecturers and the need for autonomously-managed learning, where students need to learn some mathematical content of their courses on their own without input from lecturers, also came as a bit of a shock

for many students. On the other hand, some of the lecturers had limited knowledge of the exam-driven priorities of A-level maths courses and were not aware of the techniques students had been taught prior to attending their university courses."

The researchers also found significant problems in motivating students to engage with the mathematics within their chosen university coursewhere mathematics was not their main area of study. Generally, schools and colleges were found not to be preparing students for university learning practices, and the level of learning-skills support was variable once students arrived at university.

"Many students felt that they would benefit from student-centred learning and greater opportunity for dialogue with their lecturers," says Associate Professor Wake. "Unfortunately, the efficiencies required of university teaching resulting in lecturing of large numbers of students makes developing such a learning culture unlikely."

The findings led the researchers to consider the implications for the policies and practices of schools, colleges and universities recommending a better two-way flow of information between schools and colleges and universities to address the issues of preparation and expectation.

They concluded that the sixth-form curriculum should provide 'learning to learn' skills and mathematical modelling for students following A-level maths courses.

Provided by Economic & Social Research Council