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# THE MATHS ADVICE BOT: TOWARDS PERSONALISED, TRANSITIONING OF STUDENTS INTO FIRST YEAR SCIENCE

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## ABSTRACT

Entering university can be a daunting experience for first-year students, with many reporting a low sense of belonging fueled by the imposter syndrome. Such feelings can be heightened in Science subjects, which often rely on background subject knowledge, either through formal prerequisites or informal assumed knowledge. In particular, matching a student's mathematics background to appropriate level units is crucial for academic success. However, advising students is a complex task given the wide diversity of high-school curriculums, both domestic and international, and the decline of qualified mathematics teachers in the high-school sector.

Our project focuses on how to give timely, evidence-based advice to incoming higher-education students, regarding what mathematics units they should choose, and what mathematics support they might need, including pre-semester bridging courses. First, we present historical data showing interesting patterns in student performance against student mathematics background. Second, we outline four sources of data which inform decision making: historical student performance data, institutional documentation, equivalence mapping for high-school mathematics curriculum, and unit learning outcomes mapped to high-school background. Third, we introduce the 'Maths Advice Bot', which is an AI generated chatbot agent which gives interactive, personalised advice to students. To conclude, we discuss how our findings are transferable across institutions and across subject areas, dependent on high-school background, like Physics and Chemistry.

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