



Sustained Excellence in Tertiary Teaching General Category

Dr Cami Sawyer

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“Excellent teaching is about being a ‘connectionist’, getting students to think about new concepts and make connections with earlier learning.”

As a maths teacher, Cami Sawyer is a ‘connectionist’. Her teaching philosophy is based in Situated Learning Theory, a model that draws on the sociocultural research of Vygotsky. This theory states that teachers and learners are active participants in the learning process. She encourages students to make connections with earlier learning and overcome barriers they may have created to learning maths, such as believing they can’t learn maths or see how it connects to their future goals. Cami creates a supportive learning environment with carefully planned, learner-centred and engaging lessons. As her teaching is increasingly in the online classroom, she constantly develops new skills and strategies to help her role as connectionist.

As Senior Mathematics Tutor at Massey University’s School of Fundamental Sciences, Cami teaches a wide range of students, from teenagers straight out of high school, to international students from varied education systems, and second-chance students, with families and full-time jobs, looking to make a life change. She teaches science students, business students and trainee teachers. For all of these students, a maths course is a compulsory requirement to achieving their goal.

Improving course design and course materials is integral to Cami’s teaching approach. When she started at Massey, she discovered that some of the core maths courses were not aligned with NCEA. In addition, courses were designed to teach skills in isolation with little focus on inquiry-based learning or creating connections with prior knowledge. During 2013–2014, she redeveloped two university preparation courses that were aligned to NCEA and changed the learning focus to emphasise conceptual understanding from multiple points of view. This redesign particularly helps students with weak maths backgrounds or who had been out of study for a long time. She more recently redesigned her Introductory University Maths, a course which is compulsory for a range of programmes, to better align with NCEA and scaffold learning. She also rewrote the study guide, using plain language and giving more examples.

Cami believes that, whilst curriculum design is critical, the design of teaching and learning activities is equally important. With distance courses, the design of the course in the learning management system (LMS) is integral to its facilitation. Cami works with students to build effective learning strategies that help them persevere and complete difficult tasks. Realising the printed study guide that she inherited was inadequate, Cami took a course on online learning design, redesigned the LMS site, and focused on making the ‘story’ of the course central. She created a welcome video that explained the key academic goals of the course and established her ethic of care. She also divided up the course to help students pace and prioritise their learning, using videos to introduce and present concepts.

A key feature of Cami's teaching is finding the areas on the edges of new learning, that may or may not already be understood, and asking questions around these. She believes that learning occurs at these moments, where students can see that a concept is not as straightforward as they first thought or that another student can understand it in a different way. She finds that getting the students to discuss these differences, either in class or online, helps them to create connections and have more investment in the concept.

As surface learning is likely to occur when students are anxious, working under time-pressure, or have low or limited expectations of success, Cami uses learner-centred approaches to design lessons that facilitate deeper learning. She strives to engage students by building their confidence in working with concepts, as well as incorporating history, applications, and humour into her teaching. To better connect with distance learners, Cami changed to more frequent email contact. To encourage students to ask questions in class, she created the 'There are no stupid questions' anonymous message page, which had a positive outcome.

Recognising that most distance students fit study in between other demands on their time and that most of her communication is asynchronous, Cami initiated synchronous weekly 'e-tutorials' to give students more real-time engagement. She uses Adobe Connect, simultaneously running an iPad with a whiteboard app and a PC showing student questions and comments.

Cami strives to strike a balance between demonstration and student-led creation. Instead of providing neat, organised notes for her students, she shows them best practice for laying out working and encourages them to 'create' mathematics and think about why each step makes sense. She fosters an environment where making mistakes is accepted as part of the process of doing mathematics and believes that catching and correcting mistakes develops a deep approach to learning. She demonstrates when maths technology is useful and uses online tools, computer programmes and hand-held technology such as calculators and mobile apps. For distance learners, who are taking the courses from all over the world, Cami uses video, a practice she was one of the first to adopt. These videos are not recordings of internal lectures, but bespoke teaching sessions, structured to help the learning of distance students. She creates a 'story board' of the lecture and acts as a 'guide on the side', being clear and concise, but incorporating humour. Since 2015, Cami has produced 186 of these videos, of which there have been 58,000 views.

Cami's outreach to local area teachers and students is extensive. She helps to run a competition for year 12 students, a Maths and Stats Forum (to connect Massey staff, area teachers, and industry), and Science and Maths Scholarship workshops for top year 13 students. She helped set up, and continues to work with, the Massey Māori Science Academy – Pūhoro. She also gives demonstrations to year 10 students when they visit Massey and organises the mathematicians for Open Day. She has convened the NZMS Education group since 2017, co-founded the NZ branch of FYiMaths (First Year in Maths) in 2016, and connected with university mathematicians, the Ministry of Education and NZQA in response to the NZ NCEA review in 2018. She established a gathering of Lower North Island Women in Mathematical Sciences, and has worked with the Pūhoro STEM academy since 2015 to develop their programme and create better understanding of the needs of Māori students between academics and NCEA.

"It is important for students to understand that hard work, rather than innate ability, is essential in learning maths."

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