

# Students gain most from maths-interests balance: Maria Vlasidou

JOHN ROSS THE AUSTRALIAN 12:00AM February 22, 2017

Curriculum designers should not second-guess women's appetite for hard numbers, says visiting Dutch mathematician Maria Vlasidou.

"Students may have general interests that are not hardcore maths," Dr Vlasidou says. "But you find the balance between giving them the correct mathematics background, so that their computations are mathematically sound, and the background that's necessary for their interests.

"There is a balance, and the question is not whether it is achievable. I know it is achievable; we have achieved it. A bachelor's degree has 180 credit points. The question is, how many go right and how many go left?"

Dr Vlasidou's lecture tour, which was organised by the Australian Mathematical Sciences Institute and wraps up today in Sydney, has coincided with a local controversy over the "feminisation" of maths.

In an Australia Day address, University of NSW quantum physicist Michelle Simmons said the replacement of formulae with essays in schools about two decades ago in an effort to attract more girls to physics had left many students ill-equipped for university. The NSW Education Standards Authority has since backtracked, saying science courses to be introduced next year will focus more sharply on mathematical applications in physics and chemistry.

Dr Vlasidou, of Eindhoven University of Technology, said the idea that science had to be more word-based to appeal to women was insulting. "Why should I not like numbers if I like words?" she said. "Why is it either/or? I appreciate a good book, but I do not teach maths with a novel. Physics is not a history lesson. If I wanted a history lesson, I would study history."

Dr Vlasidou's research focuses on "stochastic" processes — a branch of probability theory - involving a collection of random variables — and queuing theory, the mathematical study of waiting lines. She said her work had applications in real-world problems, from protecting power supply and recharging electric cars to running better health services.

She said training should meet students' objectives, not assumptions about their interests, citing one of her own students who is investigating improvements to the Dutch health system.

"That student needs a lot of maths to understand how to evaluate the performance of these processes and how interventions will change the system. She also needs to understand the reality of doctors and nursing. You cannot have a mass solution that ignores the fact that nurses cannot work 20 hours a day."

In 2011, Eindhoven began redesigning its science curriculum to address "serious problems with student intake". Its analysis suggested it was mainly attracting "pure science" — people

intrinsically attracted to engineering, who accounted for about one-sixth of science students across The Netherlands — but was failing to lure people who were motivated by wider global and social goals and did not automatically gravitate towards technical study.

The solution involved giving students access to more social and management subjects and allowing them more freedom to tailor their studies, guided by “professional coaches”. Dr Vlasiou said the changes succeeded without “dumbing down” the studies.

“We have managed to improve in all aspects,” she said. “We have more women entering mathematics, and we have increased our overall (intake) to the point that we have started capping the number of students.

“The percentage of students who finish their studies is better. The bottom line is, there is something to be said for attuning your studies to societal needs.”

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