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The importance of teacher upskilling in physics: Insights from the design and delivery of a Physics Skills Enhancement Micro-credential

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Australia faces a significant shortage of qualified high school physics teachers, with over 1 in 5 reportedly teaching "out-of-field". This scarcity negatively impacts student choices and success, contributing to a broader skilled worker shortage. There is also substantial demand for individuals with physics skills to support the Australian Government's investment in nuclear technology and to build an AUKUS-ready workforce.
To address this skill gap and better prepare students for future STEM success, Flinders University designed and delivered a Micro-credential Physics Skills Enhancement course (MCPSE) in 2025. The key objective of this course is to upskill teachers and equip them to deliver physics effectively, thereby preparing students for careers in high-demand industries such as nuclear, defence, and submarine construction. The course is open to both physics and non-physics teachers and has no prerequisites. Its content is comprehensive focusing on building nuclear and submarine physics knowledge, training teachers in using hands-on demonstrations and storytelling approaches, and developing experimental skills using the tools of physics.
Initial findings from the pilot intake, which included teachers from South Australia (SA), Northern Territory (NT), and New South Wales (NSW), suggest the course is highly valuable. Teachers reported that it equipped them to utilise unused science equipment in their schools and affirmed that the course was meeting their needs for future teaching. Early indications show that the program is effectively boosting teachers' confidence in delivering physics through hands-on methods. The strong demand for the course is evident, as teacher enrolments more than doubled for the second intake, which now includes teachers from across Australia, encompassing various states and regional areas like Victoria (Vic), Queensland (QLD), Western Australia (WA), NSW, SA and NT. These preliminary findings underscore the importance and high demand for teacher upskilling in physics.

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