OPINION

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EDITORIAL

Urgent need for better STEM education performance

The world is undergoing a technological transformation. As a result, education systems need to be constantly aware of ongoing shifts and nimble enough to adapt.

But there are question marks about whether this is the case in Australia. Alarm bells have been ringing for some time about our performance in the subjects that will play a key role in the future — the so-called STEM subjects of science, technology, engineering and maths.

Last year, the National Science Statement, released by the Federal Government, said Australia was at risk of being unable to supply a skilled workforce unless changes were made.

It said participation in STEM subjects in Australian schools was declining, with enrolments in these subjects at the lowest level in 20 years.

"Australia's performance in STEM subjects is also slipping. In the Program for International Student Assessment, Australia's performance in school-level scientific literacy and mathematics is reported to have declined not only relative to other participating countries but also in absolute terms," it said.

"If this decline in participation and performance continues, Australia may be unable to supply the skills required for the future workforce."

The West Australian reported yesterday on a new report which also addressed the topic. The report on challenges in STEM learning in Australian schools, released by the Australian Council for Educational Research, said STEM education was "caught in a whirlpool of problems" that were contributing to one another.

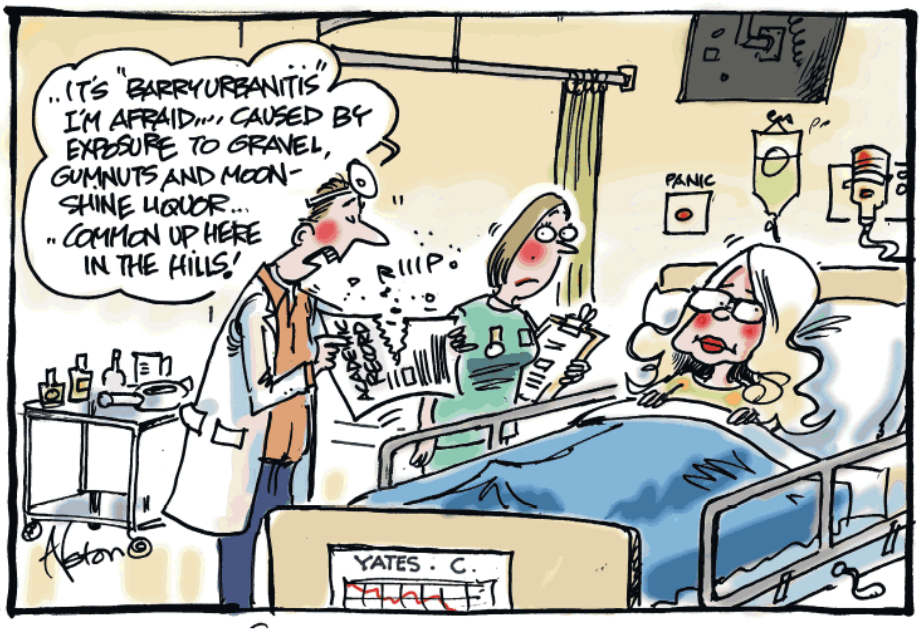
It suggested that schools could improve results by broadening students' access to STEM learning, rethinking the STEM curriculum and building the teaching workforce. Co-author Michael Timms said that the establishment of more specialised STEM schools could increase student engagement.

The report followed publication of figures which showed WA's Year 12 students were deserting harder subjects, including physics and chemistry.

Numbers also fell this year for mathematics applications, but the introduction of bonus marks last year for the two hardest courses — mathematics methods and mathematics specialist — coincided with a rise in enrolments in those two subjects.

There is a valuable clue here. If students think taking on a hard STEM topic will work to their advantage when scores are tallied, enrolments will surely follow.

Getting the kids in the door, combined with inspirational STEM teachers, are two positive steps.



Smart technology the way to future studies

Gary Martin

There is a revolution sweeping Australia's university sector that is impossible to ignore, and which will deliver an interesting case study in managing a change in consumer habits.

In this case the consumer is the student, who increasingly wants a new university experience based on what might be called an anywhere anytime model of studying — as and when they want and mostly remote from the campus environment, and at their pace.

This model reflects the latest generation's attitude to retail, banking, communications and pretty much anything else that can involve technology. The smart university is already trying to adapt the way it delivers courses. But this shift to ensure the student has a "superior" learning experience is likely to come with upfront capital outlay to ensure the enabling technology and support is in place.

This is where the double whammy strikes. This month's Federal Budget confirmed the cash freeze for universities that was flagged by the Government in December when it said it planned to cap funding for university places at 2017 levels. This all but ends a largely demand-driven funding system through which the Government provided funding for every enrolled student.

It comes when many universities are contemplating how to meet growing expectations of future students to provide a next-generation experience, one that puts students at centre stage — that will inevitably require upfront investment, though it might also deliver cost savings down the line.

University leaders will argue they aspire to provide a "superior" student experience. But what might a superior student experience mean in a repositioned model — say 10 to 15 years into the future? It is likely to offer a high degree of personalised learning and support and will be responsive to a student's circumstances outside university life, such as part or full-time work, family or care responsibilities and community commitments.

To deliver that superior experience, university leaders will need to jump on to the technology-enabled bandwagon the way the corporate, retail and manufacturing worlds have adopted automation and artificial intelligence technologies to transform their industries.

An anywhere anytime experience is likely to be largely a virtual undertaking, which allows students to commence a course at any time, without the barriers of semester or trimester intake periods. There will be no requirement to attend face-to-face classes because the virtual experience will make use of advanced technology to connect students with highly interactive content, other students, and academic and support staff. And just like many in the retail, banking and communications sectors provide 24/7 support, so too will universities need to deliver academic and administrative services outside regular office hours to meet students' expectations for increased flexibility.

Unlike traditional models, where a standard degree might take three, four or more years to complete, universities will offer students the flexibility to fast-track completion by making use of a full calendar year and choosing not to take the traditional lengthy semester vacations.

And just like a student can enrol in a course anywhere anytime, they will be able to submit assignments or sit exams when they are ready academically and personal circumstances allow it.

Some will argue that no matter how good the technology, the experience will remain inferior to a face-to face education. How will students, for example, learn vital soft skills including communication and teamwork if they are not interacting with real people in face-to-face classes? The answer lies in the structure of degree programs. There will be ramped-up and compulsory doses of workplace experience, often called work-integrated learning. And face-to-face support will remain part of the solution. Universities will augment the anywhere anytime virtual experience by positioning small student support hubs around the nation in major student catchment areas.

The best students will flock to where the best student experience is on offer, with potentially mass migration of student places across State boundaries.

But the question is: will Australian universities have the financial ability to deliver an anywhere anytime student experience and remain internationally competitive?

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