

Dear Professor Kieu,

**Ref: The impact of the shortage of Design and Technologies teacher on the delivery of STEM education in Victoria**

I am writing to you on behalf of the committee and members of DATTA Vic, the professional association for teachers of Design and Technologies in Victoria.

We were delighted to read of your appointment as Victoria's STEM Education Ambassador as part of the Government's commitment to improving STEM opportunities and outcomes for all students.

We have recently read a copy of the *Victorian Teacher Supply and Demand Report* for 2018. As the data shows, there is a critical shortage of Design & Technologies teachers, and our association is delivering a range of initiatives to address this. However, we were very disappointed to see on page 81 of the report that **Design and Technology** (now Design and Technologies) is listed as a "Non-STEM Subject".

The Design and Technologies curriculum covers the 'T' and 'E' of STEM. **Engineering Principles and Systems** is one of the contexts that is taught from Foundation through to Year 10, and our members also teach VCE Product Design & Technology and VCE Systems Engineering. Not only are these areas explicit within the Design & Technologies curriculum, but our focus on using design-based learning, creative problem solving and addressing real-world issues are a cornerstone of STEM education as applied in each of the Tech Schools in Victoria.

We have raised this issue with; David Robinson, DET's Director of Early Childhood and School Education Reform and Timothy Binks, Acting Project Director, Workforce Strategy Unit at a meeting on 19 October, but we feel that further action is required to address this situation.

Victoria has a critical shortage of qualified Design and Technologies teachers. Last year we carried out an extensive survey with teachers throughout the state, and the results are alarming. 94% of Victorian schools have had difficulty in recruiting teachers for vacant roles, and 86% of schools have been forced to use teachers from other learning areas to deliver the Design and Technologies curriculum.

We understand that the government plans to make record investments into STEM education, including ten new Tech Schools, \$17.8 million to fund teachers to become qualified maths or science educators and \$33 million to train 200 primary teachers in maths and science. While we welcome all initiatives which support students to excel in STEM, I hope you agree that the absence of Technologies and Engineering - the 'T' and 'E' of STEM – is a drastic oversight, and the fact that the DET has indicated that Design and Technologies is not a STEM area in their workforce planning report is of grave concern.

I have included below our *Case for Improving Design & Technologies Education in Victoria*. We would be delighted to discuss our learning area's crucial place within STEM education with you, how we already contribute positively to the DET's VicSTEM agenda through a wide range of projects and partnerships and what impact the critical shortage of Design & Technologies teachers will have on the future success of STEM education.

I look forward to hearing from you at your earliest convenience.

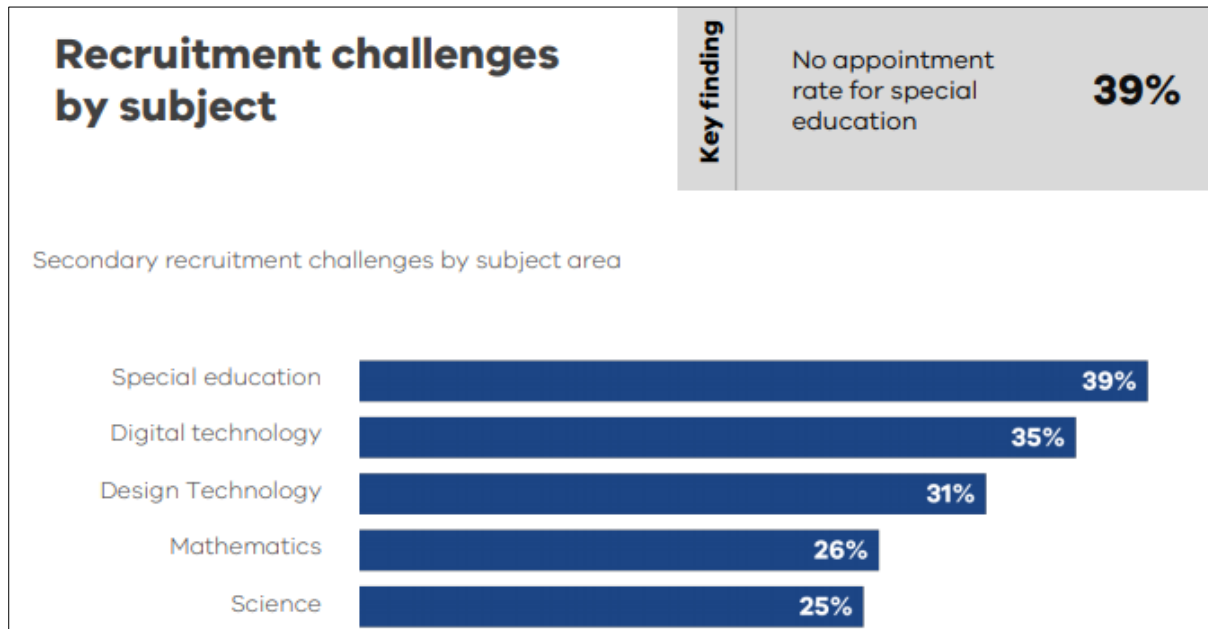
Yours sincerely,



Travis Burroughs  
DATTA Vic President

## Case for Improving Design and Technologies Education

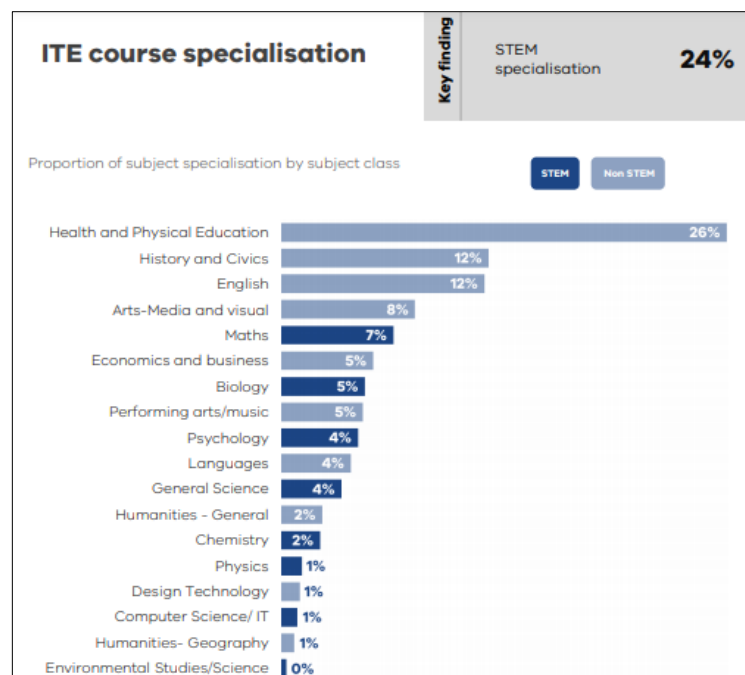
The “Victorian Teacher Supply and Demand Report 2018” published earlier this year clearly indicates that Secondary Technologies teaching roles, including Design and Technologies and Digital Technologies, are the hardest to fill in Victoria after Special Education roles.



In the same document (Page 80), Design and Technologies was also not listed as a STEM subject. This indicates that there is a fundamental misunderstanding about the Design and Technologies learning area and its relation to STEM pathways and careers. It is therefore clear that Design & Technologies teachers are being prevented for accessing funding and support for developing and leading STEM initiatives in their schools.

The Department of Education and Training have developed ten Tech Schools that are centres of science, technology, engineering, and mathematics (STEM) excellence.

Each of these innovative schools have utilised and developed their own approach to STEM projects for partner schools using Design Thinking / Design Process, collectively called Design Based Learning – the very foundation of the Design and Technologies curriculum. The Tech Schools are now delivering “Introduction to Design Thinking” teacher professional development workshops, recognising the importance of this approach in STEM education. While these are beneficial programs for partner schools, this does not help teachers from other areas, nor does it cover how to teach the Design & Technologies curriculum.



It is not only the Tech Schools that have identified this key connection between STEM education and Design Thinking. Andresa Schleicher, Division Head and coordinator of the OECD Programme for International Student Assessment (PISA) and considered as one of the most influential experts in education, identified Design Thinking as one of the five key areas for promoting economic growth and social progress as part of the transformation of education. It is also worth noting that PISA will also be assessing Creative Thinking from 2022, a core feature of Design and Technologies education.

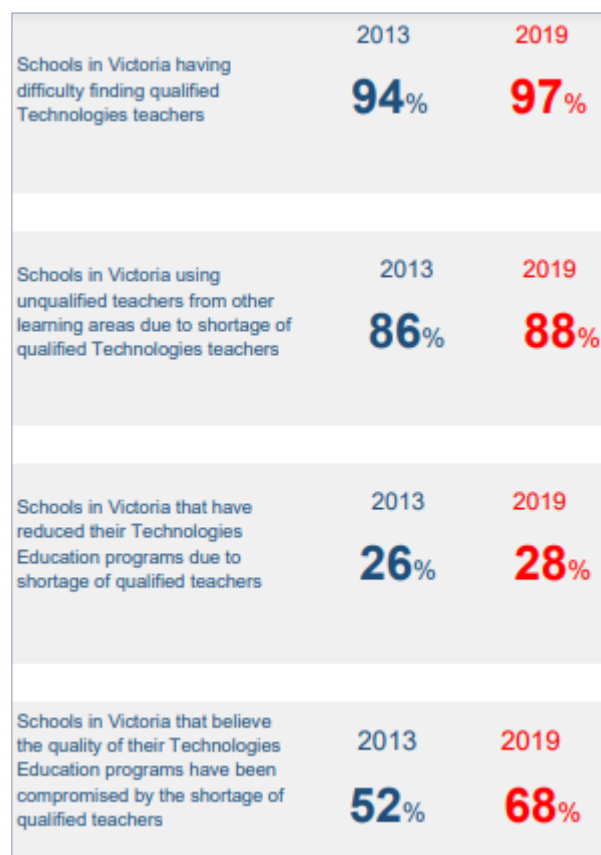
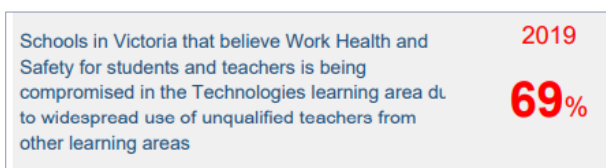
For Australia to recover from the economic impacts of Covid-19 and to truly transfer into a successful 21<sup>st</sup> century economy, our students must learn to be innovative and creative problem solvers. The world is facing global issues around climate change and sustainability, which are also a key focus area for Design and Technologies education. Technologies education is now primarily about creating “Preferred futures”, and sustainability is mentioned more in Victorian Curriculum “Design and Technologies” (37 times) than in any other subject; Science (2), Maths (1), Geography (19), Digital Technologies (11).

By contrast Design and Technologies is only mentioned once in the Department of Education and Training’s “STEM IN THE EDUCATION STATE” document produced in 2016.

Unfortunately, In Victoria we are not taking advantage of a progressive and vital learning area because of poor implementation of the Technologies curriculum by untrained teachers, which has resulted in a very misguided perception of what is possible in this subject.

DATTA Australia conducted a survey in 2013 and 2019 on the demand for Technologies teachers in each state. DATTA Vic published a [report](#) on their website that clearly illustrates the ongoing crisis in Victoria.

Nearly all schools are struggling to find qualified Technologies teachers, resulting in poor educational outcomes and severe reductions in the Technologies offerings in many schools.



<https://www.datta.vic.edu.au/content/technologies-teacher-shortage-crisis>

Aside from the obvious health and safety issues of using teachers from out of area to cover these shortfalls, it is also clear that the learning area is not being delivered as intended by the Victorian Curriculum and Assessment Authority. This means most students in Victoria are being deprived of the vital 21<sup>st</sup> century skills and knowledge they will require in the future.

As demonstrated by the Department of Education and Training Tech Schools initiative, good Design and Technologies education is critical to good STEM education. However, we fear this may no longer be possible in Victoria as the last University to have an active Technologies education course (La Trobe

University) has just announced that it will no longer run due to the impact of Covid-19. Their long-running Bachelor of Technology Education is now in “Teach Out” mode and will no longer accept students onto that course.

We have recently become aware of a teacher upskilling course in Western Australia through Edith Cowan University. A Department of Education scholarship of \$10,000 is available for each teacher who undertakes the course. There are currently 40 teachers being upskilled.

### **Graduate Certificate of Secondary Education (Design and Technology) – L80**

Edith Cowan University - Duration: 1 year part-time

This course provides both a refresher and a consolidation of content skills for motivated and academically capable teachers to re-train in the teaching of Design and Technology up to and including Year 10.

Whilst the content of this course would differ in Victoria, we would like to see the Department of Education and Training consider a similar program and partnership with a Victorian

University or with DATTA Vic to help increase the numbers of trained Technologies Teachers - especially as we know that over a quarter of the current Technologies teachers are about to retire.

Percentage of Technologies Teachers in Victoria predicted to leave the teaching profession over the next five years. **2019**  
**27%**

In the absence of any other upskilling opportunities from Universities or RTOs, DATTA Vic has run two week-long “Teaching Design Masterclasses” which aim to support out of area teachers to deliver the D&T curriculum in a relevant, engaging and safe manner, and how D&T teachers can lead. STEM education in their schools. We are currently seeking grant funding to allow us to pilot an on-line version of the course for regional teachers. These masterclasses have been extremely successful, but we have limited capacity to extend their reach.

We hope it is clear that Design and Technologies education must be recognised as a STEM subject throughout all sections of the Department of Education and Training and that key organisations like

DATTA Vic are included and consulted upon when investing in STEM education in Victoria. This will help to address the issue that the vast majority of current Design and Technologies departments in schools have received no direct STEM funding.

DATTA Vic understands that this is still a challenging time for education, but we would like to help build better Technologies education for the future of all Victorians. We would be especially keen to share the innovative practices that our teachers developed during “remote learning”, another strong indicator that Design and Technologies can be a centre of innovative education in every school if properly staffed, trained, resourced and supported.

### **References**

- [Victorian Teacher Supply and Demand Report 2018](#)
- [Technologies Teacher Shortage Report Victoria 2019](#)
- [Open letter written to the Minister for Education, February 2020](#)
- [Open letter written to Victorian Ministers on the impact of the Teacher Shortage, February 2020](#)
- [STEM IN THE EDUCATION STATE](#)

Number of schools that have indicated they have received no direct STEM funding, resources or support **2019**  
**67%**