

# Why is Engineering virtually invisible in the Middle School Years?

To answer this question, we must review the history of technology and engineering education.

## The industrialisation of education

The industrialisation of education started in Prussia in the late 19<sup>th</sup> and early 20<sup>th</sup> Centuries where its aim was to create a standardized system of education that would produce disciplined, obedient, and patriotic citizens for the state. This model was enthusiastically adopted by other European countries and eventually by the United States.

Peter Board, Superintendent of Education for NSW between 1880 and 1910, brought the Prussian model to NSW with the creation of a standardized curriculum, the establishment of teacher training colleges, and the implementation of a system of school inspections and standardized testing. This model remains in place today.

## Technology education

Technology education in the early 20<sup>th</sup> Century was primarily concerned with teaching the skills required by the workers needed for the assembly lines of the factories and mills of the industrial revolution. These were trade skills and taught as such.

Science and Mathematics on the other hand, together with Humanities, were regarded as “academic” subjects and taught as disciplines, where progress through the education pipeline towards a university degree and a high-status career were a given. Teachers of Technology struggled, and still struggle, to receive the respect that teachers in the more “academic” disciplines are afforded.

## Engineering as a discipline

With the establishment of TAFE in NSW 1949, the teaching of trade skills started to move outside of the NSW school system. This was at the same time as experiential learning, ie learning-by-doing, or “making”, rather than learning by rote, was gaining ground in education systems around the world.

In the 1950's, the NSW based Institute of Industrial Arts Australia promoted this new approach, and the NSW curriculum started to reflect a design thinking and maker approach to the teaching of technology subjects. A design focussed course was introduced in 1978.

Engineering as a specific discipline did not enter school classrooms until NSW introduced a world first Engineering Science course for HSC students (years 11/12) in 1966. This was followed by another world leading engineering course for years 9/10 introduced in 2000.

In 2015, a cross-disciplinary Years 9/10 elective programme called iSTEM was introduced in NSW to provide students with practical, real-world learning experiences in science, technology, engineering, and mathematics. This is an increasingly popular elective.

Australian Technologies curricula in early years now focus much more on engineering concepts such as design thinking and a multidisciplinary mindset. It is therefore ironic that students and many of their teachers are unaware that they are actually teaching and learning engineering!

## The answer to the question

Engineering is practically invisible in primary school, and barely visible in the mandatory Years 7/8 of secondary school, because it only emerges from the Technologies curriculum from Year 9 onwards.

The Middle School years are where students are guided towards the most appropriate education pathways to achieve their goals in life; where they work out what they would like to do. If they don't know about engineering, they are not going to choose the STEM subjects in later school years that lead to an engineering career.