



An Australian Government Initiative



Parliament of NSW

Legislative Council: Standing Committee on State Development

## **Defence Industry in New South Wales**

Supporting information  
Question Taken on Notice by the  
Hunter Business Chamber

regarding

**RDA Hunter's ME Program**  
(STEM, school -industry pathway)

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## Defence Industry in New South Wales – Discussion Paper

### CONTEXT

*The CHAIR: I would like to hear a bit more about the ME Program run by RDA Hunter. How was it developed?*

*Was it a success to the extent that it should be replicated throughout New South Wales?*

*Mr HAWES: I will have to take that on notice and get some details (from RDA Hunter). I know that they speak highly of the outcomes they got from the program. I suggest that we take it on notice or refer directly to RDA Hunter. I think they would welcome the opportunity to provide further comment.*

### RDA HUNTER'S ME PROGRAM

RDA Hunter appreciates the Committee's recognition of the ME Program and the contribution it makes to defence industry. We also appreciate and are grateful for the support the ME Program receives from business and industry leadership organisations in the Hunter, - the Hunter Business Chamber, HunterNet and AiGroup.

A brief history of RDA Hunter's ME Program as a School Pathways and Industry Skilling program, may assist understanding of its effectiveness and potential.

Regional Development Australia (RDA) Hunter was formed in 2009, as a result of the amalgamation of the Hunter Economic Development Corporation (HEDC), a state association, and the Hunter Area Consultative Committee, a Commonwealth body.

In our first year, RDA Hunter was contracted by the Commonwealth of Australia, through the Department of Defence (Defence Materiel Organisation), as the legal entity to provide the preliminary work for the Advanced Manufacturing School Pathways Program (AMSPP). Initial scoping for this work had been conducted by HEDC.

Following this preliminary work on the viability of the AMSPP, the Commonwealth contracted RDA Hunter to deliver a pilot program, involving four high schools and four industry partners. During the pilot phase in 2009 and 2010, under the banner "Manufacturing Success Through Education", the School Pathways Program became known as the ME Program.

Successive contracts with the Australian Department of Defence have given RDA Hunter the capacity to create, deliver and manage the expansion and successes of the ME Program.

RDA Hunter's ME Program is a Defence Industry skilling program to raise student's awareness and knowledge of Defence and defence industry career pathways whilst increasing the number of students undertaking STEM subjects in participating schools and increasing the size of the STEM skilled workforce.

## SNAPSHOT OF ME PROGRAM ACHIEVEMENTS

Since 2010 – 2011, at ME Program high schools, overall **participation in STEM subjects** had **increased by 19.22%** by the end of 2017.

From 2010 to 2017, the NSW State average uptake of STEM subjects fell: **-0.5%**.

At ME Program schools for this period, individual subject increases were:

Biology, **13%**;

Chemistry, **30%**;

Engineering Studies, **22%**;

Mathematics 2 Unit, **7%**,

Mathematics Extension 1, **32%** and

Software Design & Development, **12%**.

In early 2018, there are over 210 high schools in NSW endorsed and equipped to deliver iSTEM, to around 7,500 students.

In 2016-2017 there was a **45.7%** increase in the number students who were involved in various STEM intervention activities provided by the ME Program.

In 2015-2016 there were approximately 8,762 student contacts (not including iSTEM). In **2016-2017 there was a total of 16,132 student contacts** (not including iSTEM). These activities have been designed to expose students to employment pathways related to STEM and Defence Industry.

The ME Program has facilitated **STEM teacher only site visits** to defence industry locations. This provides one on one interactions between specialist STEM teachers and industry engineers and personnel.

## BUILDING THE STEM WORKFORCE FOR THE FUTURE

RDA Hunter delivers STEM Workforce Development initiatives to support a strong defence industry sector as part of the Hunter's economy. A STEM skilled workforce enables innovation-driven growth and industry competitiveness.

Since 2009, RDA Hunter has been undertaking activities to STEM skill the region's future workforce. These initiatives are collectively known as RDA Hunter's STEM Workforce Development Initiative.

The three components, Mini ME, ME Program and STEMship, are life-stage specific, education programs that together create a pipeline of opportunities, activities and networks for students from eight to 18 years old.

**Mini ME** – STEM intervention program for primary schools (Engaging Years 5 and 6);

**ME Program** – Increases the number of students undertaking STEM subjects in participating schools. Our Defence Industry skilling program raises student awareness and knowledge of Defence and defence industry career pathways. (Inspiring Years 9 and 10)

**STEMship** – An innovative Vocational Education and Training (VET) pre-employment program incorporating Science, Technology, Engineering, Mathematics and Entrepreneurship skills and capabilities. (Developing employability)

In close partnership with local industry, which includes defence prime contractors, multi-nationals and SMEs, students are immersed in industry focused and designed curriculum as well as professional placements and work experience.

## **INDUSTRY RESPONSIVE SCHOOL CURRICULUM**

As the ME Program matured, RDA Hunter in consultation with industry partners and with Maitland-Grossmann High School, developed **iSTEM** (integrated STEM); a new Board of Studies approved curriculum.

iSTEM is a student-centred subject for students in Years 9 and 10 that delivers knowledge in Science, Technology, Engineering and Mathematics (STEM) in an integrated way.

Incorporating mechatronics, aerodynamics, engineering, 3D CAD/CAM, aerospace and motion modules, iSTEM presents maths, sciences engineering and technology to students in ways that challenge their understanding of these subjects and develops their ability to manage projects and work in teams. iSTEM was created in the Hunter region in direct response to industry's urgent demand for STEM qualified young people.

BAE Systems, Ampcontrol and Varley Group are among 50 ME Program industry partners who were integral to the formation and implementation of the iSTEM syllabus.

## **FEMALE PARTICIPATION IN STEM**

RDA Hunter has managed all-female STEM activities to promote female participation. In 2018, there are 14 *All Girls* schools endorsed for iSTEM in NSW which demonstrates female engagement in STEM based activities.

Female STEM engagement programs managed by RDA Hunter:

- SheFlies Summer Camp for an all-girls cohort (60 students);
- ME Program / University of Wollongong travelling STEM roadshow for two all-girls cohorts (300 students);
- STEM Ex opportunities provided to 50% females – RDA Hunter managed work experience opportunities with Defence industry partners.
- MiniME activities provided to whole-of-class primary school age students.

Evidence of the ME Program benefits in promoting the uptake of STEM subjects in **Year 11 and 12** is included in **Appendix**. The longitudinal data also show significant improvement in STEM subject uptake at ME Program schools in the Hunter.

Subject participation and retention rates have increased from below state averages to above the state-wide trend over the period.

The Board of RDA Hunter welcomes opportunities to explore mechanisms that will see more of New South Wales, especially other defence regions, experience the benefits of productive industry-school partnerships and a growing pool of people equipped with STEM knowledge and skills.

Given ownership of the ME Program rests with RDA Hunter, and the importance of our contractual relationship with the Department of Defence with respect to this program, it is recommended that the Board of RDA Hunter be consulted directly regarding “its roll out across the state”.

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## Appendix: ME PROGRAM SUPPORTS STEM SUBJECT RETENTION RATES

### Hunter Group1 schools – Year 12 STEM compared with State average

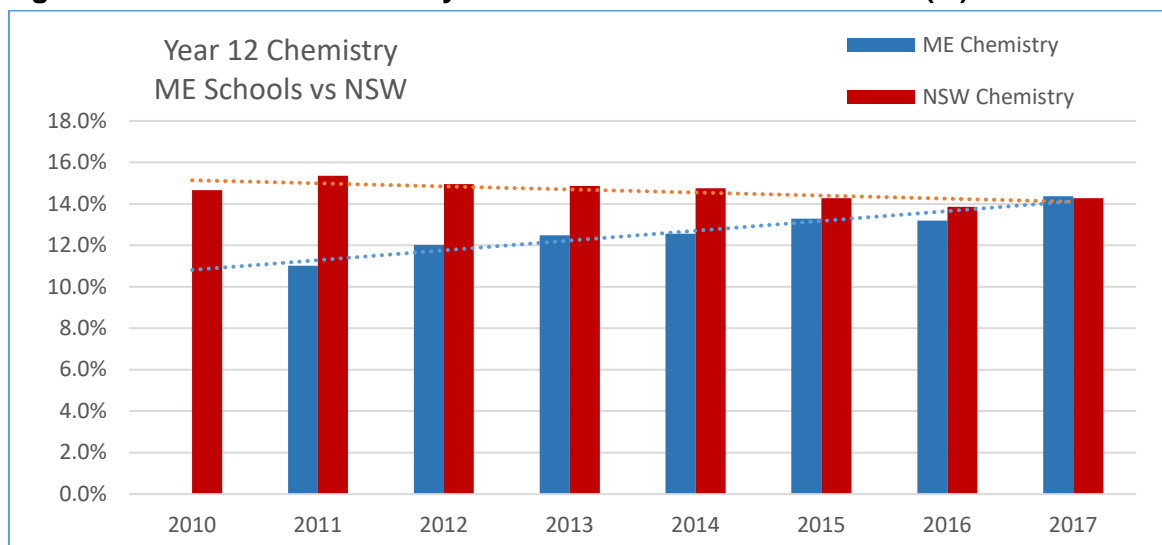
Due to the maturity of the ME Program in the Hunter region, a data study has been conducted on **Year 12** enrolments in schools that have shown consistently high engagement with the ME Program since 2011. These “Group 1” schools represent the three school sectors (DET, Catholic and Independent) and have a typical yearly total cohort of approximately 1200 students.

This new data is significant as it illustrates whether these Group 1 students making STEM subject choices over 2011 – 2017 are ***maintaining their interest and staying in the subject*** in Year 12.

Dropping difficult STEM subjects such as Physics or Software design in Year 12 may have been expected, but the data generally show ME Program Group 1 school students are sticking with their choices significantly better than the NSW average.

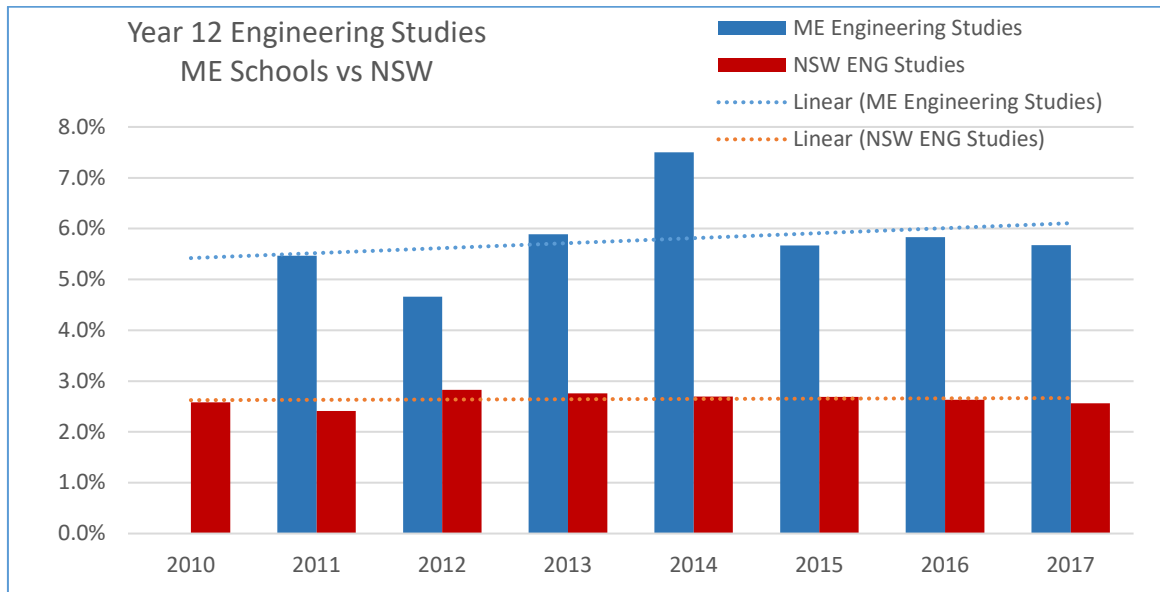
The subject examples of Chemistry, Engineering Studies, Mathematics Extension 1 and Software Design and Development have been monitored and outcomes analysed.

**Figure1: 2017 Year 12 Chemistry enrolments ME Schools vs NSW (%)**



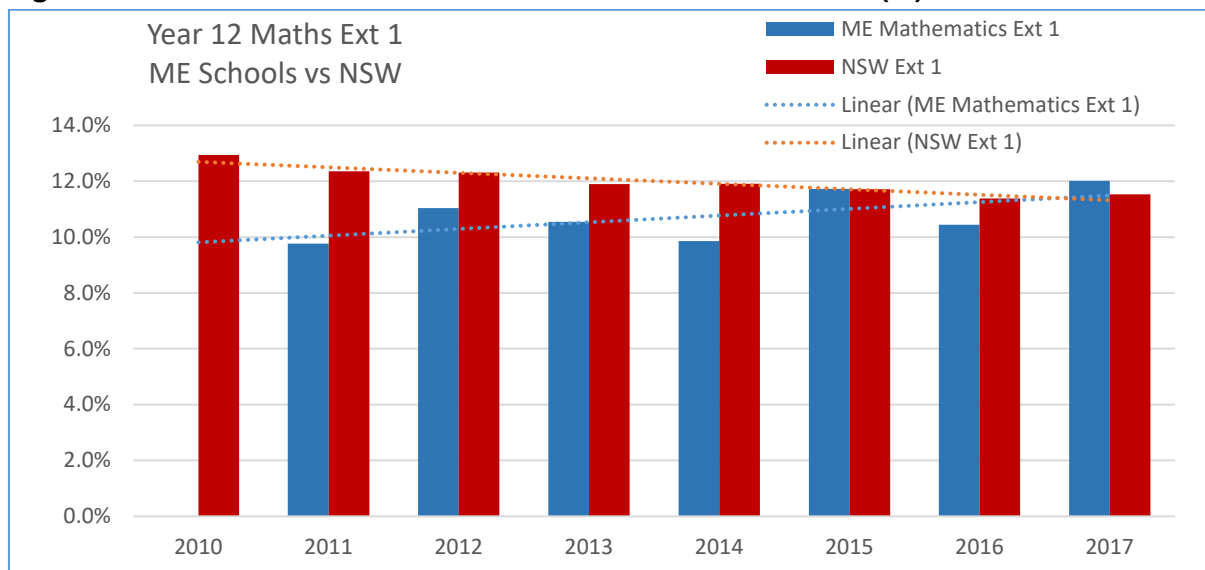
Year 12 enrolment data repeats this trend - ME Program Group 1 schools increasing significantly while Year 12 NSW enrolments decline.

**Figure 2: 2017 Year 12 Engineering Studies enrolments ME Schools vs NSW (%)**



Year 12 enrolment data repeats this trend - ME Program Group 1 schools increasing while Year 12 NSW enrolments remained flat.

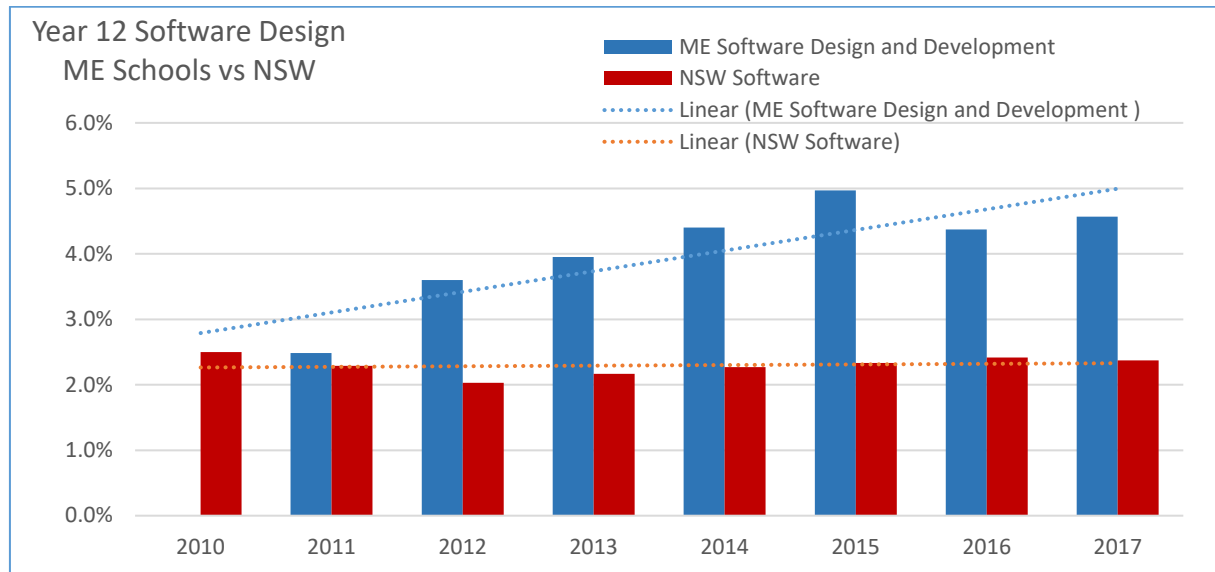
**Figure 3: Year 12 Maths Ext 1 enrolments ME Schools vs NSW (%)**



Year 12 enrolment data repeats this trend - ME Program Group 1 schools increasing while Year 12 NSW enrolments decrease.



**Figure 4: Year 12 Software Design enrolments ME Schools vs NSW (%)**



Year 12 enrolment data repeats this trend with a very large increase (almost 70% increase in trendline) for ME Program Group 1 schools while Year 12 NSW enrolments remain flat.

The above results for Group 1 ME Program schools, covering cohorts of over 1200 students show significant improvements in STEM enrolment are being maintained as students complete their two-year HSC study. The initial Year 11 STEM subjects chosen by students, which have been encouraged and supported through participation in ME Program initiatives, are maintained over 2 years of study.

– End –