



FACT SHEET

CODING IN SCHOOLS

Coding in Schools

What's the issue?

As our economy responds to technological change, it is vital all Australians are skilled to be able to participate, to secure jobs today and well into the future.

Digital proficiency will be a foundation skill, as important as reading and numeracy. It will increasingly be the determinant of employment prospects and opportunity.

The Australian Workforce Productivity Agency predicts that in 2025 there could be an undersupply of qualifications for key ICT occupations, with employment projected to grow between 64 and 72 per cent faster than overall employment growth, and account for around 5 per cent of all employment in 2025.

Business leaders, industry, demographers and the Chief Scientist are urging for immediate action to prepare for this future demand. Key to this, they say, is to improve digital literacy in schools, and embed coding in the Australian Curriculum from primary school.

Chief Scientist Ian Chubb "If the digital economy is an arena, then the skills you need to play include computer programming and coding. Informatics gives us these skills and this event highlights the global nature and ferocity of the competition."

Australian Computer Society President Brenda Aynsley

"In ten years' time, it will be the most common language in the world. You need to teach a language as early as possible to allow for maximum fluency in a child."

Yet there is concern about whether Australian schools are prepared to respond to this challenge. Around 20,000 teachers in science, maths and IT classes never studied these subjects at university. Australian kids risk missing out.

Over 12 European countries already have computer programming and coding as part of their curriculum and a further 7 are in the process of introducing it. Countries, including New Zealand and Singapore are in the process including coding in the curriculum. Computer programming and coding is already part of the primary curriculum in England, Belgium and Finland, Estonia, the Netherlands, Italy and Greece.

Labor's plan

Labor believes that coding is the literacy of the 21st Century, and every young Australian should be able to read and write the global language of the digital age.

Business and industry have advocated strongly for a greater emphasis on STEM on the basis of their expected future demand for these skills. In a global economy, we need to position kids today, to win the jobs of the future.

Australia needs to elevate technology to the status of literacy and numeracy in the National Curriculum so that it is taught from the beginning of formal learning by a more coding-literate teaching workforce.

A Labor Government will ensure that computer programming and digital technologies - coding - is taught in every primary and secondary Australian school, by a teacher who has had the opportunity to receive training in coding.

1. Coding: Literacy of the 21st Century

A Labor Government will work with the states and territories, teaching bodies, school systems

and the Australian Curriculum and Reporting Authority (ACARA) to examine ways to lift the status of coding to a core skill that is part of learning from the start of schooling.

Labor's plan is that by 2020 computer programming and digital technologies - coding - is taught in every primary and secondary Australian school.

2. Centre for Excellence

Labor will invest \$9 million over the forward estimates to establish a National Coding in Schools centre (NCIS) so that all teachers in Australia have the opportunity to develop their skills, and every student can have access to exciting ways to learn coding.

NCIS will collaborate and link with industry and experts to develop the materials and content to support coding in schools.

To ensure teachers and students benefit from cutting edge virtual programs that set students up for success at school and in the workplace NCIS will:

- Develop and promote innovative teaching of coding in our schools; ensuring teachers in every school can access to practical hands on training in coding and its integration into the classroom;
- Partner with business and industry leaders to connect the teaching of coding in schools to help establish a culture of innovation and creativity while equipping students with the skills that will be in-demand in the future, including hands-on experience; and
- Provide ongoing engagement with teachers across the country, to support the integration of coding into their teaching with confidence.

Case Study

Intel Galileo Project

Intel Australia has partnered with 30 schools, education departments and the CSIRO to pilot a program where Intel Galileo development boards (D.I.Y technology board) are used by primary and secondary school teachers and students. Essentially, Galileo boards give students the ability to add interactivity and intelligence to everyday objects.

Left in the hands of students and their pioneering teachers, these boards are being used to create fantastic projects and solve problems in creative and innovative ways.

For instance, primary school students designed and built automated bins that ward off pesky cockatoos in the school yard - a problem they were able to solve using Galileo technology.

The purpose of the pilot is to build up resources for teachers, develop a core community of capable teachers that can teach other teachers, and design appropriate teacher professional development courses.

Code.org

Established in 2013, Code.org is a United States based not-for-profit organisation working to make computer science available in more schools, and to increase the number of women learning coding and programming skills. Teaching and learning resources are available for free in more than 30 languages and are used in over 180 countries.

Code.org's Hour of Code - which challenges students to take the first step in computer programming - has been a huge success, with over 115 million participants.

Teach STEM

What's the problem?

A future STEM workforce starts in our classrooms today.

Experts predict that 75 per cent of the fastest growing occupations will require skills in science, technology, engineering or mathematics.

But we know that unless students are interested and engaged in STEM at an early age, they are unlikely to pursue a career in those fields.

Currently this isn't the case, with more children dropping out of STEM studies with every additional year of study. This is in part a reflection of way that STEM is taught, but also that our teachers aren't properly supported in engaging with young peoples' natural curiosity.

This is now an urgent issue that requires immediate action.

Nationally, around 60 per cent of IT teachers and 40 per cent of General Science and maths teachers teaching Years 7-10 classes do not have a tertiary qualification in those areas.

We need to do more to support Australia's great teachers so that they can deliver STEM courses in a way that will inspire and engage young Australians.

Targeted investment across the education system to improve skills, increase participation, drive creativity and innovation, and uplift our competitiveness is vital to empowering our most important resources: the creativity and genius of the Australian people.

Labor's plan

Labor will deliver a two part plan to upskill teachers as an urgent priority, and create a pipeline of future STEM qualified teachers to join the teaching ranks.

1. STEM Upskilling Teachers

Labor will establish a five year STEM teacher training fund that will support 5,000 primary and secondary teachers per year to undertake professional development in STEM disciplines. Coding and programming will be a key focus of this program.

The training fund will ensure the upskilling of around 25,000 existing STEM teachers in primary and secondary education, with these teachers taking their new skills straight to the classroom.

These grants will back our teachers to do what they do best, with the skills and training they need.

The grants will be flexible, and will allow teachers to work with their schools in determining the best form of professional development.

Labor will work with teaching bodies, TAFEs and State Governments to develop criteria around access to the scheme and the eligible courses and uses of the grants.

The program would have a fiscal impact of \$127 million over the forward estimates and commence from 2017 school year.

2. Teach STEM

Labor will provide 25,000 teaching scholarships over 5 years to new and recent graduates of STEM degrees to encourage them to continue their study and become a STEM teacher.

A STEM degree is the best background for STEM teachers in our schools, to be able to connect with young Australians and engage them in their studies. When a student graduates from a STEM course – be it IT or science – they can consider either continuing to study or entering the workforce.

Teach STEM will provide an incentive payment to attract more STEM graduates to become teachers. Students that have just completed a STEM degree, or graduated within 5 years, will be able apply for the incentive payments. The payment of \$15,000 is structured so that \$5,000 is paid upon commencement of the course of study, with the remaining paid after their first year in the classroom.

This initiative will increase the attractiveness of STEM teaching careers and boost the number of qualified STEM teachers in Australian classrooms.

Labor will work with universities and teaching bodies, TAFEs and State Governments to develop criteria around access to the incentive payments.

This initiative has a \$133 million financial impact over the forward estimates.

STEM Teachers are vital

Chief Scientist Ian Chubb recommends we “lift the number of qualified STEM teachers by increasing the attractiveness of STEM teaching careers, including the promotion, remuneration and support available to teachers”, and “creating incentives for high-achieving STEM students to enrol in teacher training.”



Authorised by G. Wright, Australian Labor Party,
5/9 Sydney Ave, Barton ACT 2600.