The Influences, Purpose and Implications of the National Assessment Program for Information and Communication Technologies (NAP - ICT) to Education in Australia

By Joyce Sendeckyj

In 2008, The National Assessment Program (NAP) was established in its current form to become the instrument of the Australian Curriculum Assessment and Reporting Authority (ACARA) to specifically assess and measure student outcomes within Australia's education system and report the results to all Australian stakeholders including "governments, educational authorities, schools and the community" (National Assessment Program, 2013). ACARA's direction comes from The Education Council (EC) itself established by the Council of Australian Governments (COAG) in 2013 to oversee the three primary educational responsibilities of curriculum, assessment and reporting for Australian schools. The current driving force for a national approach to the assessment of educational goals for Australian students is the *Melbourne Declaration on Educational Goals for Young Australians*, (*Melbourne Declaration*), established by the Commonwealth Ministers of Education in 2008. The two key overarching goals of the Melbourne Declaration are that "Australian schooling promotes equity and excellence [and that] all young Australians become successful learners, confident and creative individuals, and active and informed citizens" (Melbourne Declaration, 2008).

To measure the success in meeting these goals, ACARA has established three National Assessment Programs; Numeracy and Literacy (NAPLAN), Science Literacy (NAP – SCI) and Information and Communication Technology (NAP – ICT). All National Assessment Programs, including the NAP – ICT are developed and delivered by the Australian Council for Educational Research (ACER). NAP-ICT is conducted in three-year intervals, assessing students in years 6 and 10 only. NAP – ICT is not compulsory and covers a cross-section of all school systems (private and public), economies and locations (remote, urban and metropolitan). The latest assessment was conducted in 2014, with the results due in May 2015. The NAP-ICT results are published on the NAP website, however schools are not identified and their results do not appear on the My School (2013) website along side the NAPLAN results.

The NAP – ICT concentrates on literacy assessments in Information and Communication Technologies (ICT) and assesses students on their "ability to appropriately access, manage, integrate and evaluate information, develop new understandings and communicate with others in order to participate effectively in society" (NAP, 2013). The Melbourne Declaration further sets the following specific ICT goals requiring students to be "creative and productive users of technology, especially ICT, as a foundation for success in all learning areas" (2008). This paper will discuss if the instrument of the NAP – ICT is furthering these goals and if it is providing students with the acquisition of advantageous ICT skills is preparing them to become productive citizens in the 21st century, as affirmed by *The Melbourne Declaration* which states that:

> *Rapid and continuing advances in information and communication technologies (ICT) are changing the ways people share, use, develop and process information and technology. In this digital age, young people need to be highly skilled in the use of ICT. While schools already employ these technologies in learning, there is a need to increase their effectiveness significantly over the next decade* (2008).

This discussion will naturally flow on to the implications that the NAP – ICT will have on schools as well as the level of impact it can be seen to be making on teachers, students and the development of future pedagogy. To better understand and discuss the development of, and issues surrounding the NAP – ICT, it is necessary to provide the background relating the meteoric progress of electronic and digital technologies as information and communication mediums. It is also necessary to recognise the key bodies that monitor global educational, humanitarian, economic and technological developments that in turn inform the Australian Government's educational policy and practice including ICT education, (See Appendix 1).

Global and national influences on Australian ICT education

Technology and a changed society

Today, 85 percent of the world's population has access to mobile communications . . .

While the Industrial Revolution of the late nineteenth century increased economic development and communications through faster transportation and manufacturing systems, the latter half of the twentieth century heralded the Internet and the global phenomenon of the World Wide Web (WWW). These advances in digital communications heralded an unprecedented flow of information between people at unprecedented speeds – as the IT periodical M2PResswire reported in 2012, "it took 100 years to connect 1 billion places and 25 years to connect 5 billion people. Today, 85 percent of the world's population has access to mobile communications, and by 2020 we expect there to be 50 billion connected devices". The significant speed with which individuals and communities have the ability to connect, communicate and transfer information has irrevocably changed the Modus Operandi of society and the workplace as Purani and Nair (2007) attested: "technology and social change are interdependent. The information technology (IT) revolution has redefined social equation shifting the focus from material to knowledge power".

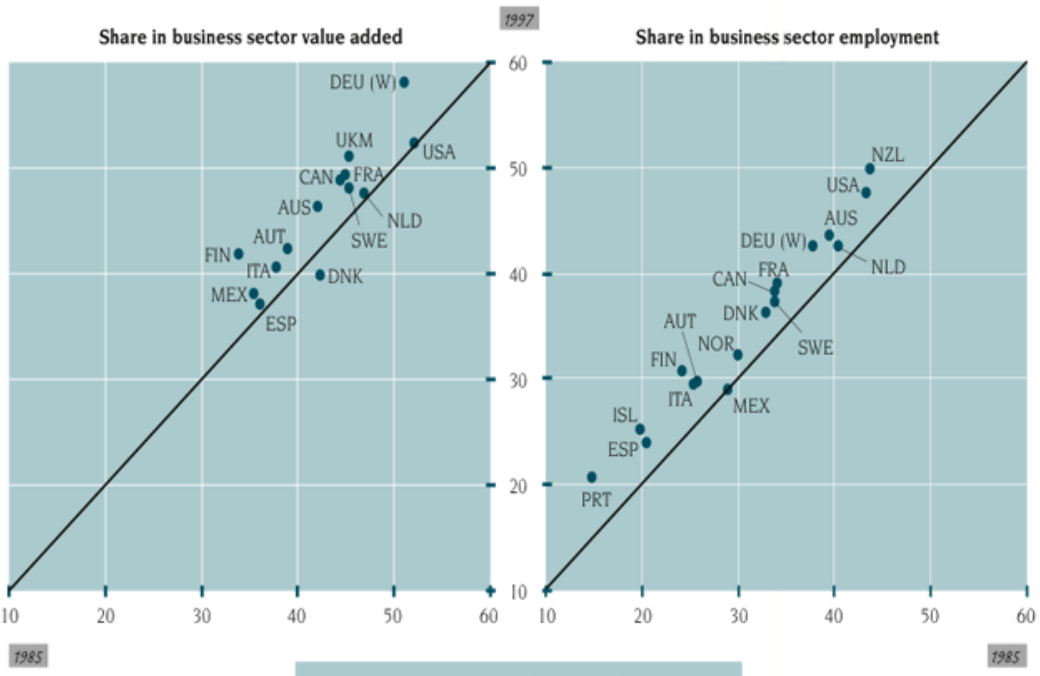
Current secondary students have been born into a generation that is experiencing what Fang, (1997) describes as the sixth global "mass communication revolution . . . profound changes involving new means of communication that permanently affect entire

societies, changes that have shaken political structures and influenced economic development". The emphasis rapidly changed from an economy that was based on 'making' and commerce to one of 'knowing' and using the accessibility of information as a commodity. Peak global bodies such as the Organisation for Economic Co-operation and Development (OECD) responded to these rapid changes in society, realizing the world's economy was becoming increasingly reliant on acquiring knowledge and producing information through the use of new technologies and that this needed to be reflected in our education systems:

> *. . . from a labour market perspective, there is also an increased attention given to specific competencies such as the ability to use information and communication technologies, to solve problems, to work in teams, to supervise and lead and to undertake continuous learning. . . . such an understanding is important for reforming curricula, developing appropriate assessments and providing the kinds of incentives most likely to promote the development of needed competencies* (OECD, 2001).

The table below, *The increasing importance of knowledge-based industries between 1985 and 1997*, OECD (2000), reflects the rise of employment in knowledge-based industries.

Figure 4.1 Increasing importance of knowledge-based industries, 1985 and 1997



Countries above the diagonal are those for which knowledge-based industries' share of value-added or employment was greater in 1997 than in 1985.

Source: OECD (2000), *Science, Technology and Industry Outlook*.

Data for Figure 4.1, p. 150.

The Joint Research Centre (JRC) is the European Commission's (EC) own research service and provides the European Union's (EU) policies with technological and scientific 'evidence-based research' to ensure a sustainable future for EU members (European Commission, 2015). In their collaboration and work with international educational and research organisations, the JRC has also identified new skills required for the workforce of the future, "creativity, entrepreneurship, learning-to-learn, digital competence, eSkills and other 21st century skills and competences are emerging as more and more important for innovation, growth and participation in a digital society and economy" (European Commission, 2014).

Australian perspectives

The discussion and research into the skills and attributes necessary to engage in a knowledge driven economy is continuing within Australian government and industry sectors with the acquisition of ICT skills high on their agendas. The Australian Workforce and Productivity Agency, (AWPA) in their *Information and Communications Technology Workforce Study* (2013), acknowledges that ICT is a key factor in business and workplace innovation and productivity, however, in reality the industry and business sectors are reporting that new graduates of ICT courses are not making the grade, tracking the problem back to schools, "low engagement in ICT skills in schools leads to a less than satisfactory pipeline of ICT skills . . . reform is required to boost perceptions of ICT careers, enhance the work readiness of ICT graduates and improve industry engagement in up-skilling and professional development in an industry characterised by rapidly changing skill sets" (AWPA, 2013).

The AWPA report was also recently quoted by Greg Miller (2014), CEO of the IT solutions company SAP ANZ (SAP stands for Systems, Applications and Products), in an Australian Broadcasting Commission (ABC) technology article. Miller raised serious concerns that Australian businesses were ignoring new trends in ICTs such as social networking and cloud computing at the peril of their existence. Miller further adds "we're simply not developing the right domestic ICT skills to meet the booming demand, raising serious concerns for the future of technology innovation in Australia and the skills of our future generation . . . to stay competitive as a country, fostering IT talent in Australia isn't an option, it's an imperative" (2014). The ABC's Elizabeth Jackson reported on AM in April 2013 that:

. . . assessment in ICT knowledge and skills at the school level is increasingly important to prepare our young people to be work ready.

> *Australia's IT sector has warned that the industry has reached a crisis point because of a desperate lack of skilled workers... they're warning that without more IT workers, Australia will lose valuable business opportunities to innovators overseas* (Australian Broadcasting Commission, 2013).

In the same interview, the then Skills Minister, Sharon Bird, had more questions than answers:

> *Where are the emerging skill opportunities? Are we positioned to match them, both in terms of training at the VET (vocational education and training) level and also at the higher education level? And how can we make sure that people in Australia have the opportunities that emerge from those new models of business that will emerge as well?* (Australian Broadcasting Commission, 2013).

The Australian Industry Group (AIG) in its report, *National CEO Survey. Ready or Not? Technology and Productivity in Australian Businesses* (2013), cites no lack of adoption by Australian Businesses with innovative new technologies, however Australia lags behind in the workforce skills to engage in these technologies and thus slows productivity and performance of business and industry. The AIG:

> *recommends significant new policy initiatives, including development of a national workforce skills strategy for the digital economy; a standing taskforce of industry and government representatives to help drive Australia's digital productivity; and new initiatives to increase collaboration between businesses and research institutions* (AIG, 2013).

It is becoming clear from these reports that assessment in ICT knowledge and skills at the school level is increasingly important to prepare our young people to be work ready.

The OECD and the Program for International Student Assessment

Since 2000 the OECD has conducted the triennial Program for International Student Assessment (PISA) amongst the 34 OECD member countries including Australia, the most recent being in 2012. The purpose of PISA testing and data generation is twofold – firstly, to supply data that gauges students' acquired skills and their preparedness to become productive members of society and secondly to provide benchmarks against which countries and their governing educational bodies can assess and improve future-directed educational systems and outcomes for their students. The PISA testing instruments test only 15-year-old student cohorts in key knowledge areas of mathematics, reading and science (tested in 2012 and 2015), and especially their ability to use the information in these areas to creatively solve complex problems and "to extrapolate from what they have learned and apply that knowledge in unfamiliar settings, both inside and outside school" (OECD, 2015).

Australia has participated in PISA testing since 2000 and the results are an important factor that informs the Australian Government's educational outlook and policies and also informs the National Assessment Program (NAP), allowing for "nationally comparable reporting of student outcomes against the *Melbourne Declaration on Educational Goals for Young Australians*" (Thompson, De Bortoli & Buckley, 2012). Although PISA does not specifically test the use of ICTs, the 2012 PISA test included an optional questionnaire regarding the participants' familiarity with ICTs and the 2015 test will include assessing students' abilities in "collaborative problem solving" (OECD, 2015).

UNESCO and education in Information Literacy

The United Nations Educational, Scientific and Cultural Organisation (UNESCO) believes:

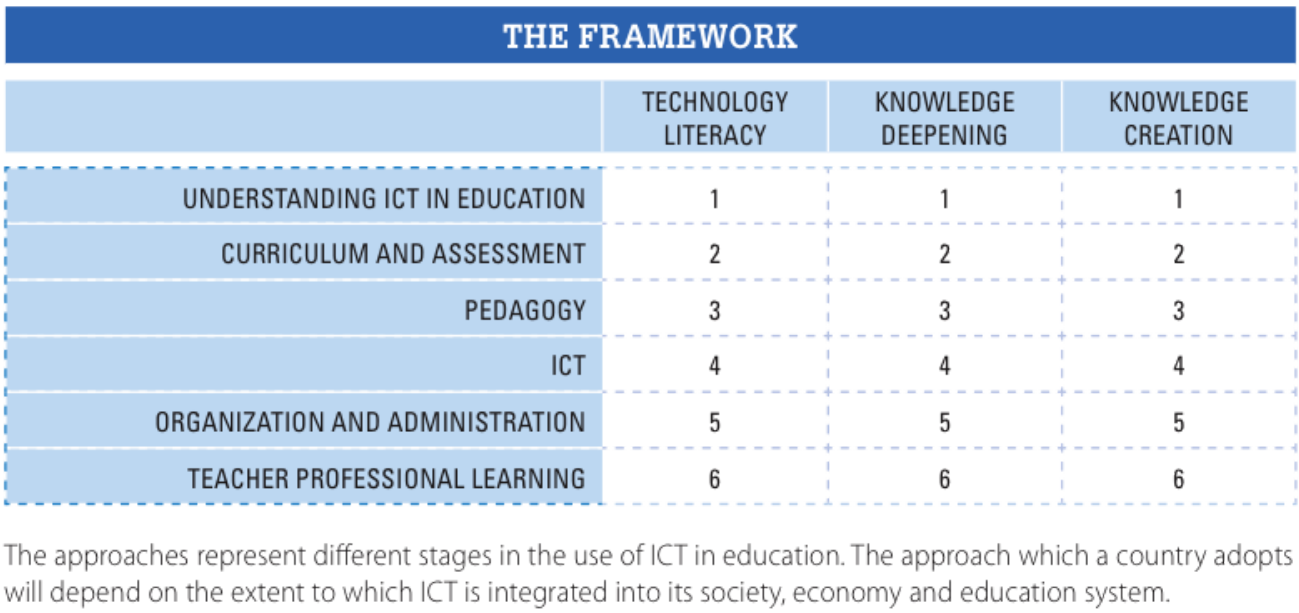
> *that education plays a fundamental role in human, social and economic development . . . with education as one of its principal activities to achieve this aim. UNESCO works with governments . . . to make education systems more effective through policy change* (UNESCO, 2014).

As one of the 195 member states, Australia looks to UNESCO's major focus document of *Education for the 21st Century* as it "tracks education trends and raises the profile of educational needs on global development agendas" (UNESCO, 2014). UNESCO recognises that information literacy, encompassing ICTs and other related media literacies is a key to life-long learning in the age of digital technology and underpins the world economy in the future. In 2005, UNESCO released the *Alexandria Proclamation on Information Literacy and Life-long Learning* proclaiming "Information literacy empowers people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals" (UNESCO, 2005). The Proclamation urges governments to incorporate information literacy as priorities in their educational policies as well as include "professional development of personnel in education" (UNESCO, 2005). In 2011 UNESCO published the *UNESCO Education Strategy 2014-2021*, with key strategies for life-long quality and productive learning, and to recognise that "The growing importance of the knowledge economy has profound implications for the role of education as a determinant of economic growth" (UNESCO, 2014).

More specifically responding to the necessity for pedagogy to respond to emerging technologies, UNESCO, released its *UNESCO ICT Competency Framework for Teachers (ICT-CFT)*, in 2011. This document is presented as a 'Master Plan' to increase the effectiveness of teaching and learning with the rapidly changing landscapes of information and communication technologies and "requires education to re-think what skills and competencies students need to become active citizens and members of the workforce in a knowledge society" (UNESCO, 2011).

The main components of this competency master plan (as seen in Figure 1, below) are based on three developmental approaches to ICT: 'technology literacy', 'knowledge deepening' and 'knowledge creation' and that teachers apply these three key elements across six key facets of their work:

- Understanding ICT in Education
- Curriculum and Assessment
- Pedagogy
- ICT
- Organisation and Administration
- Teacher Professional Learning (UNESCO, 2011).



THE FRAMEWORK

	TECHNOLOGY LITERACY	KNOWLEDGE DEEPENING	KNOWLEDGE CREATION
UNDERSTANDING ICT IN EDUCATION	1	1	1
CURRICULUM AND ASSESSMENT	2	2	2
PEDAGOGY	3	3	3
ICT	4	4	4
ORGANIZATION AND ADMINISTRATION	5	5	5
TEACHER PROFESSIONAL LEARNING	6	6	6

The approaches represent different stages in the use of ICT in education. The approach which a country adopts will depend on the extent to which ICT is integrated into its society, economy and education system.

Figure 1.

. . . no on-going evidence that the imperatives of this UNESCO document are being given prominence in secondary schools . . .

Realistically, this author can observe no on-going evidence that the imperatives of this UNESCO document are being given prominence in secondary schools as professional development for teachers; however, if these directives were to be implemented and then correlated with the results of the NAP – ICT for students (the latest results from the NAP – ICT 2014 will be reported in MAY, 2015), a valuable source of evidence would become available to strengthen the integration of ICT into productive learning outcomes. Note that to date, only the 2011 NAP – ICT results are available and will be discussed in the NAP – ICT section below.

New Media Consortium and The Horizon Report K-12, 2014

Key global bodies such as OECD and UNESCO are concerned with the betterment of mankind through the promotion of peaceful, just, educated and productive societies, and while their work concentrates on education and assessment of learning and teaching methods that consider technological developments, the New Media Consortium (NMC) and its publication *The Horizon Report K-12, 2014 Report*, is increasingly consulted to look for trends in emerging technologies that are expected to directly impact on education:

> *In the NMC Horizon Project, educational technology is defined in a broad sense as tools and resources that are used to improve teaching, learning, and creative inquiry. While many of the technologies considered were not developed for the sole purpose of education, they have clear applications in the field* (NMC, 2014).

Although the NMC was established in 1993 by companies that had vested interests in hardware and software development, it has grown to include their suite of annual *Horizon Reports* compiled by researchers in ICTs and leading educationalists that together discuss how ICTs will challenge and change society into the future and consequently develop teaching practices that will respond to these changes. More than ever *The Horizon Report K-12, 2014 Report*, emphasises that students will require skills in 'creative enquiry' and to be learning in 'ICT-enabled learning settings'. This latest *Horizon Report* included input from Australian researchers from Charles Sturt University's Educational Faculty and the Australian Council for Educational Research (ACER). Interestingly, ACER develops and implements the National Assessment Program, including NAP-ICT. Table 1, below, sets out the *Horizon Report*'s (2014)

"emerging technologies likely to have a large impact over the coming five years in every sector of education". Consequently, there is a need to discuss whether a NAP – ICT every three years is enough to adequately assess if pedagogy in secondary education will be ready to embrace these developments.

Emerging Technology	Time–to–Adoption Horizon
Bring Your Own Device (BYOD)	One Year or Less
Cloud Computing	One Year or Less
Games and Gamification	Two to Three Years
Learning Analytics	Two to Three Years
The internet of Things	Four to Five Years
Wearable Technology	Four to Five Years

Table 1

The National Assessment Program – Information and Communication Technology

Scope

The NAP – ICT is administered and assessed every three years, the latest testing occurring in 2014; however, as the results and reports are not yet available for the 2014 assessment program, this paper will concentrate on the implementation and results for the 2011 program. The 2011 assessment survey represented a "sample of 11,023 students from years 6 and 10, 5,710 from year 6 and 5,313 from year 10. These students were sampled randomly from 649 schools" (ACARA, 2011). Considering that the Australian Bureau of Statistics (ABS) reported that the total number of school students in Australia in 2011 was 3,541,809 (ABS, 2013), this cohort tested is a relatively small sector of Australian students, a mere 3.2% of the total combined primary and secondary school students in 2011, a statistic that consequently needs to be taken into consideration when reviewing the results, along with the fact that results are only collated every three years, unlike the NAPLAN tests that give annual assessment and progress data of Australian students in literacy and numeracy in years 3, 5, 7 and 9. Having considered the aforementioned global trends and outlooks that convey an urgency to address a future workforce that is demanding proficiency of ICTs, it seems imperative that current education practices should rely on data from the NAP – ICT on an annual basis.

ICT Literacy Domain

NAP-ICT testing encompasses a pre-defined 'ICT Literacy Assessment Domain' (ACARA, Exemplars, 2011) including the ability to:

- Access Information: finding and retrieving
- Manage information: organising, storing and retrieval
- Evaluate Information: reflect, judge integrity, relevance, usefulness
- Develop New Understandings: synthesise, adapt, apply, design, invent and/or author
- Communicate with others: exchange and share information; make products to suit context
- Use ICT appropriately: make strategic ICT decisions; consider social, legal and ethical issues.

Three additional strands pertain to "the context in which the ICT literacy processes can be demonstrated" (ACARA, Exemplars, 2011):

- Strand A: Working with information
- Strand B: Creating and sharing information
- Strand C: Using ICT responsibly

Dibdin in 2006, on the eve of the inaugural NAP-ICT in 2005, considered that the "benefit of integrating ICT literacy domain processes and strands is that they cover all bases", adding that in modern society literacy itself is a complicated process, and points out that the technological savvy student may not necessarily be exceptionally literate and, vice-versa, the student with little access to the internet at home "may take longer to negotiate the technology, but may have higher literacy [and communication] skills" (Dibdin in 2006). The literacy domains and strands can then be considered in tandem with the specific modules incorporating ICT skills that were tested in the 2011 NAP – ICT (see Table 2), we can assess if trends are emerging that can inform and positively develop future educational practice to combine "the interaction of information literacy with computer technology . . . regarded as a broad set of generalisable and transferable capabilities that are used to manage and communicate cross-disciplinary information using computer technology" (ACARA, 2012). NAP – ICT 2011 involved testing students in seven specific modules, summarised in table 2.

1	**School Picnic:** plan a school sports picnic	➢ Blog ➢ Search Engine ➢ Graphics Software	Use blog and websites to identify sports equipment and venue to meet criteria. Use graphics software to produce invitations.

		➢ Mapping Software	Use mapping software to embed map to venue.
2	**Friend's PC:** Help a friend to manage software on a PC.	➢ Photo management software ➢ Anti-virus software ➢ Photo collection and photo editing software	Search for and install photo management software. Change settings for anti-virus software. Organise and edit photo collection.
3	**Saving Electricity**: school project to raise awareness about saving electricity.	➢ Specific web research resources ➢ Video editing software	Research topic with targeted web resources. Create original awareness video using video editing software using text and effects.
4	**Wiki Builder:** Update the wiki of a local sports club	➢ Wiki application ➢ Email application	Receive content by emails and edit the wiki. Edit and format existing information. Add new information and functions to the wiki.
5 (Year 10 only)	**Language Preservation:** national project to preserve Indigenous Australian languages	➢ Collaborative workspaces ➢ Collaborative scheduling	Collect and edit information in collaborative workspace. Schedule meetings with other students in collaborative workspace.
6 (Year 10 only)	**Art Show:** manage section of school's website to promote school's art show.	➢ Website editing (html/xhtml) ➢ Camera and photo managing software ➢ Webmail communication	Add and edit content on specific school website space (pages) for art show. Download and mange images from camera. Mange communication through email account.
7	**General Skills Module**	➢ Word processing software ➢ Spreadsheet processing software	Complete 'everyday' short tasks using word processing and spreadsheet software. **NB** not project based tasks. General questions on computer use.

Table 2

Three of the above modules were 'trend' modules that were used in 2005 and 2008 and four modules were newly developed for the 2011 assessment. The new modules included content that required the use of technology such as video and webpage editing, collaborative workspaces to reflect more recent developments in ICT (ACARA, 2011). Six out of the seven modules were project-based, requiring students to assess the given problem criteria, utilise specific ICTs and come up with solutions or completed projects; working towards the students becoming "creative and productive users of technology" as cited by *The Melbourne Declaration* (2008). The testing modules also promote the more recent tenets of NAP by learning to "appropriately assess, mange, integrate and evaluate information, develop new understandings and communicate with others" (2013). In 2005, two key methods of assessing NAP-ICT results were established, firstly a scale to test ICT Literacy using a 'mean scale score' and also a matrix comprising six proficiency levels that were overlaid at six equally spaced intervals across the ICT Literacy scale. For the purpose of reporting key student trends in levels of ICT and information literacy this paper will use the six proficiency levels as seen in Figure ES.2 (below), *Distribution across Proficiency Levels for Year 6 and 10 Students from 2005 to 2011*.

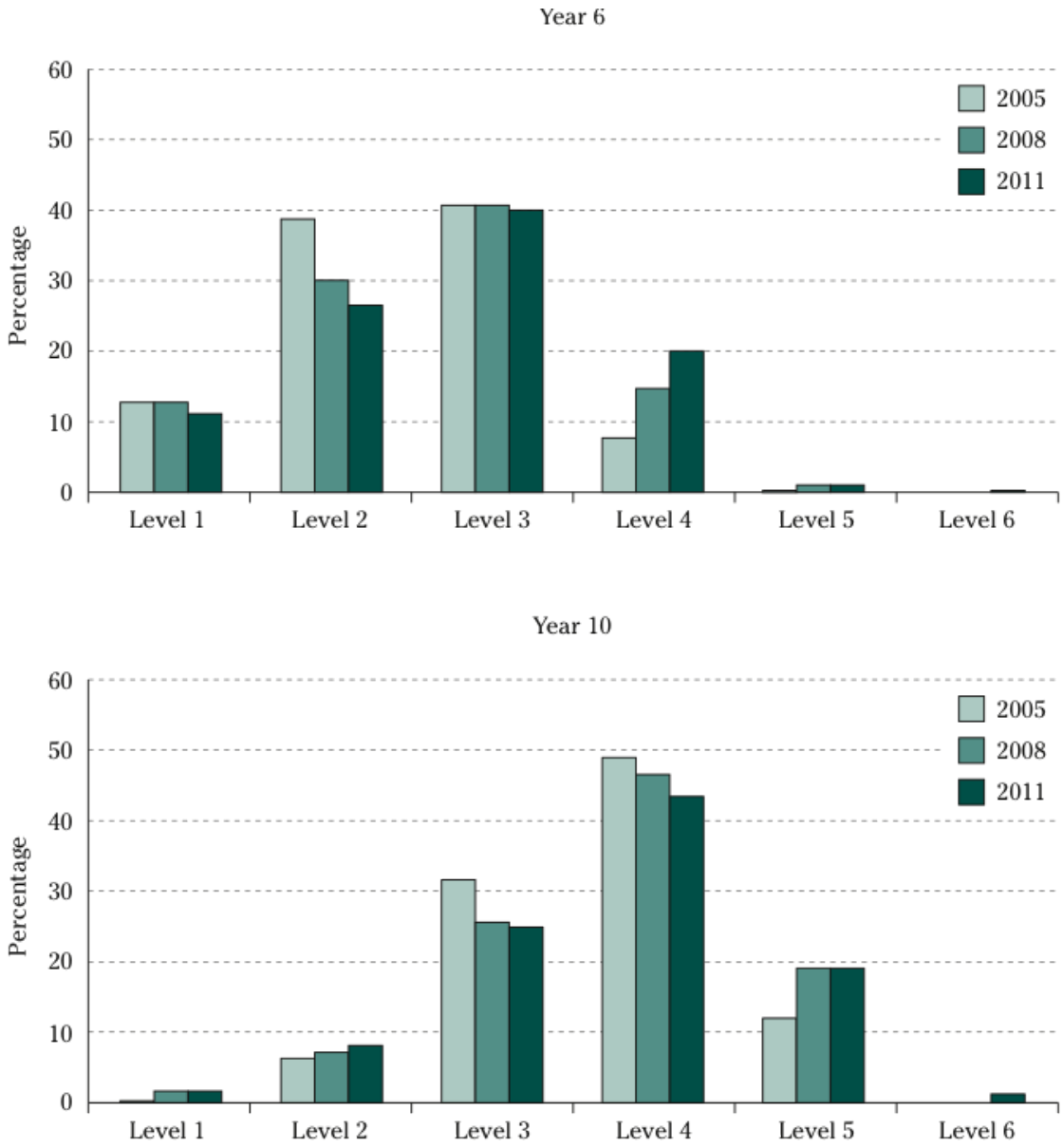


Figure ES.2 Distributions across Proficiency Levels for Year 6 and 10 Students from 2005 to 2011

NB: Figure ES.2 above is referenced from Australian Curriculum Assessment and Reporting Authority, (2012). *National Assessment Program – ICT Literacy Years 6-10 Report 2011*.

The key information shown by these graphs is that the Year 6 students who reached or exceeded the Year 6 Proficiency Standard in 2011 was 62%, compared to 49% in 2005 (and 57% in 2008) which was "statistically significant" (ACARA, 2011). This is in contrast to Year 10 students who made a comparatively unremarkable (and disappointing) increase in reaching or exceeding the Year 10 Proficiency Standard, going from 61% in 2005 to 65% in 2011. A report written in 2010 by ACER'S Deputy Chief Executive Officer, John Ainley, cites that the 2008 Year 10 Proficiency Standard was 66%, which is higher than the 65% recorded in the 2011 assessment; in effect the progress of Year 10 students was sliding backwards. Figure ES.2 also reflects a "relative stability of the percentage of students in the lower proficiency levels" (ACARA, 2011).

These same trends were also reflected by Ainley (2010) as being present in the 2005 assessment indicating "that gains in achievement by Year 6 students (in 2008) did not come as a result of improvement by lower performing students. The gains were recorded at the middle and upper level of proficiency." Ainley (2010) links these results to socioeconomic disadvantage for Australia's indigenous students and a 'socioeconomic' underclass that did not have technology available and whose parents represented 'unskilled' occupations. In his December, 2010 report, Ainley concedes that in the 2008 assessment students displayed an adeptness in the basic elements of technologies; however, he also concluded that they need "more knowledge and skill in applications that involve creating, analysing or transforming information". As the report of 2014 instrument and results for NAP – ICT are not yet available (as from 28 May, 2015), it will be interesting to see if more 'trend' modules were developed and if improvement developed, particularly in the Year 10 results, given these students are on the cusp of their critical VCE years.

Implications for Australian education and its stakeholders

Sir Ken Robinson (2010) believes we are not responding quickly enough to "changing paradigms" in education. By this he means that technology has forever altered how we learn, and the teaching methods including the pedagogy that teachers employ needs to keep pace. Robinson illustrates that we are moving towards a mindset of "divergent thinking, an essential capacity for creativity" (2010). Currently the NAP – ICT encourages students to find a solutions for pre-defined problems or issues; however, in its current form and with a schedule of every three years, it may not be keeping pace with the many changing faces of technology such as assessing how students use technologies interactively or collaboratively.

It is not difficult to see why many teachers may be frustrated in finding a 'comfortable fit' with the incorporation of technology into their teaching due to the complexity of ICTs. According to ACARA (2012), teachers need to differentiate between two aspects of technology – "the key difference between Design and Technologies and Digital Technologies is the relative emphasis on design thinking and computational thinking". The Design and Technologies is largely investigative and requires creativity, innovation, analysis and evaluation to find the best solution. With the appropriate professional development every teacher should able to incorporate ICTs into their teaching to achieve solution-based outcomes. Digital technologies, incorporating algorithms and organising data, will largely be taught by specialist IT teachers. The OECD realised in 2001 that teachers must:

> *become more student-centered and to emphasise active learning . . . they must be in the vanguard of innovation, including the informed, judicious use of ICT . . . the teacher as facilitator; as knowledgeable, expert individual; as networked team participant, oriented to individual needs; engaged both in teaching and in research and development*."

This mantra should be one that underpins an assessment such as NAP – ICT. However currently the scope of NAP – ICT is limited, only claiming to assesses "general ICT skills and knowledge . . . [although] the assessment maintains a 'futures perspective' to ensure that the knowledge and skills assessed keep up with technological advances in ICT, and with the delivery of ICT changes in schools" (National Assessment Program, NAP. 2013). The NAP – ICT may also fall short of the "knowledge deepening' and 'knowledge creation' as suggested by UNESCO in 2011.

The Australian Institute for Teaching and School Leadership (AITSL) documents clear guidelines for teachers to integrate and demonstrate ICT proficiency as part of their *Professional Standards for Teachers* (AITSL, 2014). Table 3 (below) takes examples for graduate teachers as the entry point, and lists two of the standards with graduate level ICT proficiency requirements:

AITSL Standard	**Professional Practice**	**Graduate Level Proficiency**
2.6 Know the content and how to teach it.	Information and Communication Technology (ICT)	Implement teaching strategies for using ICT to expand learning opportunities for students.
3. Plan for and implement effective teaching and learning	3.4 Select and use resources	Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning.

Table 3

One point of contention has been that the AITSL professional standards are "being imposed on the profession, artificially constructing the work of teachers as comprising a set of discrete domains that fail to do justice to their professional practice" (Allard and Doeke, 2014). In reality many beginning teachers may already work at *Proficient* and even *Highly Accomplished* levels when it comes to creatively and innovatively utilising ICTs in their teaching practice and these new and recent graduates represent the teaching profession's 'digital natives'. There are also suggestions that teachers are blindly accepting new technologies, simply because they see them as a 'must do', without purposefully integrating them into their pedagogy as, Selwyn observes, "most people working in the field are so convinced of the benefits of technology in education that they are unwilling to think otherwise" (2011). If NAP – ICT is gathering research data on how well students are solving problems with ICT, and schools are investing in IT infrastructure and software, then teachers need support enabling the effective engaging ICTs for productive learning, as Roddick explicates:

> *. . . if we really want computers to help students to learn better then the second step needs to be the government working with schools to plan how computers can be merged into the complicated environments they have been placed in. We've got the equipment. Now, let's shift focus to the real stuff, learning, and how we can realistically help that happen* (2010).

Summary

From 23 to 25 May 2015, UNESCO held the *ICT in Education: International Conference on ICT and post-2015 Education* with key debates surrounding:

> *how ICT reshapes key aspects of the education system, and how policy enablers and ICT innovations should be intertwined in national and institutional policies in order to underpin the achievement of post-2015 education targets [and] effective pedagogical use of ICT to ensure quality of learning* (UNESCO, 2015).

Clearly there is a sense of growing urgency to formalise professional development and educational policy that firmly integrate ICTs into future pedagogy. Australia's opposition leader, Bill Shorten, in his budget reply to the nation on May, 14, 2015, acknowledged

that our educational system was not keeping pace with the skills needed to make Australia competitive in the fields of scientific, technological, engineering and mathematics and that he wants:

> *more Australians making breakthroughs and adapting technology here in Australia . . . I believe Australia can be the science, start-up and technology capital of our region: attracting the best minds, supporting great institutions and encouraging home our great expats.*

If Australian educational policy (albeit in opposition) is serious in following global leadership and embedding genuine effectiveness of ICTs into Australian curriculum and ensuring the future of our workforce and economy, then it needs to become as serious about the NAP – ICT as it is about NAPLAN. NAP – ICT needs to broaden in scope and depth, be delivered annually and be accompanied by professional development for teachers and, finally, needs to publish its results on the national *My School* website and be accountable to the stakeholders in Australian education and Australia's economic future.

Editor's Note: This paper was written as part of a Masters of Teaching in May of this year, in response to a discussion on educational policy, at Monash University Education Faculty (Gippsland Campus).

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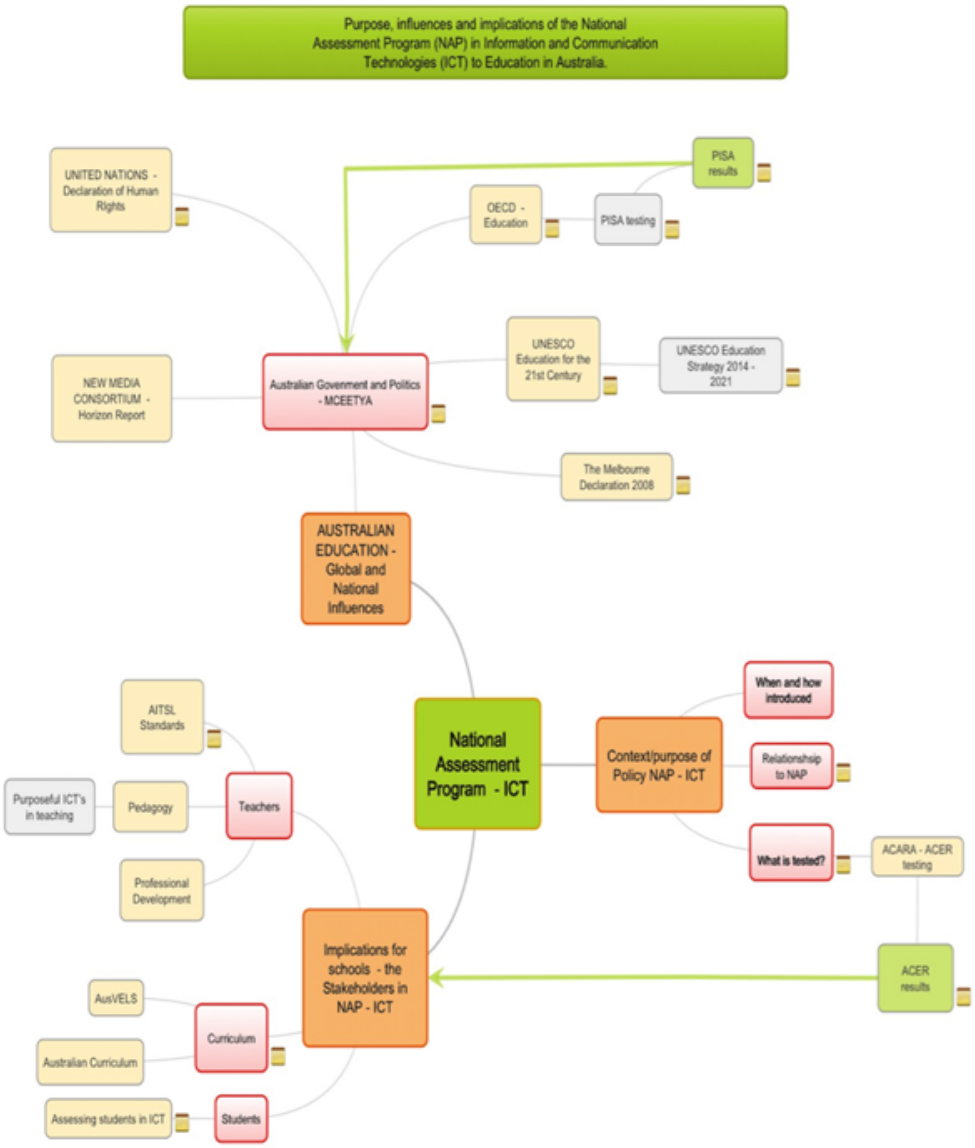
Appendix 1


Purpose, influences and implications of the National Assessment Program (NAP) in Information and Communication Technologies (ICT) to Education in Australia.
UNITED NATIONS - Declaration of Human Rights
PISA results
OECD - Education
PISA testing
NEW MEDIA CONSORTIUM - Horizon Report
Australian Government and Politics - MCEETYA
UNESCO Education for the 21st Century
UNESCO Education Strategy 2014 - 2021
The Melbourne Declaration 2008
AUSTRALIAN EDUCATION - Global and National Influences
National Assessment Program - ICT
When and how introduced
Context/purpose of Policy NAP - ICT
Relationship to NAP
What is tested?
ACARA - ACER testing
ACER results
AITSL Standards
Purposeful ICT's in teaching
Pedagogy
Teachers
Professional Development
Implications for schools - the Stakeholders in NAP - ICT
AusVELS
Curriculum
Australian Curriculum
Assessing students in ICT
Students