1. INTRODUCTION

This document summarises the final report, Good Timing, of the Timeline programme of work, commissioned by the Department for Education, and carried out by the Centre for Education and Industry at the University of Warwick (CEI), the International Centre for Guidance Studies at the University of Derby (iCeGS) and Isinglass Consultancy Ltd. The programme sought to explore the potential to embed STEM careers awareness in the early stages of secondary education. This text in this summary is, for the most part, taken directly from the report.

2. BACKGROUND

In recent years the UK has seen an unprecedented rise in the interest of Government, industry and others in the uptake of STEM subjects in schools and colleges. This has been driven by the need to ensure that young people gain the skills and aspirations essential for building the UK's economy and to help them participate in an increasingly scientific and technological society. The STEM Careers Awareness Timeline Project was commissioned to explore the potential to embed careers activity in STEM subject lessons and extracurricular programmes for pupils at Key Stage 3.

The Timeline Project identified several factors associated with a successful STEM careers school.

- Senior leaders will be committed to STEM and a STEM coordinator will have been appointed, with an appropriate level of authority to take this work forward.
- Teachers in all STEM subjects will be sufficiently well-trained and confident to present STEM careers activity within their teaching and in schemes of work.
- The general careers provision in the school is of high status, led by a capable careers coordinator who is seen as a valued partner by the school STEM community. Recent changes in policy\(^1\) may make it harder to achieve successful STEM careers provision, since schools may choose to scale back their commitment to careers to the minimum statutory requirement.

3. KEY FINDINGS

- STEM activity in schools is complex, in that it cuts across well embedded traditional subject departmental structures.
- Most secondary schools do not have a clear strategy for teaching and learning about engineering, and lack staff with expertise in this area. Where it does occur, learning about engineering is normally restricted to extracurricular activity, reaching only small groups of enthusiasts.
- Successful STEM activity in schools, including STEM careers, is reliant on senior leadership support, which includes committing adequate resources and establishing a STEM coordinator role, with appropriate status.
- Better STEM careers activity arises where subject teachers see the preparation of young people for work as an integral part of their professional role, and where they have the professional skills and confidence to act on this.
- Careers education does not normally have high status in schools and the relationship between careers provision and individual subject departments is often weak or non-existent.
- Schools that have set up STEM working groups involving careers staff, STEM teachers and senior leaders are able to offer a better STEM learning experience for pupils.
- There is a risk that STEM careers support in schools may be scaled down as a consequence of the Government’s Education Bill in which schools will have a statutory duty to ensure that pupils are provided with careers guidance, and which gives schools flexibility over how it is provided.

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\(^1\) See http://media.education.gov.uk/assets/files/pdf/s/school%20communication%20april%202011.pdf
• Teachers often see science as the driver for STEM. Science and mathematics have status as compulsory subjects, and science teachers’ are able to reach out beyond their subjects.

• Attitudes of parents to STEM are a key factor influencing young people’s future qualification and career choices. Cultural factors, parental aspiration and familiarity with STEM subjects, are thought to influence these attitudes.

• Families, peers and subject teachers are the most usual sources of careers information for this age group.

• Some of the most effective STEM activity occurs in more informal learning contexts, though the provision is not uniform across STEM subjects, with significantly more school trips and clubs being science focused. Non-white British pupils are more likely than other groups to participate in informal STEM learning experiences.

• STEM enhancement and enrichment activities are often seen as a mechanism for generating interest in the subjects, but tend not to be valued for careers learning potential.

OTHER FINDINGS

Design and technology, and science were popular subjects among Key Stage 3 pupils surveyed. There was no evidence for a fall in popularity of science at this key stage, though there was a marked reduction of 12 percent over the two years, in the numbers of pupils stating that they ‘enjoyed’ mathematics.

Engineering was seldom taught as a subject or identified in other STEM subjects as a specific discipline. Engineering and technology were perceived to be less important by pupils as they progressed through Key Stage 3, whereas the value of science and mathematics increased.

Pupils at this age were most likely to seek information about careers from their subject teachers and families, though half of year 9 pupils considered the internet to be a good source of information on qualifications and work. STEM enrichment and enhancement activities tended not to focus on careers. Much of this activity took place through extracurricular clubs and school trips, most of which had a science theme. School visits based around mathematics, technology and engineering were less common.

4. RECOMMENDATIONS

The momentum generated in embedding STEM in schools should be maintained. The current economic backdrop means that schools with a robust STEM approach will offer their pupils better future career opportunities.

School senior leaders should offer fully committed and long-term support to STEM careers. This might include: (i) appointing a STEM coordinator with appropriate status; (ii) providing adequate resource to promote strategic planning across all STEM departments; and (iii) strengthening the contribution of careers specialists in curriculum planning.

STEM subject teachers should have professional development that builds their knowledge and understanding of careers and the labour market, so that they are better able to support pupils’ career-related learning.

School leaders should carefully consider the impact of scaling down careers support in school, in light of the Education Bill. The temptation to interpret the statutory requirements at a minimum level will be detrimental to pupils’ futures.

The importance of parents and families in influencing pupils’ career choices is often overlooked. Since many adults are fearful or simply unaware of STEM subjects, Government, schools and other agencies should consider how to increase parents’ awareness and confidence.

Informal STEM learning activity should be more explicitly linked to careers. There should also be more enrichment and enhancement opportunities in mathematics, design and technology, and engineering.

Schools should make use of the STEM strategic planning tools to help establish an environment in which STEM careers activity can take root and flourish. The STEM manager can be found at http://www.iwebsolutions.co.uk/wip/Stem/Planning-Tool-Jan/manager/index.html. (User Name: iweb; password: developer).

The full report can be found at:


Alternatively, search on the terms ‘Good timing STEM careers’ using a search engine.
1. **INTRODUCTION**

The Vorderman Report (2011) has reinvigorated debate about the state of mathematics education in England. The statistics it cites are stark: nearly 50% of students fail to achieve GCSE Mathematics in secondary education and England ranks amongst the lowest in the world for rates of students studying mathematics in upper secondary education.

This report explores different approaches to mathematics education in secondary and upper secondary education in the context of the Vorderman Report recommendations. The paper draws together recent research and policy work in the field to draw out key themes including why mathematics is important both for individual attainment and broader educational and economic goals and the main challenges that hinder England’s students from more successful performance and progression. The paper then provides examples of successful or pilot mathematics reforms being trialled in other countries to shed light on and learn from practice overseas that is relevant to the Vorderman recommendations.

The report does not recommend directly importing practice from either of the case study sites, high-achieving Hong Kong or neighbouring Scotland, but rather that their experiences of wide-ranging reforms should inform debate in England.

2. **BACKGROUND**

Whilst the attainment of English students is at best stable, or even in decline, mathematical skills are growing in importance. Basic numeracy and quantitative skills are increasingly necessary in all jobs and life-skill tasks including budgeting and data-handling. And the changing nature of the international economy means that maths skills and knowledge are in higher demand than ever. Science, Technology, Engineering and Mathematics (STEM) industries are becoming increasingly central to economic competitiveness and growth and will provide many of the jobs of tomorrow for young people (Royal Society, 2011).

The reasons for England’s relative underperformance in both attainment and progression are numerous. A growing culture of league-tables and ‘teaching to the test’ (or, performativity) in schools means that decisions about how mathematics is taught and assessed in schools are not always in the best interests of students and have actually resulted in counter-productive practices such as multiple and early entry to GCSE. With insufficient emphasis on functional and basic skills, and post-16 pathways that are usually limited to academic GCE Mathematics or GCSE re-takes, the current range of qualifications has further neglected learner needs and turned many students away from the subject.

There is a range of curriculum and qualification reforms already being explored and in some cases piloted in England. These include the Vorderman Report endorsed ‘linked pair’ GCSE qualification which makes clearer differentiation between functional and academic skills; the recommendation to make some form of mathematics compulsory until 18; and the widening of upper secondary mathematics pathways to include a Mature GCSE and a Maths for Citizenship qualification.

3. **INTERNATIONAL CASE STUDIES**

Our international case studies similarly emphasise a distinction between academic and functional mathematics: junior secondary education in Hong Kong incorporates both functional and academic content for all students. The favoured approach in Scotland is splitting mathematics into two separate qualifications (Mathematics and Lifeskills Mathematics), with one focusing on academic mathematics and the other on functional and workplace skills.

The case studies also emphasise the importance of being as flexible as possible to meet learner needs, in sharp contrast to the regimented and examination-driven approach that characterises England’s mathematics qualifications. For instance, some Scottish qualifications have no external examinations and the country’s bi-level approach means students can move between qualifications easily depending on the
extent of their progress.

In both Hong Kong and Scotland, upper secondary mathematics qualifications prioritise diversity in curriculum content over diversity in qualification type. In fact, in both countries all students take the same qualifications (in Scotland the Higher and in Hong Kong the NSS). The Higher allows students to study the application of mathematics to real-life and the Hong Kong Diploma allows high-attaining students to specialise in calculus or algebra through the Extended Part. The key point being that in both cases – Hong Kong and Scotland – qualifications are available at different levels and incorporate relevance to the real-world in all qualifications, leaving mathematics in these countries more flexible and less niche.

4. **RECOMMENDATIONS**

More detail on the case studies and how they compare to mathematics education in England is available in the main body of the report but the approaches they outline which might inform or give strength to our own reforms and the recommendations of the Vorderman Report are as follows:

- Qualifications need to be flexible and bi-level to allow students to progress at their own speed and aim for the highest possible grade (as per National 4 and 5 in Scotland). On this basis the linked pair of mathematics GCSEs currently being piloted should be rolled out across England.
- Upper secondary education should offer more than re-takes for students who have not gained GCSE Mathematics
- Further consideration of making mathematics compulsory for all students in upper secondary education is needed and should draw on Hong Kong’s NSS experience
- Mathematics qualifications in secondary and upper secondary education should incorporate functional and academic content (including arithmetic)
- Assessment arrangements should limit performativity, for instance through some element of teacher-led assessment for students studying foundation-level qualifications
- Too much diversity in qualification type can be confusing for students, education-providers and employers. Diversity in curriculum content can be a better route for meeting diverse learner needs (as with the Scottish Higher and Hong Kong’s NSS)
- Once the pilot and evaluation of the linked pair GCSEs is complete, the mathematics community should come together over a one or two day period to consider the big picture and learning from overseas, and develop definitive recommendations for the future of mathematics education in England.

The ideas and examples from home and overseas outlined in this paper should provide some food for thought, in some instances strengthening the case for intended reforms and in others providing new and sometimes challenging thinking. Both will be necessary to realise the goal of creating a ‘world class mathematics education for all’.

The full report can be found at:


Alternatively, search on the terms ‘Maths problem’ within the RSA website.

The 2011 Vorderman Report can be found at

1. **INTRODUCTION**

This independent review of cultural education in England follows on from the independent review of Music Education in England, published in 2011. In this review 'cultural education' includes: archaeology, architecture and the built environment, archives, craft, dance, design, digital arts, drama and theatre, film and cinemas, galleries, heritage, libraries, literature, live performance, museums, music, poetry and the visual arts. The review makes the case that all children and young people in England, no matter what their background, circumstances or location, should receive the highest quality Cultural Education both in school and out of school, in formal and in informal settings. It argues that schools remain the single most important place where children learn about Cultural Education in the form of lessons in subjects such as history, English literature, art and design, design technology, drama, dance, film studies and music, alongside programmes of after school activities for children who wish to pursue a passion for a particular art form.

This DSS summary presents a synthesis of selected recommendations within the report.

2. **RECOMMENDATIONS AT THE LEVEL OF SCHOOLS**

Each primary and secondary school should nominate a member of the Senior Management Team to act as a Cultural Education Champion. This position should be mirrored in cultural organisations, which should themselves be encouraged to appoint a trustee with particular responsibility for and interest in education.

**Cultural education in schools**

- Greater priority should be given to the importance of Design as a curriculum subject within schools.
- Consideration should be given to promoting Dance and Drama to subject areas in their own right
- Most children and young people should be encouraged to take part in the Arts Award and Junior Arts Award, which should be regarded as a valuable qualification.
- Ofsted should be encouraged to comment on each individual school’s Cultural Education provision as a specific part of their inspections, focusing on the quantity and quality of cultural activities that take place within the school outside of lesson times, as well as within the school curriculum. It would also take note of the partnership links developed by the school with local cultural organisations.

**Cultural education and teachers**

A new scheme should be developed across the entire cultural sector to allow teachers to remain in touch with relevant professional developments outside of education. Schools should:

- Help teachers to build links with industry to ensure that their knowledge remains up-to-date (possibly using Inset Days for teachers of Cultural Education subjects).
- Encourage teachers to continue with their artistic practice wherever possible. There should be a moment in each school year where the artistic practice of teachers (as artists, designers, writers, poets, actors, musicians, dancers etc.) is celebrated either through a performance or exhibition.
- Demonstrate to both Newly Qualified Teachers and to experienced teachers the benefits and value of Cultural Education to children and young people
- Cluster to share expertise in particular areas to show off best practice to Newly Qualified Teachers and mentoring from more experienced teachers should be made available.

3. **RECOMMENDATIONS AT THE LEVEL OF GOVERNMENT AND POLICY**

There is currently no over-arching strategy for the commissioning and delivery of Cultural Education in England. The government should develop a single National Cultural Education Plan. A new cross-Whitehall ministerial group on Cultural Education should be set up, under the chairmanship of the Culture Minister or an Education Minister.

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**Partnerships**

Consideration should now be given to rolling a structure out across the Cultural Education spectrum, to enable meaningful partnerships on the ground across different art forms and using all of the expertise and venues that are available in a given area.

Arts Council England, the Heritage Lottery Fund, the British Film Institute, the Big Lottery Fund and English Heritage should work together to form a new Cultural Education Partnership Group (CEGP), ensuring that their individual strategies/plans in the area of Cultural Education cohere.

It is vitally important that government maintains a strong relationship with cultural practitioners, so it is suggested that an advisory group of top level practitioners, who are household names and well respected for their particular areas of expertise, be recruited to champion Cultural Education to the public at large.

**Ofsted**

Ofsted should be commissioned to create a guide to working with schools for cultural organisations. This would clearly and unambiguously set out the criteria, which Ofsted uses to judge whether learning is of a high standard. Classroom teachers are currently judged on these criteria and it seems both sensible and desirable for education professionals from the cultural sector to have their work assessed in the same way. The guide would also be of use to Headteachers who are making decisions about what to commission in their own schools.

Ofsted should be encouraged to undertake a review of the standards across all Cultural Education subjects, rather than looking at them in standalone silos. The outcome of this Review would enable a more detailed understanding of the place of Cultural Education in schools in England today. New qualifications aimed at cultural practitioners who also work in the education field should continue to be developed, as these qualifications professionalise and give greater recognition to this part of the workforce.

**Actions for government**

The government should recognise the need for exceptional funding for culturally based conservatoires, which train the artists, actors, dancers and musicians who will create and perform the culture of the future. The funding settlements for these conservatoires should be secured for the long-term.

The government should continue to fund specialist training in Dance and Drama. However, it should ensure that any future arrangement offers a coherent approach to managing and funding support for the identification and training of exceptionally talented performers. This support should be targeted towards those students who would not otherwise be able to afford to undertake the training courses.

A new permanent national youth dance company should be created and funded under the auspices of the Music and Dance Scheme.

A single destination website should be created, bringing all Cultural Education resources together in one easily accessible place online.

In partnership with commercial sponsors, the government should consider the introduction of a National Schools Culture Week across England.

4. **AWARDS AND RECOGNITION OF QUALITY**

The CEPG should consider establishing a new Cultural Education Passport scheme for children between the ages of five and nineteen, which records all of their in-school and out of school cultural activities, enabling parents, carers and teachers to understand what each child has achieved and to plug any gaps in knowledge and experience.

The government should consider the creation of Downing Street Cultural Education Medals, presented by the Prime Minister or the Deputy Prime Minister.

Arts Council England should consider requesting Royal Patronage for the Arts Award.

1. INTRODUCTION

The Ofsted report summarised here is based principally on evidence from 194 specialist music inspections and good practice visits in schools between 2008 and 2011, including provision in class lessons, additional instrumental and vocal tuition, and extra-curricular musical activities. Part A of the report summarises the inspection judgements, including the context of government-funded initiatives for widening participation in instrumental learning and singing. Part B considers seven key reasons for differences in the quality of music education experienced by different groups of pupils in different schools. This summary mainly uses the text of the Ofsted report.

The report refers to the recent DfE report ‘The Importance of Music’ and to the Henley review of music in England. Henley has since conducted a review of cultural education, which is included in this set (March) of summaries. To help schools and others interested in improving music teaching, Ofsted has produced six new films exemplifying good practice in a wide range of settings.

2. SELECTED KEY FINDINGS

• Good or outstanding musical education was seen in 68 of the 180 primary and secondary schools inspected. In 41 of the 180 schools, provision for music education was inadequate. These results compare poorly with overall school performance in inspections.

• There was considerable variation between the participation rates of different groups of pupils. In primary schools, one in every three girls was participating in extra-curricular music, compared with one in every seven boys. In secondary schools, only 6% of students with disabilities or special educational needs were involved in additional instrumental or vocal tuition, compared to 14% of students without these needs.

• The most effective schools recognised that regular, sustained experiences were essential to secure good musical progress.

• Too much music teaching continued to be dominated by the spoken or written word, rather than by musical sounds. Lessons were planned diligently, but not always prepared for musically.

• Assessment in secondary schools was frequently over-complicated and did not focus enough on the musical quality of students’ work.

• Achievement in singing was good or outstanding in only a third of the primary schools visited. Singing was a major weakness in nearly half of the secondary schools visited.

• The use of music technology was inadequate or non-existent in three fifths of the primary schools and over a third of the secondary schools inspected.

• Local authority music services made good contributions to the musical and personal progress of particular groups of pupils. However, there were considerable inequalities in funding and provision between local authorities, and between schools within local authorities.

• Not enough school leaders and managers were holding external partners to account, or robustly challenging the quality of classroom curriculum music provision in their own schools. There was limited take-up and impact of continuing professional development (CPD) in both primary and secondary schools.

• Continued government funding and support for music education is welcomed by Ofsted, as are the new music hubs from September 2012. However, the quality of schools’ music provision and their coordination with external partnerships is of crucial importance.

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4 See Document Summary Service Summary DSS11/12 17, December 2011
5 This can be found at https://www.education.gov.uk/publications/standard/AllPublications/Page11/DFE-00011-2011
6 These are published on the Ofsted website http://www.ofsted.gov.uk/resources/music-schools-wider-still-and-wider
3. **RECOMMENDATIONS**

Schools, all other funded providers of music education, and providers of Continuing Professional Development should work together to:

- **challenge inequalities in musical opportunities and participation among pupils and between schools by:**
  - regularly monitoring the participation and retention of pupils from different groups in musical activities, developing strategies that lead to increased participation in musical activities by under-represented groups of pupils and ensuring that additional funding and opportunities reach the schools and pupils in most need.

- **promote teachers’ use of music as the dominant language of musical teaching and learning by:**
  - ensuring that lesson planning includes a strong focus on the teacher’s musical preparation as well as defining lesson structures and procedures
  - establishing musical sound as the ‘target language’ of teaching and learning, with talking and writing about music supporting the development of pupils’ musical understanding
  - developing and refining teachers’ listening and musical modelling skills.

- **plan for pupils’ good musical progression through and across the curriculum by:**
  - giving sufficient and regular curriculum time for the thorough and progressive development of pupils’ aural awareness and musical understanding
  - providing robust curriculum plans that identify the landmarks of musical understanding pupils are expected to achieve, in addition to the range of musical styles and traditions that they are to experience
  - ensuring that different initiatives, including whole-class instrumental and vocal programmes, are planned as part of an overall curriculum vision for music for the school.

- **improve pupils’ internalisation of music through high-quality singing and listening by:**
  - taking every opportunity to raise standards of singing work in primary schools, including in class lessons and in whole-school singing sessions
  - significantly improving the quantity, quality and diversity of singing work in secondary schools, particularly in curriculum lessons
  - making more effective use of vocal work in all aspects of music education, including to help pupils better listen to and analyse music.

- **use technology to promote creativity, widen inclusion, and make assessment more musical by:**
  - significantly improving the use of music technology to record, store, listen to and assess pupils’ work
  - placing greater emphasis on pupils’ musical development through the use of technology – with the acquisition of technical skills and knowledge
  - supporting, rather than driving, musical learning and making more creative and effective use of music technology to support performing and listening work.

- **strengthen senior leadership of music in schools by:**
  - increasing headteachers’ and senior leaders’ knowledge and understanding about the key characteristics of effective music provision, including the appropriate use of musical assessment and the importance of teachers’ musical preparation, so that they can more effectively observe and support music in their schools.

The Department for Education should support sustained music-making opportunities for pupils in schools beyond national advocacy, structures and strategies by:

- rigorously and independently holding all publicly funded music education initiatives, including music hubs, to account for the quality and effectiveness of their work
- ensuring that headteachers are better informed about funding and organisational arrangements for the delivery of additional music education provision and encouraging them to play a full part in evaluating and challenging the quality of this provision.

*The full report can be found at: [www.ofsted.gov.uk/publications/110158](http://www.ofsted.gov.uk/publications/110158)*
1. INTRODUCTION

This report presents the views of the Innovation Unit on how our education systems might change and adapt to meet the needs of 21st Century learners. Our summary has picked out the key points, using the language of the report. It begins with the Innovation Unit’s introduction which outlines the background to their project and goes on to present a short version of their vision. We recommend a visit to their website which provides a range of related reports and resources.

2. BACKGROUND FROM THE INNOVATION UNIT

People make a lot of assumptions about education. Lessons should last for about an hour. Mobile phones should be switched off during school. Students should learn in classrooms. And, fundamentally, students come to school to learn, and teachers come to school to teach. These assumptions are so common because they match the way that most of us were educated.

But this version of education was designed in and for a very different time, and there’s no reason to assume that it will meet the needs of today’s learners.

Despite the fact that teachers are working as hard as they have ever worked, schools are struggling to engage young people and schools are also struggling to prepare young people for work.

This only covers the problems of today. In the coming decades, the changes we are experiencing now - to politics, economics, technology, and climate – will become even more dramatic.

Education systems have been resistant to change because education is so important – too important, some would argue, to experiment with. There is another way to look at this: in a rapidly changing world, education is too important to be left behind.

In response to this, schools are starting to do education differently. The schools that are taking this seriously are still in the minority. But around the world there is a growing global movement towards achieving the vision of 21st century education.

3. A VISION FOR 21ST CENTURY EDUCATION

Open up lessons

The 45–60 minute lesson has reigned supreme in school systems around the globe for a long time, forcing teachers to execute their lesson plans with military precision. Never mind if students haven’t fully grasped the subject matter before the bell rings – time, after all, waits for no man. Increasingly, however, schools are embracing the idea that a lesson can be many things. Organic or structured. Long or short. Based within or beyond school premises.

Think outside the classroom box

In a traditional classroom, students sit in rows at individual desks or small tables, facing the teacher: designed so that teachers can efficiently transmit information to groups of students. But in an age in which wireless internet means we are literally surrounded by information, we no longer need students in rows facing the teacher. The role of teachers can no longer be to impart knowledge but to guide, discuss and, of course, measure the progress of students so that they know when more support is needed. Today, innovative schools are designing classrooms for the pursuit of knowledge, rather than its conveyance, and even doing away with them altogether.

Get personal

Good teachers have always taken account of the fact is that everybody has ‘special educational needs’, but the structure of conventional schools limits the extent to which they can personalise learning. In most schools everyone studies the same thing, at the same time, in the same way. What is personalised,

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7 http://www.innovationunit.org/
generally, is how much they are expected to understand. This has come about because when one teacher is presenting material to a large class there is not enough time to provide each student with a course of learning tailored uniquely to suit them. However, this is beginning to change, partly (though not entirely) because of digital technology.

**Tap into students’ digital expertise**

Technology has revolutionised our relationship with information in the real world, and we take for granted our ability to access it anywhere, at any time. This is even more pronounced for young people who have grown up with technology as an integral and ever-present part of their lives. Today’s students are natural investigators, researchers and synthesisers of information. These skills can be put to powerful use in any classroom: the days of IT as a discrete subject, taught at designated times in computer labs, are numbered.

**Get real with projects**

Today, a growing number of young people are learning by carrying out projects that require them to carry out research across subject boundaries, create a professional-quality product that demands multiple drafts, and publicly present their work to their peers, their parents and the wider world.

**Expect (and help) students to be teachers**

Students have long been informally inspiring, advising, supporting and offering a listening ear to their friends and classmates. Indeed, schools are beginning to recognise the potential of harnessing and developing these assets in order to help students to work in complementary ways alongside teachers, enabling them to play a more active part in shaping their own education and that of their peers.

**Help (and expect) teachers to be students**

The challenges of the 21st century place demands on young people to be good learners. They need to be resilient, independent and flexible learners, able to make mistakes and learn from them, willing to take ownership of their learning, ready to use different learning strategies to navigate and adapt to a rapidly changing world. If students are to achieve this they must have effective ‘teachers of learning’, who fully understand the process of learning – and the best way for teachers to achieve this is to become learners themselves.

**Measure what matters**

Assessment matters. What we choose to assess inevitably determines what is taught. And how we assess it influences how we teach it. Therefore, the question that every educational system must ask is, “Are we assessing what we want students to be able to do once they finish school?” If we want students to leave school prepared for adulthood, we need to make sure they have experienced and mastered the skills they will need in a context that accurately reflects the world outside the school walls.

**Work with families, not just children**

It is widely recognised that involving parents in their children’s education is crucial – there is a strong association between family involvement and student achievement. Many schools are recognising the need to work with parents, in a variety of ways, to help their students be the best they can be. And some schools are going much further than this, finding holistic and innovative approaches that form bridges between the school and community.

**Power to the student**

‘Student voice’ – that is, giving students the opportunity to have a say in issues that affect them, has come a long way since the experiments of a few radical schools in the 1970s. Many schools now boast student-led School Councils, for example but it remains the case that very few students are involved in key strategic decision making in their school, and fewer still at a regional or national level. But increasingly, educators are cottoning on to the potential this has to change both the experiences of students, and the entire education system.

**The full report can be found at:**


Alternatively, search on the terms ‘10 ideas for 21st century education innovation unit’ on a search engine.
1. INTRODUCTION

This document summary reports on a literature review in the context of Australian education, where the Australian National Assessment Program – Literacy and Numeracy (NAPLAN) was commenced in 2008 by the Australian Curriculum, Assessment and Reporting Authority (ACARA) in order to assess all students in Years 3, 5, 7 and 9 in Australian schools using national tests in Reading, Writing, Language Conventions (Spelling, Grammar and Punctuation) and Numeracy. It explores international and Australian literature on students’ experience of standardised testing. It is based on a search and review of the scholarly research published on the implementation and impact of high stakes testing around the world. Much of the research is from the United States and the United Kingdom, as these are two of the nations with the longest histories of standardised high stakes testing and reporting of student achievement. Recent, related studies which have emerged in the Australian context are also included, although these are limited. The literature search focussed on the reported impact of high stakes testing on students (their health, well-being and learning) rather than the technical aspects of the design, implementation and reporting of the testing programs.

2. BACKGROUND

This literature review was commissioned by the Whitlam Institute within the University of Western Sydney (UWS) to provide context for the research project The Experience of Education: The impacts of high stakes testing on school students and their families. The project is a collaboration between the Whitlam Institute, the University of Melbourne and the Foundation for Young Australians.

The project seeks to examine whether the regime of high stakes testing throughout the school years is in the best interests of the students. The research aims to identify what the impacts of high stakes testing such as NAPLAN are on school students and their families, not only in terms of curriculum and learning but also with regards to students’ health and well-being.

As high stakes testing becomes more deeply embedded in the educational landscape it is important that issues such as these be investigated as a basis for better informed policy making.

3. THE LITERATURE REVIEW

• The Australian National Assessment Program – Literacy and Numeracy (NAPLAN) was commenced in 2008 by the Australian Curriculum, Assessment and Reporting Authority (ACARA) in order to assess all students in Years 3, 5, 7 and 9 in Australian schools using national tests in Reading, Writing, Language Conventions (Spelling, Grammar and Punctuation) and Numeracy.
• Although there are several key differences between the Australian NAPLAN/MySchool model and the UK and USA models of student assessment programs, the publication of the results of the NAPLAN program on the MySchool website, with the associated media coverage, means that NAPLAN too may be labelled as a high stakes testing program.
• A range of concerns regarding the impact of high stakes testing is evident in the international literature. These range from the reliability of the tests themselves to their impact on the well-being of children. This impact includes the effect on the nature and quality of the broader learning experiences of children which may result from changes in approaches to learning and teaching, as well as to the structure and nature of the curriculum.
• Concerns in the international literature regarding the reliability of high stakes testing programs are largely centred on their capacity to achieve their own objectives of impartial, reliable and unbiased reporting designed to facilitate student, school and system improvement, without unintended negative consequences for the standing or reputation of particular schools.
• Considerable evidence may be found in the international literature regarding the negative impact of high stakes testing on students’ well-being, including its potential to impact on students’ self-esteem and lower teachers’ expectations of children. There is also evidence of negative effects on service delivery and professional-parent relationships and stress, anxiety, pressure and fear experienced by students.

• Detailed findings such as these are not available in the Australian context, although similar concerns regarding NAPLAN have emerged from various sources, including a recent Australian survey of principals and teachers in independent schools, the recent Senate hearing into NAPLAN testing and reporting and a recent Queensland Studies Authority report, which expressed concern at the capacity of full cohort testing to lower the self-esteem, self-image and long-term confidence of under-performing students, thus widening the gap between them and high-achieving peers.

• There is considerable evidence in the international literature of the impact that high stakes testing can have on the quality of the learning experience of children. Evidence has emerged that such testing can structure the educational experiences of students in ways that limit the development of the range of skills and literacies needed in the modern world, encouraging low-level thinking and promoting outcome measures rather than the intrinsic processes of learning and acquiring knowledge.

• Research on high stakes testing has also found that these tests may be having a negative impact on teacher pedagogies with a resultant degradation of students’ experience of learning. The impact of this may be defined as a shift from a focus on the needs of the child to the needs of the evaluation and reporting process.

• Research also documents the impact of testing on the curriculum, showing that teachers will focus on the areas in which students will be tested, while reducing the proportion of class time devoted to curriculum areas not included in state tests. This influences curricular structures in terms of content, since the content of standardised tests defines what may be regarded as legitimate knowledge, and in the way in which content knowledge is presented in the classroom, with this increasingly aligning to the way it is presented and assessed in the tests, that is, as isolated and largely unconnected facts and pieces of information.

• Some evidence has also emerged in the Australian context of a narrowing of the curriculum as a result of high stakes testing.

• What emerges consistently across this range of studies are serious concerns regarding the impact of high stakes testing on student health and well-being, learning, teaching and curriculum. Although much of the literature is focussed on the USA and the UK, the consistency of these findings raises legitimate questions and deep concern regarding the Australian experience. The introduction of national standardised testing in Australia is a significant educational reform. It is important that such a reform be underpinned by rigorous research to ensure that it advances the interests of students. For this reason, it is important to investigate the extent to which we can extrapolate these findings of the largely negative impact of testing in the international context to the NAPLAN program recently implemented in Australia. There is a particular need for research that explicitly recognises the best interests of the students as a primary consideration and which collects evidence from a range of stakeholders, including the children themselves.

The full report can be found at:

Alternatively, search on the terms ‘experience of education impact high stakes assessment’ using a search engine.