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GIRLS' SCHOOLS AUSTRALASIA

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25
YEARS

LEADING EMPOWERING CELEBRATING



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Vol. 56 Entrepreneurship in schools

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ALLIANCE OF GIRLS SCHOOLS AUSTRALASIA

The Alliance of Girls' Schools Australasia is a not for profit organisation which advocates for and supports the distinctive work of girls' schools in their provision of unparalleled opportunities for girls.

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THE ALLIANCE ON THE GLOBAL STAGE FROM THE ALLIANCE PRESIDENT

The year 2015 continues to hold promise for girls thriving in girls' schools. In a recent report by the Organisation for Economic Co-operation and Development (OECD, 2015) on gender equality in education some alarming statistics were highlighted. There is no doubt that the momentum for girls' education is alive and well on the international stage. The first ever Global Forum on Girls' Education in New York showed that our Australasian region is ahead of the pack in terms of addressing the theme, 'Creating a World of Possibilities'.

The Global Forum on Girls' Education, hosted by the National Coalition of Girls' Schools (USA & Canada), in partnership with the Alliance of Girls' Schools Australasia and the Girls' Schools Association (UK), invited 950 delegates from 23 countries, including principals, researchers, advocates, authors, practitioners, and related-industry leaders, to come together in New York and collaborate on the impact of girls' education through the theme of 'Creating a World of Possibilities'.

As President of the Alliance of Girls' Schools Australasia, I was privileged to lead a large contingent of Alliance school leaders and two of our corporate partners, Bond University and CIRCLE, at this forum. We exchanged best practices and innovative approaches for academic excellence and the healthy development of girls, addressing the topics of Leadership, Health & Wellness, STEAM, Civic /Community Engagement, Classroom Innovation, Strategic School Advancement, Testing & Assessment, and Teaching & Curriculum.

The presentations focused on how the world is changing and what that means for how we prepare our schools and our students for the future. We were privileged to hear outstanding addresses by keynote speakers including writer and political activist Gloria Steinem, Huffington Post editor-in-chief Arianna Huffington, former athlete Baroness Sue Campbell, and Australia's Holly Ransom, CEO of Emergent Solutions and 2014 Chair of the G20 Youth Summit who tweeted, "I'd like to extend my gratitude to the outstanding educators around the world who devote their lives to the empowerment of women and girls. I'm personally indebted to you, and it's been such a pleasure to meet so many of you today."

The impact of such great sessions are too numerous to mention here, but some key highlights for me included the new understandings from Rachel Simmons about the myth of 'Effortless Perfectionism' and what schools can do about it, and the insights

practising principals had in supporting LGBTI students in their schools and the implications for girls' schools. I was proud that we had such a large contingent from Australia, as well as enthusiastic representatives from New Zealand, South Africa and the Philippines and that we were able to provide terrific input, share so many wonderful examples of our practice and make some worthwhile connections for the future as we continue to provide unparalleled opportunities for girls. In conjunction with the forum, The Power of All-Girls Schools video was launched featuring girls from girls' schools around the world, including several Alliance schools, talking about the importance of education for girls. The video was produced by the The Young Women's Leadership Schools and the National Coalition of Girls' Schools. The Forum highlighted the great momentum for girls' education around the world and the fact that we must consider education as a global enterprise. It was also inspiring to be around so many passionate, knowledgeable and energetic educators and leaders.



(ABOVE): FRAN REDDAN SPEAKING IN NEW YORK CITY AT THE GLOBAL FORUM ON GIRLS' EDUCATION

Further highlights for Alliance delegates included a dinner at the Harvard Club and for our members and 'old girls' of our schools, a reception hosted by the Australian Consul-General, Nick Minchin, at the Australian Consulate. It was a pleasure to see so many alumnae connecting with current principals at this event, to launch our 25th anniversary year and to address the audience about the positive impact of girls' education in Australia and around the world. ▲

FRAN REDDAN

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ENTREPRENEURSHIP IN SCHOOLS FROM THE EXECUTIVE OFFICER

"Entrepreneurship is inseparable from education – not independent of it." – Professor Ian Chubb

In October 2015 Australia's then Chief Scientist Professor Ian Chubb released a report *Boosting high-impact entrepreneurship in Australia*. The report found Australia was lagging behind other countries on innovation, with universities failing to encourage students and academics to become entrepreneurs. While Australia ranked ninth in the world on the quality of its scientific research organisations, it ranked only 72nd on translating its innovation investments into results. Countries including the US, the UK and South Korea all introduce entrepreneurship in schools and expose young people to start-up cultures.

Shortly afterwards, on 7 December 2015, Malcolm Turnbull, in his first major economic statement as Prime Minister, unveiled a \$1 billion plan to foster greater innovation in Australia. Among the measures are plans for education in the STEM subjects – Science, Technology, Engineering and Maths – in a bid to "kick start an innovation culture".

We know our girls' schools are bucking the national trend in declining participation in STEM. In a single-sex environment girls, uninhibited by gender stereotypes, are more likely to study STEM subjects, are more confident, assertive and curious to experiment and to ask "why?" and – importantly – many clearly believe that STEM careers are exciting and rewarding.

This issue of *In Alliance* looks at the incredible work our girls' schools do to encourage and enable young entrepreneurs. From including enterprise as a strategic priority and developing an enterprise academy to creating products and ideas that change the world for the better, are commercially successful and award-winning. Schools are teaching entrepreneurship through a synthesis of practice and theory, where

student acquire skills, knowledge and mindset through hands on activities taught from the perspective of theory. What stands out is students' savvy use of social media, digital marketing, and technology to develop and distribute their products. There are many examples of STEM related entrepreneurial projects with tangible outcomes. Ultimately entrepreneurship is about confidence. Having the self-confidence to face challenges, take risks and fail is often cited as a key trait of successful entrepreneurs. Gender differences in risk aversion and competitiveness are the subject of the Research Review on page 22.

Professor Alison Booth has written the Research Review for this edition of *In Alliance*. Alison is Professor of Economics at the Australian National University, and Research Fellow of the Centre for Economic Policy Research (CEPR), London, the IZA Bonn, and the Institute for Employment Research (IAB), Nürnberg. Alison's research in the area of the economics of gender and specifically the impact of single-sex classes has provided support for the case for girls' schools. The review, *Can Single-sex Schooling Modify Young Women's Preferences? Some Experimental Evidence* outlines two experiments undertaken by Alison and her colleagues to investigate gender difference in risk aversion and competitiveness and the role a single-sex environment plays in modifying these. Extracts of Alison's research can also be found on our website, and Alison will be a keynote speaker at the Alliance's conference, Real Girls Real Women, to be held in Brisbane from 22 to 24 May, which I hope you may be interested in attending.

Thank you to all our contributors for taking time to share your expertise and practice. I look forward to connecting with you again during the year. ▲

LOREN BRIDGE

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ALLIANCE FUNDS NEW STUDY ON STEM PARTICIPATION

The low levels of participation in Science, Technology, Engineering, and Mathematics [STEM] are of continuing concern. Governments have recognised that a nation's future prosperity relies on a workforce and citizenry well-versed in STEM-related knowledge, skills, and creativity. For a range of reasons, females in Australia and New Zealand are not as engaged in STEM fields as males. Gender equity considerations are thus enmeshed in the debate on how best to achieve greater STEM involvement. School learning contexts – single-sex or co-educational – also enter the debate on STEM participation in schools.

A new study has been funded by the Alliance of Girls' Schools Australasia. With a focus on STEM, an important aim of the study is to monitor and track the impact of school setting (single-sex or co-educational) on females' subject choices and eventual career paths. To put these findings in context, comparable data will be gathered from males.

Data will be sought from former school students who completed their final year of schooling from 1970 to the present. An advertisement will be placed on Facebook to recruit participants from across Australia and New Zealand. Those replying will complete a carefully constructed online survey. They will be asked to provide biographical information, school type attended, educational background data including subject choices, and to describe their career trajectories. For older respondents, questions will be asked about the schooling options offered to their offspring and why this may have been similar to, or different from, their own.

It should be pointed out that publicly available sources on subject choices and career pathways are not reported separately for students attending single-sex or co-educational schools. Given this official lack of data, selective anecdotal evidence is often used as source material in the media to persuade audiences of

the veracity of claims. This new and important study should provide trustworthy data to fill the void.

Alumnae of Alliance member schools will be able to participate in the online survey and contribute to the research study. We will publicise the details when they become available. ▲

HELEN FORGASZ



Helen is a professor of education in the Faculty of Education, Monash University. Her research interests include gender and equity issues in mathematics education, the affective domain, learning settings, and numeracy across the curriculum. Helen has published widely in scholarly and professional journals, and has co-edited several monographs on gender issues and mathematics learning. She serves on the editorial boards of high quality journals and book series and continues to be an active member of mathematics education research associations nationally and internationally.



GILAH LEDER

Gilah is an Adjunct Professor at Monash University and Professor Emerita at La Trobe University. Her research has focussed particularly on gender issues in mathematics education, on exceptionality – predominantly high achievement, and on the interaction between learning and assessment. She has published widely in each of these areas. She is a past president of the Mathematics Research Group of Australasia and of the International Group for the Psychology of Mathematics Education, and a Fellow of the Academy of the Social Sciences in Australia. She was awarded the Felix Klein medal for outstanding lifetime achievements in mathematics education research and the MERGA Career Research Medal.

MEMBER PROFILE: KILBRED A COLLEGE, VICTORIA

Founded in 1904, Kilbred A College is a Catholic secondary school for girls where Christianity is lived out through core Gospel values and in the Brigidine tradition of *Strength and Kindness*. Kilbred A College is located in the bayside suburb of Mentone and has an enrolment of approximately 960 students across Years 7–12. Kilbred A College is a learning focused school where as individuals and as a whole school community we strive for continuous growth with an emphasis on improving learning outcomes.



(IMAGE) CO-PRINCIPALS, TERESA LINCOLN (L) & NICOLE MANGELSDORF (R)

Through exposure to a rigorous learning environment, an extensive co-curricular program and a deep commitment to social justice, our mission is to inspire our students to pursue academic excellence, express their creativity and embrace opportunities for leadership and service. We celebrate the diversity and unique gifts of our students and encourage and support them to develop into confident and articulate young women.

Q&A WITH CO-PRINCIPALS TERESA LINCOLN AND NICOLE MANGELSDORF

Q. HOW DID THE CO-PRINCIPALSHIP OF KILBRED A COLLEGE COME ABOUT?

When the position of Principal or Co-Principals of Kilbred A College was advertised in 2015, we both believed that we were ready to take on the challenges of being a principal having been deputy principals for a number of years. We saw being co-principals as an exciting opportunity to work together and express our shared passion and understanding for creating a learning focused school community. As a team we felt that we offered considerable experience in leading the education of girls in Victorian Catholic secondary schools across the areas of Wellbeing and Learning

and Teaching. Having known each other for several years we were confident in our ability to work together effectively and therefore submitted a joint application.

Our experience, skills and personalities complement each other and we believed this would enable us to utilise our individual areas of strength to maximize our effectiveness. We had worked together closely through our involvement in the Victorian Catholic Secondary Schools Deputy Principals Association (VCSSDPA) and as deputy principals in neighboring Catholic girls' schools: Nicole at Siena College and Teresa at Genazzano FCJ College. During 2010–2014 Teresa chaired the Conference Planning Committee for VCSSDPA and Nicole fulfilled the role of Secretary. Under our leadership the conference program was transformed from a focus on role responsibilities to building leadership capacity and sustaining ourselves as leaders. In November 2014, Nicole became President of the VCSSDPA and Teresa took on the role of Association Secretary. On both committees we worked collegially and built trust and confidence in each other as leaders. We held each other accountable and had very open and honest dialogue. We had every confidence in our ability to respect, support, enrich and challenge each other in all areas of collaborative school leadership.

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Andrea is a qualified secondary school teacher and an experienced financial services practitioner



In preparing for the interview we were aware that Marian College, Sunshine West (another Kildare Ministries School in the Brigidine Tradition) had successfully had co-principals since 2007. A number of other Brigidine schools in Victoria have also had co-principals at different times, as have schools in the USA and UK.

Q. HOW DOES THE PARTNERSHIP WORK?

Once we were appointed as Co-Principals of Kilbreda College, we met with the current Co-Principals of Marian College who provided much wisdom as to how they had successfully managed the role. They described their co-principalship as the “best professional relationship” that either had had. In planning how we would make this partnership work it became clear to us that we both had to ensure that our communication continued to be open and honest. It would be important for us to be well informed and to ensure that we were aware of the discussions each had been involved in with other members of our community. In this way, staff know that there are no secrets between us and that we share all aspects of our leadership and decision making at the College.

Q. DO YOU MAKE ALL DECISIONS JOINTLY?

Together, we are very clear in our vision for Kilbreda College and have a shared understanding that improved student learning outcomes are central to our decision making. We believe that it is important to share and experience all aspects of the role and therefore do not take individual responsibility for different areas of the College. One of the great benefits of being co-principals is that we can draw on each other's individual strengths and experience, learning from each other as we go. We problem solve and plan together and can support and confide in each other when there are challenges. On a day to day basis we are also able to share the workload, which gives us more time to visit classrooms, attend College events and be a visible presence around the College and within the community.

Our shared vision for leading a high performing, learning focused school was further enhanced through completing the two year International Leadership and Management Program (ILMP). The ILMP connected

us to best international practice and strengthened our understanding of and what it means to lead a learning focused school. We are well connected to international educational thinking and leaders in their fields. We are mindful that research informs us that leadership in schools is crucial to building a culture of high expectations and excellence in learning. It is important for teachers to understand that we teach for learning, ensuring our students have transferable knowledge, skills and understanding. The opportunity to further develop the existing programs at the College and build upon its 112 year history of educating girls is a challenge that we both embrace.

Q. WHAT ARE THE BENEFITS OF CO-LEADERSHIP?

Our appointment as Co-Principals of Kilbreda College in 2016 has brought a new approach to leadership at the College as it is the first time in many years that there have been co-principals. This is an exciting opportunity for us to model collaborative leadership and teamwork to both staff and students. The College benefits from having two leaders who bring much enthusiasm and energy to the role, multiple perspectives and broad experience to draw upon. It is also easier for staff, students and parents to have access to us as we are able to divide our time and attendance at activities and events.

Q. HAVE THERE BEEN ANY CHALLENGES?

Our greatest challenge so far has been managing the never ending flow of emails! Sharing an office has been invaluable as it allows consultation and rigorous discussion, delegating aspects of the task and then getting on with the job at hand.

For any other schools considering a co-principalship model we believe that having two people who share common educational philosophies, values and work ethic is crucial to a successful partnership. In a collaborative leadership model you need to have a high level of trust, be willing to listen, be open to other perspectives and have open, honest dialogue with one another. It is also important that both parties strongly believe in the value and strength of a shared leadership model. Enjoying each other's company is also essential! ▲

ACHIEVING IN BUSINESS AND IN LIFE KILBREDA COLLEGE, VICTORIA

Kilbreda College strives to positively empower young women to achieve in business and in life. We provide a safe environment where girls can extend their thinking and are equipped with the skills, knowledge, and tools to do so. Our girls are encouraged to be innovative and are provided with opportunities to showcase their flare for entrepreneurship.

Mind Your Business, a challenging Year 10 elective, opens students' minds to the world of business – local, national and global. Students interact with local business owners and entrepreneurs, visiting their premises and interviewing them on their motivations to start their own business, legal ownership and responsibilities, choice of location, management strategies and other aspects of successfully operating a business.

The girls also conduct research on Australian female entrepreneurs investigating their backgrounds, motivations, achievements and future aspirations.

Once the girls have created their own business plan they are offered the opportunity to showcase their talent in this field outside of the school environment. In 2015 four Year 10 students from Kilbreda College were finalists in Victoria University's 'I Plan A Business' competition. This competition aims to develop students' business skills by exploring essential elements of the curriculum in new and interesting ways. The girls developed an innovative

social enterprise plan, Clean Schools Australia, identifying a gap in the market for environmental sustainability in schools. Their idea flowed from deep within the Catholic teaching of ecology, highlighting the issues of climate change and the need to raise environmental awareness in schools and the wider community. The girls demonstrated how schools could achieve economic benefit by implementing alternative environmentally friendly processes while also working towards achieving their 'green flag' status, proving they have reached a high standard of environmental sustainability.

Kilbreda College students have a further opportunity to create a business plan in the Victorian Certificate of Education (VCE) Units 1 and 2 of Business Management when they establish and operate a small business during Business Week at the College. The business model they develop involves identifying a potential product or service, budgeting and forecasting, manufacturing or sourcing products, identifying a target audience and creating promotional material that appeals to the demographic. Students also develop a sales plan and then actually manage the business on a daily basis. All profits made during Business Week are donated to charity.

Kilbreda College is committed to empowering young women to believe in themselves and to have high expectations in their learning and life. When a student graduates it is important that she is a well-informed, independent and critical thinker, who is confident that she has the ability and expertise to become a successful young Australian businesswoman if she so chooses. ▲

BRID BENNETT
COMMERCE COORDINATOR

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LOURDES HILL COLLEGE, QUEENSLAND

At Lourdes Hill College, the Business and Technology Faculty strives to exhaust every available resource to provide students with authentic and contemporary learning experiences, in order to help prepare them for our ever-changing world of business. A key focus is for students to embrace entrepreneurship and practise how to become successful young entrepreneurs. In accordance with the Australian Curriculum for Economics and Business, as well as the Queensland Curriculum and Assessment Authority's (QCAA) Senior Business Management Syllabus, entrepreneurship is studied as both standalone units and embedded within contextual studies of the business curriculum.

All students in Year 7 study entrepreneurship in Terms 2 and 4, based on components of the Australian Curriculum. In every class, they investigate what entrepreneurship is, what it means, its characteristics and creativity in the workplace. Every student entering the College is exposed to the foundations of entrepreneurship and this awareness permeates all following Business subjects through their journey at the College.

In Year 10, entrepreneurship is explored as part of the Economics and Business elective subject, with 120 students choosing to study the subject in 2016. As part of their study, students investigate the current global business environment and the impact of Australian businesses trading with a number of international organisations. Students are then given the opportunity to blend theory with practice by participating in the College's Global Trade Fair. The fair provides the students with real-world experience by establishing and operating their own global business venture at this extravaganza event. Students develop a unique entrepreneurial product to sell at the Global Trade Fair and then participate in the planning process of selling that product in a specific overseas marketplace (in accordance with various government regulations, economic considerations, legal requirements and cultural implications). Proceeds from the sale of the products are given to a nominated charity - Caritas Australia benefited in 2015.

The Global Trade Fair is a fantastic opportunity to prepare students for the PierSim Business Island Simulation experience. PierSim is a world-first approach to teaching Economics and Business Education at a secondary schooling level. It enables students to own and operate their businesses in an 'in-world' and 'out-world' virtual simulation. From designing their products to seeing how the share price of their business is trading on the virtual stock exchange, our students adopt the role of an avatar and

trade within the PierSim Business Island Simulation program. Students are then assessed on their entrepreneurial, economics and business decision-making skills throughout the trading period and apply their learnt theory to practice. PierSim is an excellent example of how subject-specific technologies can achieve the intention of the ICT general capabilities that are embedded within the Australian Curriculum for Economics and Business. PierSim also helps students to prepare for university life as this program has now been successfully incorporated into a first-year Accounting for Decision Making subject at one of Queensland's leading universities.

Students studying Business Management in Year 12 complete their entrepreneurship studies by looking at "Entrepreneurs of the Future". They investigate entrepreneurs from around the world and conduct a critical analysis of the success of such people within certain market conditions. The main aim of this unit is to investigate how to learn from those entrepreneurs who have thrived in the global marketplace and how that then transpires into the students' business ideas and business pursuits.

The real-world design of the Business Education curriculum at Lourdes Hill College has transpired into students feeling comfortable in establishing and operating their own real-world online businesses



while still at school. One of our Year 11 students, Grace Cooney, has already become a successful young entrepreneur by creating her own website to sell clothing and jewellery. Through her website www.madebygrace.bigcartel.com, Grace has learnt what has worked in the online marketplace and has thus employed the skillsets she has learnt in business, in order to make successful business decisions and continue to grow her online business. Business is definitely booming at Lourdes Hill College! ▲

SHANE WEIR
HEAD OF FACULTY, BUSINESS AND TECHNOLOGY

INVENTION, INNOVATION AND REAL-LIFE PROBLEM SOLVING

ST MICHAEL'S COLLEGIATE SCHOOL, TASMANIA

The entrepreneurial spirit is alive and well at St Michael's Collegiate School in Hobart. Our Year 9 STEM (Science, Technology, Engineering, Mathematics) elective features a focus on invention, innovation and real-life problem solving.



Recently students were given the challenge of using the school's 3D printer to invent a product that would solve a real-world problem. Students needed a product that would mount an iPhone onto a microscope allowing for the easy capture of photos and videos of the object being examined. This invention would also allow users to broadcast any relevant information onto a large screen via Apple TV.

After being given the brief the girls set about designing their first prototype on Google SketchUp. They printed their digital models on a 3D printer and tested them to ensure they achieved their goal. The mount had to both hold the phone and attach to the microscope at the right angle and distance from

the eyepiece. These constraints required students to work within the engineering process framework, including: defining the problem, researching background information, specifying requirements, brainstorming solutions, selecting the best solution, printing a prototype, and testing and redesigning.

During the elective course students were talked through the basics of contract law including preparing and signing a contract on intellectual property. They investigated how profits would be divided, designated the workload of individuals in the group and devised contingency plans in case anyone left the group or could not complete a task. They also waded through an actual twenty-page business partnership contract as an example of what they would meet in the real world.

A large component of the course comprised engaging students in what it means to be an entrepreneur and how to get a business off the ground. As a result, they were also required to investigate the true cost of producing their product and to price it appropriately. This involved multiple stages of research to calculate the cost of materials, wear and tear on the 3D printer, power usage and postage.

The students ran out of time to launch their product on the market last year however the school now uses these mounts in science experiments. The change in technology has improved our classrooms in a very real and practical way. This year's students have taken the project further and are looking to improve the design. The proposed improvements include developing additional features, such as an app that can calculate the magnification and scale of what is being observed through the microscope.

Studies in STEM have enormous potential for both short and long-term educational benefits. By encouraging our girls to think creatively and harness technology to solve real-world problems they are learning practical and valuable skills in critical thinking, teamwork and innovation. We are keenly anticipating what they will invent next! ▲

GLENN CARMICHAEL, TEACHER OF MATHEMATICS AND SCIENCE

BECOMING THE CHANGE YOU WISH TO BE IN THE WORLD (AND HAVE FUN WHILE DOING IT)
SACRÉ CŒUR COLLEGE, VICTORIA

All Year 9 students at Sacré Cœur, a school from Prep – 12 in Glen Iris, Melbourne take part in our Notre Monde program. Notre Monde, French for “Our World”, was introduced in 2012 and seeks to build on the learning of our Year 7 students who explore their place in school and our students at Year 8 who are immersed in their city.

At the heart of the Notre Monde program our students are asked to consider some big questions facing our world and are encouraged to think outside the square, to take an idea and make it their own. Notre Monde is a weekly, year-long program where a variety of skills are taught and practised through many diverse units. Notre Monde is a year of thinking differently, trying new things, learning new skills, developing a new way of working with all members of the Year 9 community and beyond.

The units vary from the creative production of a zine (small, niche magazine) to film-making with one of our sister schools (there are 150 around the globe!) in Greenwich, Connecticut in the USA. Social justice awareness and outreach is a cornerstone of the program. Students come to appreciate the privilege of their personal situations and the need to become the change they wish to see in the world.

Two of our students, Laura Dann and Zoe Kantanis, from the Notre Monde Class of 2014, love healthy eating and cooking. In their Notre Monde year, they took this love into the production of their zine and produced a publication based around healthy and tasty treats. After Year 9 they opened an Instagram account @funfitandsugarfree and they have over 4000 followers.

This success led to the production of an eBook. The eBook was aimed at anyone who enjoys eating well and promotes good health and delicious taste. Its initial niche market was teenage girls but its influence has



spread far and wide. The eBook has been sold around the world, translated into eleven languages and two years on shows no sign of slowing down. Ten per cent of every book sold is donated to Foodbank, which is the largest hunger relief organisation in Australia.

The pedagogical approach undertaken throughout Notre Monde, regardless of the unit undertaken, always begins with the acknowledgment that our role as teachers is to provide the practical skills that will allow students the confidence to take a risk and try something new, as Zoe and Laura did. These skills differ from unit to unit but a dedicated team of Year 9 mentor teachers work beside the students to support and see the projects through to fruition. Some of the skills that are explicitly taught and modelled are future thinking and visioning, finding “your voice”, systematic planning and reflective learning. The students’ experiences are enhanced through their ability to choose what to pursue within the units. This, in turn enables engagement. Students find themselves in real-world situations, dealing with real-world problems and considering real-world solutions. This program allows them to take their learning and contributions outside of the classroom, and even out of Australia, while pursuing a passion. The students learn practical ways of putting that passion into practice for tangible positive results and a long term contribution to making a difference. ▲

JENNIFER CARTER
 DIRECTOR OF LEARNING AND TEACHING

STUDENTS LEAD APP DEVELOPMENT
MOUNT ST BENEDICT COLLEGE, NSW

A group of Year 9 girls from Mount St Benedict College, Pennant Hills has led the development of a College mobile app. With features including bus arrival notifications, canteen specials, daily notices and the College newsletter, the girls’ ambitious project has been an important foundation in building their leadership skills.

The inspiration for the app came while the girls were participating in the College’s inaugural Year 9 program, Leadership without a Badge. During the Year 9 Camp and then over subsequent Pastoral Care sessions, students were challenged to make a difference within the College community, identifying a need and how they could initiate and develop a change.

The Year 9 App Group focused on the well-being of new Year 7 students and any issues or concerns they may have about starting at the College. Whilst brainstorming ideas that might make Year 7s feel more supported in their new environment, they identified missing a school bus as a stressful situation and focused on how they could alleviate this.

Using the program frameworks, the girls embarked on an extensive consultation process including presenting to their house group and their year group. At each stage the girls had to refine their brief based on the feedback received, including additions for the app.

The girls were also encouraged to seek advice, support and approval from professionals within the College. The College’s Head of ICT was a key mentor for the girls, involving them in briefing the developers as well as the pilot and subsequent launch of the app.

The girls ran the app development as a mini project, all taking specific roles and following a basic project methodology. For most, it was the first time they had worked in this way. Being introduced to terminology such as ‘business requirements’ and ‘change management’ were new concepts for the girls, but seeing the project through to the end demonstrated to them the power and importance of good planning and teamwork.

When asked about their key learning points on the project, two of the student leaders on the Year 9 App Group said they were grateful to have built up their teamwork and project planning skills and could see the importance of having a reliable team in place.

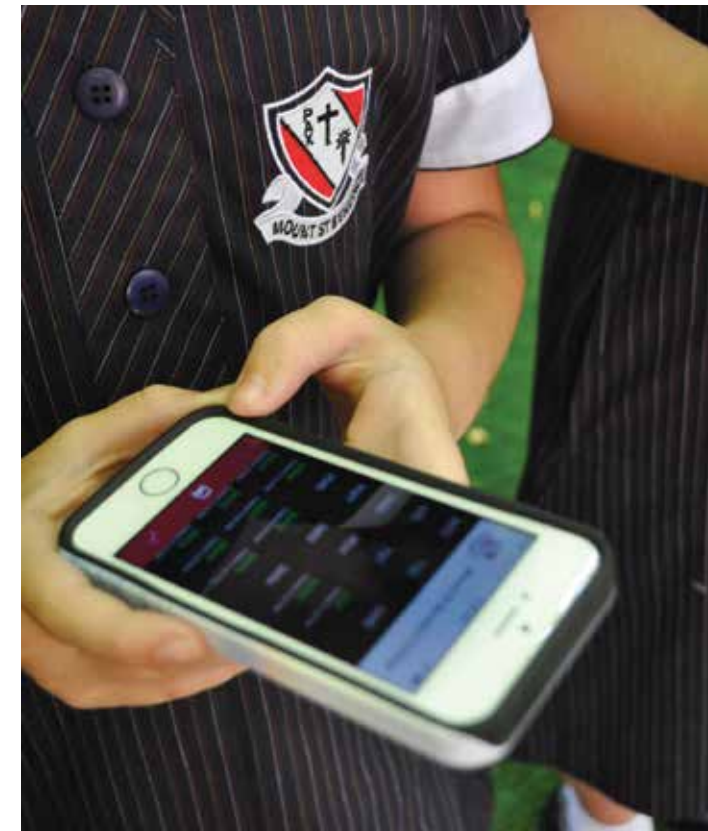
The girls are pleased that their work on the app has been of benefit to the College community and

are excited about further stages planned with personalised content such as individual student timetables.

One of the most popular functions of the app has been the ability for bus departure notifications. Students have the ability to select which bus they wish to be notified about. When that bus arrives at the College at the end of the school day, the app will notify the girls that it is ready to board.

To date there has been a positive response to the app with over 500 students and staff downloading the app since the start of the school year. ▲

KYLIE GRAY
 MARKETING AND DEVELOPMENT MANAGER



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NOT 'BUSINESS AS USUAL' PRESBYTERIAN LADIES' COLLEGE PERTH, WA

Year 10 Presbyterian Ladies' College student Lauren Steel chose to take on the Small Business elective this year because she thought it would be easy and fun. Little did she know.

"It has been hard work and taught me a lot," Lauren said in March as the semester-long unit was nearing completion and the Market Day loomed mere weeks away.

Lauren is part of a Year 10 Small Business elective class that undertakes a campaign to launch and sell a product at school that they must research, produce, price, advertise and sell with the aim of making a profit.

The products being sold this year are candles, bath bombs, body scrub, lip balm, acai bowls, chocolate-drizzled strawberries and marshmallows, fruit icy poles, cookie dough and doughnuts. Any food products must display ingredients on the packaging and the students have been instructed to create a healthy alternative. The profits from sales will go to Youth Beyond Blue.



(ABOVE) BILLBOARD ADVERTISEMENT FOR BATH BOMBS

Teacher Gemma Freel described it as a crash course in running a small business.

"They decided on their products by coming up with ideas of what they thought consumers at PLC would want to buy and then conducting market research to determine whether these were likely to be successful," Ms Freel said. "Once they had selected a product, they conducted further research to find out which flavours, scents, packaging, etcetera would be most popular. They have had to think about branding, competition, promotion, designing order forms and collecting orders, managing their finances, pricing and so forth – much as any business owner would."

Ms Freel is also teaching a Year 10 Graphic Design class and has enlisted these students to design advertising for the Small Business groups, which provided a brief, presented their ideas and negotiated on the final presentation of the ads.

The whole project will culminate in a Market Day at School at lunchtime, where the products will be sold.

Students Tash Bower and Catherine Jones are in both the Small Business and Graphic Design classes. Tash is a member of the group selling lip balm and Catherine's group is making scented candles.

Tash's group is targeting Year 7 students and so they have formulated the lip balm in yummy flavours (strawberry, chocolate, coconut and birthday cake) and ordered packaging and advertising in cute colours and using emojis. But it hasn't all run smoothly.

"It can be really stressful," Tash said. "We ordered 250 containers online but they ended up being much smaller than we expected, so instead of selling them for \$2 each, we have decided to sell two for \$2."

"In Graphic Design, I worked on my own Small Business campaign but my business partners didn't like our initial design; they thought it was too mature for the target audience. So we went back and redesigned the ads for a younger audience, with different pastel colours for the different flavours."

Her group has come up with designs for billboards, posters and television advertising. They have spent about \$150 on ingredients to make their products and if they sell out, they will make about \$100 profit, which will go to charity.

Knowing that candles had been popular sellers in previous years and with a personal interest in making their own, Catherine's group has produced three varieties with a beach theme, in fragrances of Ocean Waves, Pink Grapefruit and Madagascan Vanilla.

"We put out a survey to students and staff asking their opinions on size, colours, scents, prices and types

of jars," Catherine said. "We are doing a wanderlust campaign: you might not be able to go away but the scent of the candle will take you there."

They are making 168 candles and will sell these for \$7 each or two for \$12 and expect to make about \$360 profit. So would the students go into business in the real-world?

"We did not expect it to be as challenging as it was," said Hayley Clarke, whose group is making bath bombs. "It has really taught us real-world skills." ▲

SIMONE CUMMING
PUBLICATIONS & COMMUNICATIONS CO-ORDINATOR



(ABOVE) MINNA GILLIGAN. PHOTOGRAPH BY SELINA OU FOR THE NATIONAL GALLERY OF VICTORIA MAGAZINE.

ENTREPRENEURSHIP IN THE ARTS CATHOLIC LADIES' COLLEGE, VICTORIA

Imagination, creativity and the pursuit of knowledge and wisdom are highly valued at Catholic Ladies' College. Critical thinking and openness of mind are encouraged, along with a love for learning cultivated across all learning areas. Students have many opportunities to develop their entrepreneurial skills, including involvement in activities such as Tournament of Minds, Debating, the student-led and directed College Production and over one hundred student leadership roles. These all attest to the opportunities for formation of entrepreneurial skills throughout the six-year learning journey at the College.

Alumna Minna Gilligan (2008) completed a Bachelor of Fine Arts, Painting with Honours at the Victorian College of the Arts in 2012 and has had a

whirlwind of success, gaining recognition and respect as an emerging young artist. She works with varied media – painting, drawing and collage – and her personal style and art choices have been influenced and inspired by the 60s and 70s.

Minna's popular blog, which she commenced in 2007, is a diary of her thoughts on her affinity with retro discoveries. It is a public self revelation of where she sits within the world of art and her own art world, and has been used by Minna to provide a detailed record of her drawings, collages, paintings and art projects. While in Year 10 Minna was also thrilled to be invited to collaborate as an illustrator for *ROOKIE*, a successful New York teen online magazine.

'THIS WAS THE FIRST TIME THAT I HAVE FELT CONFIDENT IN MYSELF AS AN ARTIST AND FELT THAT I HAVE BEEN RESPECTED AMONGST PEOPLE THAT I ADMIRE ... THAT INVITATION MEANT A LOT TO ME.'

For Minna, participation in Visual Arts and Media classes at Catholic Ladies' College and her role as Visual Arts Captain in 2008 required significant involvement in activities such as the College's Annual Visual Art Exhibition, which nurtured her natural creative and innovative abilities.

In more recent times, Minna was invited to display a collage drawing in the *Melbourne Now* exhibition at the National Gallery of Victoria and also ran an interactive drawing workshop which was open to the public. This was a personal and artistic milestone for her. "This was the first time that I have felt confident in myself as an artist and felt that I have been respected amongst people that I admire ... that invitation meant a lot to me."

Other significant milestones have been: a solo exhibition at the Daine Singer Gallery in Flinders Lane; contributions to the Melbourne Writer's Festival; a performance at the Museum of Contemporary Art in Sydney with folk pop group Pamela; contribution to the Perth Institute of Contemporary Art's annual Salon exhibition; being selected as a studio artist at Gertrude Contemporary; being interviewed and featured in the National Gallery magazine *Gallery Jan / Feb 2014*; and, writing a book with Hardie Grant titled *Time After Time*.

The College community congratulates Minna on her achievements as she has taken a journey via a road less travelled, the 2016 College theme. We are sure that we will hear much more about her achievements and successes in the future. ▲

MARIANNE ROBERTS
ALUMNI COORDINATOR/ARCHIVES

BUILDING ENTREPRENEURS ST CUTHBERT'S COLLEGE, NEW ZEALAND

Entrepreneurs are a very particular type of person – they embrace failure as a learning opportunity, they focus their energies on positive outcomes rather than worrying about negative results, they are adaptable and they see opportunity in many shapes and forms.



Entrepreneurs are also more likely to be men. Forbes magazine recently reported that in 2014 women opened only 36.8 per cent of new businesses in the US. At St Cuthbert's we are seeking to counter this global trend by embracing a leading-edge style of learning that teaches girls there can be infinite solutions to problems and endless possibilities for creativity.

We are instilling querying minds from Year 1 with our Junior School Stretch program. Stretch is designed to do exactly that – stretch our girls in many practical areas that are best learnt through doing. Approaching problems rationally, analysing available information, applying creativity to solutions and learning from errors to formulate a more perfect response are all areas of learning that Stretch caters to.

Stretch allows our girls to choose one STEM subject and one Arts subject, which they study for a semester each. The rational and logical approaches learned in the student's chosen STEM subject and the creative freedom learned in the Arts subject then come together for classroom inquiries, where girls pose a question and work collaboratively to find an answer.

By teaching our girls that there are multiple ways to present solutions to problems, we encourage them to keep exploring until they have found the one that is most persuasive, most clear and most resonant to the audience, an absolutely essential skill for those wishing to break ground as business leaders of tomorrow.

Life experience is another crucial factor in entrepreneurship and from Year 7 at St Cuthbert's we have introduced a new facet to the curriculum, the HUB program. HUB offers students the opportunity to learn

essential skills beyond the curriculum including financial literacy, digital citizenship, global ethics and leadership.

Through HUB our students can also explore future career paths and girls hear from industry experts in a number of fields, including those that have forged their own path as entrepreneurs. These mentors play an important part in our students accepting failure as a normal and even vital part of life. Not every business will be a success, as some of our HUB presenters can attest to, but that doesn't mean failure isn't worthwhile and we instill in our girls the ability to learn lessons, show resilience and have the confidence to try again.



(LEFT) YEAR 1 STUDENTS PARTICIPATE IN THE JUNIOR STRETCH PROGRAM
(ABOVE) YEAR 12 YOUNG ENTERPRISE STUDENTS CREATE REAL PRODUCTS

As well as nurturing our girls' life skills development, we help to advance key business skills. Young Enterprise is offered in Year 12 and girls create real products, implement a business plan and strive to make a real profit.

This isn't the classic lemonade stand business model: our girls create fully-functioning businesses that deliver products to the market in slick and inventive ways. Social media, online sales, professional photography and well-designed websites all play a part in creating sell-out products and award-winning businesses at regional and national levels. Better still, our girls are embracing risk throughout the process, evaluating how much is acceptable and investing real money against their business plan.

It is these kinds of programs that allow our students to create, fail, learn, try again, problem solve and finally succeed within a safe and supportive environment. As a college it is our hope that the creativity, confidence, resilience and initiative fostered within St Cuthbert's enables our girls to back themselves in business beyond the school gates. ▲

JENNA EDWARDS
COMMUNICATIONS & MARKETING MANAGER

JENNI LAMBLY
COMMUNICATIONS ASSISTANT

WINNING PROJECT IGNITES INTEREST IN SCIENCE ST STITHIANS GIRLS' COLLEGE, SOUTH AFRICA

Learning about science is at the heart of a Science Expo project. It is an effective instructional method and is recommended as a cornerstone of successful science teaching. Our society relies more on science every day and engaging in such projects is a great way for students to become more knowledgeable about how the world around them works as it involves active learning or inquiry.

St Stithians Girls' College has made a Science Expo project compulsory for all Grade 10 learners. It is not just a unique learning experience, it also gives students the opportunity to develop skills in a number of areas that are valuable including planning, time management, research, writing, presentation and communication skills.

At school level, projects are judged and the best projects are submitted to Gauteng regional Senior Science Fair, which is the largest regional Science Fair for learners in Grades 7 to 12. Winning projects at the regional fair are then presented at the annual Eskom (South Africa's electricity utility) Expo for young scientists where students have a chance to show their projects and explain their scientific investigations. The Expo aims to support and showcase young scientists from across the continent.

At the 2015 Eskom International Science Fair over 479 projects were on display and a learner from our school, Gabriella Fedetto, was selected to represent South Africa at the 8th International Environmental Sustainability Project Olympiad (INESPO) in Amsterdam, Netherlands from 31 May to 5 June 2016. Gabriella worked with Simran Kaur to develop an automated medicine dispenser and Gabriella represented the pair at INESPO while Simran was away on exchange in Columbia.

It is our intention at St Stithians to expose learners to the exciting world of science beyond the school curriculum and provide opportunities to showcase budding young female scientists. We have had many successes at regional level with many of our learners winning gold, silver and bronze medals but Gabriella Fedetto is our first learner selected for international participation. Her achievement has sparked a very positive interest in the Science Expo at our School and the girls are now more mindful of the endless possibilities and opportunities that could arise from a school science project.

Naledi Pandor, Minister for the Department of Science and Technology, told students not to limit their ambitions, but to "dream widely as you can. There are immense challenges that confront South Africa, but you can be part of resolving those challenges." St Stithians Schools pride themselves on being South African schools making a world of difference and contributing to producing outstanding scientists and researchers. ▲

SHANDHINEE NARGAROO
HEAD OF DEPARTMENT – PHYSICAL SCIENCE

EXCERPT FROM THE WINNING PROJECT SUBMISSION



Purpose of the Project / Experiment:

HIV/AIDS (Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome) is a serious medical condition that affects approximately 40 million people worldwide. If a person living with HIV lives without treatment, or with the incorrect treatment, the HI Virus can advance into AIDS – at which point the patient only has a few months left to live. The effects and progression of the HI Virus can be greatly alleviated with the help of antiretroviral treatments (ARTs). A proper course of ARTs that is taken correctly will immensely improve the quality of life of a person living with HIV.

Why deny an HIV positive person of a normal, long life when a solution is so easily achievable?

Often, the benefits of taking AR treatments are hindered when a patient does not follow the dosing instructions of their medicine due to the complexity of the medicine regime or simply due to everyday forgetfulness. Adherence rates for all medications on average are 39%, and adherence rates for AR treatments specifically can be as low as 50%.

By building a device to automatically dispense medicine, I see that this will benefit people who are affected by serious illnesses including but not limited to HIV/AIDS, Tuberculosis, and Alzheimer's. Furthermore, it will assist people who live a fast-paced lifestyle and are forgetful when it comes to remembering to take medication.



A ZIPPY BUSINESS ENTERPRISE! ST URSULA'S COLLEGE, QUEENSLAND

Year 10 girls at St Ursula's College, Toowoomba have been running successful businesses every term for a number of years through a Business Education subject, Enterprises and Ventures.

The Business curriculum incorporates the theme of entrepreneurship by offering Year 10 students the opportunity to run their own business for a term. Totally student-centred, the teacher employs each student from the first day of term to determine business ideas, conduct market research and produce the product/service. Profits are donated to a charity determined by the class. One of the main strengths of this unit is the hands-on approach available to all students in this real-life situation to satisfy a select target market of teenage girls and staff at the College. The assessment of student achievement is based on a written business plan, written evaluation of the successes of the business and personal reflection by students focusing on their strengths of entrepreneurial skills and their teamwork in all facets of the business.

One of our current Year 11 students, Kathryn Gough stated that right from the first lesson last year the students were kept thinking and acting. The term culminated in a donation of \$300 to TRAMS (supporting newly arrived refugees in Toowoomba). 'This business venture Unzipped, mimicked the challenges and elation of running a successful business. In nine weeks, our group of enterprising Year 10s generated an idea, conducted market research – and after successful feedback – began the design and production processes,' explained Kathryn.

Limited class time required careful organisation and many industrious hours outside of school to bring the product to life. 'We soon found that running a

business was more than just designing and producing a product; the talents of individual students were able to be channelled into the various, less obvious, facets of the business,' Kathryn said.

The positive results and experiences have encouraged many students to carry the venture beyond the bounds of the subject. This year Unzipped has continued to raise money for local charities. ▲

ANNETTE HARTLAND AND KATHRYN GOUGH
YEAR 11 STUDENTS

CODING FOR LIFE ST CATHERINE'S SCHOOL, NSW

In 2015 St Catherine's Waverley started 'Code St Cath's' to promote and assist students in learning to code. The goal is not to encourage every student to become a computer engineer but rather to better prepare and skill students for careers and workplaces of the future.

Code St Cath's meets every Friday at lunchtime and since starting the club has grown from ten girls to nineteen at the start of 2016. In 2015 twelve girls completed the Accelerated Computer Science program on code.org and eight girls completed Grok Learning's CodeComp, which trains students in Python, as well as the National Computer Science School competition.

In the first few sessions students are often seen standing in front of their computers physically checking which directions they want characters to move, showing that they are learning to process information clearly. Where much of the language we use in text messaging and emails carries with it assumptions about tone and humour, coding must be precise – much like writing a recipe, detail and clarity are required.

This year we hope to have at least ten girls complete the coding competitions on Grok Learning and for some students to start working on their own projects, developing their computational thinking and planning skills in order to develop a program.

A key aim of Code St Cath's is to develop the girls' skills for the future workforce. Learning different coding languages requires students to practise computational thinking and prepares them for careers across STEM areas such as engineering, user experience design, graphic design and web development.

A report by Eggleston and Jones (2014) states that 75 per cent of students who attended a one-week coding bootcamp reported finding a job that required their newly obtained skills post-graduation. This indicates that there is a demand for coding skills across industries. Coding bootcamp graduates also reported a 44 per cent increase in their salary after completion



of the course. There is an improvement in students' employability when they have coding skills. Even if students do not wish to seek careers in computer science, coding can improve their problem-solving and thinking skills, which in turn improves their employability in the future (Morrison 2013).

Students are learning in HTML, CSS and Python. While HTML and CSS are easily the least exciting programming languages they are very important to understand because almost all websites include some HTML and CSS. The girls learn the basics of page structure, fonts, colours and tables in order to structure a basic website.

Python is a far more interesting and dynamic programming language compared to HTML and CSS. It allows students to create user input with loops, variables, and strings in order to develop programs

and games. One of the creators of Python, Tim Peters, wrote *The Zen of Python*, a collection of the software principles that influence the design of Python programming language – perhaps coding can also teach us about communication and life in general!

The Zen of Python

Beautiful is better than ugly.
Explicit is better than implicit.
Simple is better than complex.
Complex is better than complicated.
Flat is better than nested.
Sparse is better than dense.
Readability counts.
Special cases aren't special enough to break the rules.
Although practicality beats purity.
Errors should never pass silently.
Unless explicitly silenced.
In the face of ambiguity, refuse the temptation to guess.
There should be one -- and preferably only one -- obvious way to do it.
Although that way may not be obvious at first unless you're Dutch.
Now is better than never.
Although never is often better than *right* now.
If the implementation is hard to explain, it's a bad idea.
If the implementation is easy to explain, it may be a good idea.
Namespaces are one honking great idea -- let's do more of those!

The girls who attend Code St Cath's are academically diverse but each benefits in her own way from learning to code. One student commented recently that she has found mathematics easier and has been achieving stronger results since she started coding. Girls gain confidence in their logical thinking processes as a result of learning to code. While it's yet to be clarified whether coding directly improves academic performance what can be confirmed is that the girls in Code St Cath's love it! ▲

DAISY TURNBULL BROWN
HISTORY TEACHER, ASSISTANT HEAD OF HUMANITIES,
TERTIARY ADVISER

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**HEARTS, MINDS AND HANDS:
ENCOURAGING ENTREPRENEURIAL MINDSETS
BRISBANE GIRLS GRAMMAR SCHOOL, QUEENSLAND**



we consider to be entrepreneurship's fundamental essence. Our ultimate goal is to inculcate this thinking progressively and seamlessly across the curriculum. Such an approach is a continuation of the mindset of optimism underscoring so much of our educational practice.

Professor David Rae (2012), leader, innovator and researcher in entrepreneurial learning, has identified seven basic skills underscoring an entrepreneurial mindset. They are:

Personality and social identity; Ambition, motivation and goals; Personal confidence and resilience; Self-discipline and personal organisation; Go beyond perceived limitations to achieve results; Tolerance of uncertainty, risk and failure; Personal value: ethical, social and environmental awareness.

These skills are not mysterious. They can be pivoted and re-tooled to reinforce an entrepreneurial mindset across the curriculum. Encouraging our young people to use their hearts, minds and hands to assess a problem and design an outcome is very achievable. Our role as educators is to continue to celebrate and reinforce such an approach. Young people can become skilled in seizing and creating opportunity. They can learn the importance of taking calculated risks, exploring and-and thinking while wrestling creatively with paradox. This is how we intend to encourage our young people to engage in entrepreneurial thinking with a sense of wonder, possibility and awe. ▲

DR BRUCE ADDISON
DEAN OF CURRICULUM AND SCHOLARSHIP

We live in a world of change. The velocity of this change is both awe-inspiring and disruptive. Givens are swept away with unrelenting frequency. Uncertainty continues to fill the void while the twenty-first century's fetish for immediacy grows unabated. The normalcy of 24 hour connectivity has altered our concept of what is important.

The shadow of this is the unrelenting banality of 'information'. Information bombards us consuming much, creating little while distorting reality – often without rationale or forethought. All of this occurs in tandem with technological ingenuity's ever growing reach. Wondrous possibility is awesome, providing potential emancipation from yesterday's impossibilities. The cost is that our social systems continue to be shaken to the core. As with all apparent binaries, they are nuanced, layered and far from simple. And-or thinking will not serve this era well. Binaries represent flawed thinking resulting in flawed outcomes. Our new frontier requires nothing short of and-and thinking and the ability to wrestle with paradox dynamically and comfortably (Malcolm, 2014).

All of this presents those who work with young people with a myriad of challenges. What can we do as educators to ensure that our young people are imbued with the requisite possibility thinking (Craft, 2005) to traverse this environment? Creating and seizing opportunity must by necessity become important mindsets for those wishing to succeed in a world characterised by such unrelenting fluidity. The verities of yesteryear are no longer. Work will continue to be 'hollowed out' and will continue to be fragmented (CEDA, 2015). The constancy of work as a conduit for a meaningful life will no longer remain a given. Creating opportunity amidst this fluidity and uncertainty will become a crucial mindset.

Those who have a knowledge of introductory economics will be aware of the four factors of production. They are: land, labour, capital and enterprise. So often enterprise is a presumed factor underlying the workings of modified-market economies. The reality is that twenty-first century living, will by its very nature, create a prominent role for enterprise and entrepreneurial thinking. At Brisbane Girls Grammar School, this is reflected in our new Strategic Plan. Under the pillar of Systematic Curiosity in Teaching, Learning and Research lies

the strategy: nurturing and celebrating creativity, entrepreneurial thinking with a sense of possibility, wonder and awe. Its genesis lay in the belief that our students must be imbued with a way of thinking enabling them to recognise and seize opportunity with poise, confidence and determination.

Former Wallaby, John Eales, when writing about entrepreneurial thinking notes the lesser known verse of Advance Australia Fair, calls for Australians to toil with their "hearts and hands". For true innovation of self, and if we are to reap the benefits, business and individuals alike must engage their minds, as well as their hearts and hands, for us all to innovate towards a better future (Eales, 2016, 25).

How are we conceptualising the creation of such an entrepreneurial mindset? Organisational theorist, Peter Drucker (1985; 143), when thinking about entrepreneurship notes that 'most of what you hear about entrepreneurship is all wrong. It's not magic. It's not mysterious; and it has nothing to do with genes. It's a discipline and, like any discipline it can be learned.' While traditional curriculum models associated with business studies type approaches remain important, our approach has been to commence discussions aimed at distilling what



EXPLORING ART AND MUSIC OF THE PACIFIC RIM WESTLAKE GIRLS HIGH SCHOOL NEW ZEALAND

Art and Music of the Pacific Rim is a collaborative Art and Music Department course for Year 9 Westlake Girls students. Introduced this year, the course explores cultures and traditions of the South Pacific and local resources have proved invaluable. Auckland Museum's Ipu Moana Workshop (Music and Dance) and a traditional Tapa workshop (with two Tongan Artists Tui Gillies and Sulieti Fieme'a Burrows) enabled students to develop performances integrating vocal ensemble skills, Samoan dance and Pacific inspired wearable art. Exposure to people, places and participation has motivated and inspired students to develop confidence and self-esteem, as they discuss, explore and share ideas.

So what's next? Students produce a site-specific sculpture with sound, focused on Maori myths and legends. A visit to Kaipara Sculpture Gardens aims to inspire student creativity while providing insight into

scale, the diverse use of materials and the impact artistic outcomes could have. Exposure to Maori music, culture and language should also strengthen student understanding about Aotearoa New Zealand.

Exploring Micronesia, Melanesia and Polynesia later in the year includes Indonesian Shadow Puppet Theatre. In groups, students will explore percussive textures of the Gamelan Orchestra while shadow puppets tell an Indonesian story selected by students. Art and Music of the Pacific Rim ensures students are active enquirers and ethnomusicologists, discovering non-Western art forms from neighbouring countries. Through Art and Music disciplines students can expect to develop greater confidence researching, exploring and expressing ideas. ▲

NICOLA OV & FIONA WILSON
ART AND MUSIC DEPARTMENTS



THE LITTLE GREY CAT AND THE SHINY RED BALLOON WESTLAKE GIRLS HIGH SCHOOL NEW ZEALAND

There once lived a little grey cat, as happy as can be, sitting on a windowsill, looking out at a tree. This fellow sparked the beginnings of our entrepreneurial adventure: publishing a picture book, *The Little Grey Cat and the Shiny Red Balloon*, under the Lion Foundation Young Enterprise Scheme. Over the course of two years we have been challenged to set up a company at Westlake Girls High School and create a product for the commercial market. In doing so we have learnt that you must take risks and have faith in what you do. Believing that our book had the ability to teach the values of friendship, freedom and joy, while also fundraising for the SPCA with every book sold, was pertinent to our success.

Plutonium has continuously grown as a company and we have taken pride in becoming an inspiration to others. Unexpectedly, our product led to many special experiences for us, such as being asked to discuss the process of writing and illustrating at Bayswater Primary during Book Week. Seeing the students' faces

in awe really made us realise that we do not only profit financially but also from the joy and admiration that we evoke in others.

Due to the success of our innovative video pitch on YouTube, entitled 'Introducing *The Little Grey Cat and the Shiny Red Balloon*', the Young Enterprise Scheme further recognised our entrepreneurial spirit by awarding our company the Sales and Marketing Award. The video has attracted hundreds of views and accompanied by our website (<http://thelittlegreycat.co.nz>), our entrepreneurial initiative across social media platforms is evident.

The Lion Foundation Young Enterprise Scheme has provided great insight into the world of business and truly is a life-changing extracurricular activity for students to become involved in. If you would like to hear more about our venture and experiences with entrepreneurship or are interested in purchasing a copy of *The Little Grey Cat and the Shiny Red Balloon*, feel free to contact us at plutonium.yes@gmail.com, via our website or Facebook page. Encourage your students to take a chance. Be innovative and dynamic leaders. Embrace entrepreneurship. And with a swish of his tail the cat was on his way, oh so very happy that he'd made another's day. ▲

PLUTONIUM:
KK MAK
CATERINA BARTON
ESTELLA ARABI
SHERIN JACOB



VIEW THE YOUTUBE CLIP THAT WON PLUTONIUM THE SALES AND MARKETING AWARD:
WWW.YOUTUBE.COM/WATCH?V=PCI6OXUORBE OR SCAN THE QR CODE WITH YOUR SMARTPHONE

(ABOVE) WESTLAKE'S TOP YOUNG ENTERPRISE COMPANY OF 2015 (L-R) KK MAK, CATERINA BARTON, ESTELLA ARABI, SHERIN JACOB

THE IMPORTANCE OF AN ENTERPRISING MINDSET

MENTONE GIRLS' GRAMMAR SCHOOL, VIC

At Mentone Girls' Grammar we live and breathe enterprise! It is a strategic priority at our School and one of our WAVES (Wellbeing, Achievement, Values, Enterprise, Success) principles that drive the way we meet the particular learning needs of girls.

Our unique style of education provides an environment which explicitly aims to develop an enterprising mindset and prepare girls for the complexity of the 'here and now'. But more than that, we are preparing them for a future with jobs and technologies that have not yet been invented, to solve as yet unknown problems. With enhancements in health and technology, the life-span of our youngest students today will be nudging the twenty-second century. If young people are going to manage and thrive in such a complex world, we must empower them with the skills and 'can-do' attitudes that will enable them to flourish and to create their own definition of success.

To achieve this, we have developed the Mentone Girls' Grammar Enterprise Academy, which is designed for experiential learning and creative development. The Academy has been a virtual incubator for ideas for some time, however it will become a physical reality in 2016.

For us, authentic enterprise education is much more than business studies or entrepreneurship. In addition to these possibilities, enterprise education actively encourages the convergence of innovation, creativity, empathy, intercultural understanding, intelligent risk taking, resilience, a can-do attitude and the drive and determination to make ideas of value happen. It is measured, not by job or wealth creation, but by its impact on personal development and the growth of ethical, confident young women who can facilitate their own success, whether that is running their own business or positively impacting the communities they serve, the employers they work for, or their own professional and personal prospects. They learn the 'language' of enterprise along the way; terms like 'social entrepreneurship', 'design thinking', 'financial sustainability' and 'customer validation'. The Mentone Girls' Grammar Enterprise Academy is about harnessing this enterprising culture, making the boundaries between classroom, industry, individual agency and real-world thinking more porous, right now with collaborative, hands-on, experiential teaching and learning.

Enterprise is an intrinsic part of the Mentone Girls' Grammar curriculum and something that is fostered from a young age. In Year 1 students participate in the School's highly acclaimed program on financial literacy exploring essential skills for young people to learn in order to set them up for a more secure future in a

globalised economy. Another key aspect is about social enterprise and using customised 'Tri-Fi' money boxes to promote the concepts of spending, saving and giving. The girls are encouraged to share their money across the three areas, they set financial goals and learn how to work towards achieving them. This has generated extensive conversation at school and home about how to earn money in the home environment – importantly, what constitutes a 'love' job and what constitutes a 'paid' job. The girls are learning that being part of a family comes with responsibilities such as cleaning their own room, but there is also opportunity to be enterprising and to support others in a sustainable way.

Students also have the opportunity to participate in our Junior Enterprise program for Years 2 – 5 where they work on specific enterprising skills and attributes through practical projects. Students are actively



introduced to the concept of invention and approach complex problems in innovative and rigorous ways to identify and solve real-world problems.

From Years 5–12, students then have the opportunity to expand the skills they have learned and apply for one of the School's prestigious Enterprise Awards. These competitive annual awards, that see students pitching their ideas to a panel of judges, provide seed funding to help make their enterprising ideas a reality.

Head of Careers and Enterprise, Kelly Jedd, says the Awards support students who are working on a range of enterprise projects. "We encourage and support our students to follow their passions and put their ideas into action. We run workshops throughout the year to provide them with learning opportunities, practical skills, industry contacts and insight into a variety of areas to help make their enterprising ventures a success."

In the past few years, the School has seen students achieving success through outstanding enterprise projects.

Through her Enterprise Award, Genevieve Phelan (Year 12) has been able to expand her beauty blog,

'Editor in the Making', which currently has over 15,000 views. Genevieve purchased a quality tripod to provide more professional photography and video for her blog and developing YouTube channel. She also completed a 'Paparazzi Ready' Napoleon Perdis Makeup course to extend her makeup artistry skills. She has offered her services to friends, family and other clients in the community which includes doing stage make up for the Mentone Girls' Grammar stage production of *Mulan Jr.*

Genevieve says that the Enterprise Award experience has taught her to never give up, dream big and have a go at whatever it is you love. "The amazing mentors that spoke at our enterprise workshops gave real insight into the entrepreneurial industry and were definitely inspiring to listen to. My social media and communication skills have grown throughout this experience. I'm very excited to be weaving enterprise into our *Spindrift* magazine as editor this year as there



are so many exciting things going on in this space across the School."

For the past few years, Maddisyn Dixon-Whitbourne (Year 8) has been focussed on her social enterprise 'wearable art' project. Maddisyn began printing photographs and artwork onto t-shirts to sell at local markets. She achieved some fantastic success and began to investigate ways she could grow her business. Last Father's Day, she worked with the Prep students to draw a picture of their dads, and printed them onto t-shirts as gifts. Maddisyn supports the charity SASI (Statewide Autistic Services Inc), and has donated a large percentage of her profits to this worthy organisation, while still investing in her business to ensure its sustainability longer term. This year Maddisyn hopes to grow her business and raise more funds to support SASI. She is contacting local primary schools inviting them to be involved in her Father's Day t-shirts charity drive.

Year 11 student, Anagha Raviprasad has been using her Enterprise Award this year to publish an e-book for the teen market. Anagha has written the first novel in her planned trilogy, and is learning about how to get her book published online.

IT-savvy Nikki Dulberg (Year 6) is working on developing 'Math Zoo' a maths blog for primary school children. Nikki loves maths and is committed to using her advanced knowledge of maths and IT to help her peers to learn.

As a MoneySmart school, Mentone Girls' Grammar is focussed on developing financially literate young women. Year 6 student, Grace Lewis, is passionate about this area and is developing a financial literacy website named 'Mini Money Matters' aimed at primary school students to learn about finance, savings and managing their money and bank accounts.

Our Enterprise culture also provides a fertile environment for teachers to be great role-models in this area as well, and this is actively supported through staff Enterprise Awards. These are open to academic staff who are encouraged to take a risk and pitch an idea that challenges traditional teaching methods or curriculum design to develop cutting edge practices. Since 2014, teachers have been flexing their enterprising muscle and our students have benefitted. Projects have ranged from Year 1 teacher Leah Opie creating a unique spelling curriculum for Prep – Year 6 that more explicitly links spelling to meaning; creative collaboration from Senior School teachers Catherine Freney and Lyndal Phillips on developing resilience in students to support the School's priority on Wellbeing; to the 2016 project by eLearning Manager, Michelle Dennis and Geography teacher,

Julia Armstrong, who are looking at how emerging technologies like virtual reality can be used to enhance the curriculum, with a particular focus on girls' needs.

Michelle says, "Research has established that, compared to boys, girls can have underdeveloped spatial skills; these skills are important because they are predictors to performance in both maths and science. Julia and I are working collaboratively to use virtual reality headsets to explore mapping in Geography. By taking the abstract idea of contour maps and going through the process of interpreting this into 3D space, our aim is for the girls to develop higher order spatial skills, exercising both mental rotation and spatial visualization. This exciting project shows the power of collaboration with technology and could not happen without the School's commitment to enterprise."

In every classroom from science and maths, to technology, art, music and sport, Mentone students are developing enterprising skills and attributes that will see them lead the next generation of entrepreneurs, thought leaders and idea creators, capable of understanding the complex issues facing humanity and the ability to think outside the square to solve them. ▲

FRAN REDDAN, PRINCIPAL



STUDENTS STEP UP IN SCHOOL SUBMARINE CHALLENGE

ST PETER'S GIRLS' SCHOOL, SA

Four students from St Peter's Girls' School in Adelaide recently broke new ground in the field of engineering – building their entrepreneurial attitudes in the process.

Research has shown that the participation rates of girls in STEM (Science, Technology, Engineering and Mathematics) subjects remains at a worryingly low level. Statistics indicate that these participation levels rise significantly for those girls educated in an all-girls environment but even so, it is puzzling to see the imbalance between the number of girls who show enormous interest in the health sciences rather than the physical and technological sciences. While many of our girls aim to study medicine, few are looking to become physicists or engineers.

STEM areas naturally offer students the opportunity to engage in the digital and literacy skills of the future – developing their natural curiosity as well as passion for problem solving and innovation. Ultimately, action learning opportunities in this area help in building the entrepreneurs of tomorrow.

To ignite better interest in the engineering field, St Peter's Girls has been part of the pilot program of

SUBS in Schools. The 'Future Submarine Technology Challenge', founded by Re-Engineering Australia in association with the Defence Materiel Organisation (DMO) and a number of industry stakeholders, sets a challenge to participating teams: build a remote-controlled model submarine.

Six schools from across Australia took part in the pilot program, with the national finals recently wrapping up in Penrith, Sydney. The team from St Peter's Girls, Athena, took top honours at the finals, being named overall winner of the competition, after taking out four of five individual categories.

The students, who completed the majority of the work during Year 10, are now in Year 11 and contemplating future careers in STEM fields. While the results are truly impressive, the program has delivered much more than a prototype submarine, supporting documentation, a few medals and a hefty trophy.

The SUBS in Schools curriculum

The SUBS program involves students working as a team to complete a series of tasks, culminating in a series of presentations and practical assessments. The program is very much a hands-on, action learning experience. Since starting the project in Semester 2, 2014, the girls have been required to establish a virtual company to complete the design project, manage the manufacturing process and present and market the final submarine prototype.

Each of the four students took on one area of



responsibility, from designing the concept, building the prototype, managing the marketing of their company and leading the team. While building the prototype was a challenging component in itself, the students also needed to produce a portfolio and present on their virtual company, how it is marketed and the design process used. The submarine was then also put through a series of tests in the water to evaluate their design.

Throughout the program, the girls delved deep into the inner workings of a submarine, to investigate the impact of hydro-dynamics and other forces on the design, as well as understanding energy generation, storage and usage methods. Importantly the project also assisted our girls in developing their spatial skills – essential for success in engineering. This is a great example of 'contextualised learning' – allowing the girls to apply their school knowledge in a real-life context and providing an opportunity for them to share their work with audiences beyond the classroom and school.

Industry engagement

Re-Engineering Australia is proudly supported by Defence Materiel Organisation, ASC, SAAB and other leading organisations. A key component of the SUBS in Schools program is a mentoring opportunity with engineers and experts from the industry.

Through the program, SAAB partnered with St Peter's Girls to provide ongoing support. Our students worked with graduate engineers and experts to learn about the technology found in submarines, unravel the skills required to build a working prototype and problem solve their design to produce the best result.

Students learnt about buoyancy, mechanics and electronics, construction techniques and mechanical assembly, while also discovering the tools and concepts of project management, marketing, risk and return on investment. They used programs such as AutoDesk 3D Inventor, Makerbot 3D-Printing and Adobe Illustrator and InDesign.

Throughout the project, the girls were fortunate to meet and speak with representatives from a variety of industry-leading organisations and it is these experiences that have left the girls most inspired for a future career in engineering.

Entrepreneurship

The SUBS in Schools program developed the entrepreneurial skills and attitudes of the girls. For example, they became more self-reliant, proactive and innovative and their perseverance increased throughout the project. One perspective on Entrepreneurial Education in the OECD background paper *Entrepreneurship in Education; What, Why, When and How* (Lackeus, 2015) involves the impact of emotional demands of activities on students' development of entrepreneurial attitudes.

The challenge of having to develop and market a product, for which they relied on interaction with the 'outside world', placed several demands on the students' emotions. At times, the success gained as a result of the mentoring provided by the SAAB Australia engineers led to happiness and the motivation to continue exploring. At other times, the need to understand the complex concepts and skills required in these mentoring sessions led to feelings of frustration. Likewise, the girls needed to obtain sponsorship (often in the form of products or services) from external organisations and businesses to complete various tasks. Some of their attempts to obtain sponsorship were more successful than others, and the girls learnt a lot about resilience. The positive outcomes of this experience were an increased tolerance of uncertainty, willingness to take risks and perseverance to overcome difficulties.

The positive reinforcement that they received from external sources through SAAB Australia and their competition success has enabled them to develop the understanding that they can succeed in this type of challenge, that they want to continue to be involved in this kind of activity and that being entrepreneurial is now part of their identity.

The benefits to the students of participation in this program stretch from increased awareness of the opportunities provided by engineering to highly developed entrepreneurial skills and attitudes. They will carry these skills and attitudes with them in their future pursuits. ▲

BRIAN PARSONS, HEAD OF SCIENCE

REFERENCES:

Lackeus, M. (2015). *Entrepreneurship in education: what, why, when, how*. OECD.

IONA GIRLS MAKE A DIFFERENCE IONA PRESENTATION COLLEGE, WA

As part of Iona Presentation College's commitment to STEM focus (Science, Technology, Engineering, and Mathematics), students are supported in their development of skills in cross-disciplinary critical and creative thinking, problem solving and digital technologies, which are essential in all twenty-first century occupations.

Students across all year levels are engaging in learning programs and activities aimed to increase their interest in STEM related fields, while improving problem-solving and critical analysis skills, giving them foundations which enable them to engage with, and succeed in, the world beyond the school gate.

Within the curriculum Iona girls engage in all areas of STEM. Challenge Science offers Years 9 and 10 students the opportunity to study many facets of the science curriculum not otherwise covered comprehensively in the core science classes. In these classes the girls engage in coding through robotics, construction and programming, engineering studies leading to 3D printing, and engineering and astronomy mentoring through programs with Western Australian universities. Epigenetics is a new branch of genetics that the girls are also studying.

Though the Year 8 elective, ILSA, girls are introduced to 3D Computer Aided Design (CAD), animation technologies, and the study and application of nanotechnology. Social physics, a relatively new branch of science will become part of this course next year.

As part of Iona's co-curricular program students participate in many mathematical opportunities including The Australian Mathematics Trust Challenge, Enrichment and Olympiad competitions, with Computational Algorithmic Thinking competition being new this year. Mathematics Mentor engages girls in unique and challenging mathematical problems and stretches beyond the Year 12 level of mathematics, while younger students are extended in their use of the Classpad. Students have the chance to be involved in the da Vinci Decathlon, the Innovation festival, the Australian National Chemistry Competition, Big Science Competition and the National Youth Science Forum.

The fostering of entrepreneurial skills was evident in the Year 9 Challenge Science class during Terms 3 and 4 in 2015 which had a focus on engineering. Pulling apart machinery, building structures using the 3D printer and creating geodomes were all aspects of the course, which culminated in participation in an engineering essay competition.

The Engineering WA state-wide essay competition required students from Years 8 to 10 to write about a form of transportation and cover

STUDENTS ACROSS ALL YEAR LEVELS ARE ENGAGING IN LEARNING PROGRAMS AND ACTIVITIES AIMED TO INCREASE THEIR INTEREST IN STEM RELATED FIELDS, WHILE IMPROVING PROBLEM-SOLVING AND CRITICAL ANALYSIS SKILLS, GIVING THEM FOUNDATIONS WHICH ENABLE THEM TO ENGAGE WITH, AND SUCCEED IN, THE WORLD BEYOND THE SCHOOL GATE.

aspects of engineering from the past, present and future. This called for the girls to not only research the past, but creatively propose future directions in their chosen topic.

All our Year 9 Challenge Science students wrote essays of an excellent standard, as deemed by the judges. Most pleasing was that the top three places in the state were awarded to Iona Presentation College students.

An initiative for all Year 8 students at Iona Presentation College is to complete a self-directed learning program by creating a project reflecting principles of sustainability, known as 'The Rich Task'.

Alexandra Prichard (13), however, has taken her task from last year one step further. As part of this project she began developing a smartphone application, "girlgonehappy", providing information and resources on mental health, targeted towards teenage girls.

"I created this application to break down social stigmas surrounding mental health and to promote a healthy, happy, and sustainable lifestyle for teenagers. I wanted to raise awareness of mental health and its importance in everyday life, especially during the teenage years. I also wanted to influence and encourage positive decision making in teenage girls regarding mental health and wellbeing," she said.

Alexandra has recently finished production of her app and has uploaded "girlgonehappy" to the iTunes store, and it can be sourced on iOS Apple devices.

Mentor teacher for Alexandra's project, Miss Gemma Beekink, said Alexandra was to be commended for not only thinking outside the square when it came to sustainability, but also that she took initiative and continued her project long after the school deadline.

"As her mentor, I saw first hand how great her idea and vision was, so it's wonderful to see a student take the Rich Task to the next level and try to make a difference in the wider community."

Alexandra has been featured in two local papers and a national teenage girls' magazine, and has also been interviewed by Channel 7 News regarding her ingenious application.

These are just two examples of how Iona girls make a difference. ▲

CATHY BROAD
TEAM LEADER, COMMUNITY RELATIONS AND DEVELOPMENT



(ABOVE) ALEXANDRA PRICHARD APP DEVELOPER

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2016 EVENTS

- > **28 – 29 APRIL / AUCKLAND NZ**
Girls for Change Leadership Summit
Westlake Girls High School

- > **11 MAY / VICTORIA**
Twilight Networking Event
Lauriston Girls' School

- > **12 MAY / TASMANIA**
Annual Dinner
St Michael's Collegiate School

- > **22 – 24 MAY / QUEENSLAND**
Real Girls Real Women
Biennial Educators Conference
Rydges Hotel South Brisbane

- > **23 MAY / QUEENSLAND**
Alliance AGM
Rydges Hotel South Brisbane

- > **20 JUNE / SOUTH AUSTRALIA**
Dr Peta Stapleton,
Clinical and Health Psychologist
St Peter's Girls' School

- > **28 JULY / VICTORIA**
Twilight Networking Event
Genazzano FJC College

- > **30 JULY – 4 AUGUST / LOCKHART RIVER**
Yarning Up
Hosted by Bond University

- > **2 AUGUST / NEW SOUTH WALES**
Dinner Networking Event
Abbotsleigh

- > **4 AUGUST / TASMANIA**
Parliamentary Morning Tea
Parliament House, Hobart

- > **17 AUGUST / VICTORIA**
Science Breakfast

- > **24 AUGUST / WESTERN AUSTRALIA**
Years 9 & 10 Breakfast
Methodist Ladies' College

- > **1 SEPTEMBER / QUEENSLAND**
Twilight Networking Event
St Margaret's Anglican Girls' School

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Keynote presentation
Elizabeth Broderick AO, Australia's longest serving Sex Discrimination Commissioner and 2016 NSW Australian of the Year



Single-sex classes: Do they affect economic outcomes?
Alison Booth, Professor of Economics and ANU Policy Fellow
Australian National University



Navigating CEO appointments – Do top male and female CEOs differ in how they made it to the top?
Terry Fitzsimmons, University of Queensland Business School



Generation Z defined: The 5 key factors of this global generation
Claire Madden, Social researcher, media commentator, and founder and director of Hello Clarity



Women, work and a problem that needs to be resolved
Georgina Dent, Editor at Mamamia, journalist and commentator



Patterned perceptions: Discoveries between art, science and Indigenous cultures
Rebecca Karmen, Artist and Professor Emeritus at Northern Virginia Community College

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