Sabbatical Report
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How do we ensure we are offering a curriculum that is challenging & future focussed?

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Period of Sabbatical
3 June to 5 July 2019
28 August to 27 September 2019

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Executive Summary

During my sabbatical, I was keen to explore how schools in the United States are encouraging STEM education for young women; and also how they are developing effective school tertiary and school-business partnerships to help students transfer the knowledge they learn at school into real life situations.

At the 2019 Global Education Leaders Partnership (GELP) conference one of the emerging themes was the need to shift "learning from memorization to elaboration and to problem solving strategies" (2019, GELP).

To make this theme a reality, I feel there is a need to explore more opportunities for problem solving activities at Baradene College which incorporate opportunities to further develop students' collaborative and communication skills.

Universities and schools are setting up "makerspaces" to give students the opportunity to explore project based learning. A makerspace can be any space in a school where students and teachers come together to create, invent, prototype, design, tinker, explore, discover, code, build, craft, draft, draw etc. Students can work individually or collaboratively using a variety of high and low-tech tools and materials.

As our school has a relatively large student body, I was interested in learning how we could make this work. From what I observed, the best way of doing this was by creating a space that can be "booked", in much the same way our school libraries are booked. It is important that these makerspaces with technical equipment are well supervised and materials are replenished regularly. To do this effectively would require a specialist facilitator.

For the other aspect of my sabbatical, I was interested to explore the place of oral communication training in schools. School21 in London is recognised in the United Kingdom for a whole-school culture of oracy. I believe that it is so important that students have the ability to speak well in public. Unfortunately, my visit to this school was cancelled at the last minute. We have begun an oral communication programme at

Baradene and will look for further opportunities to extend public speaking opportunities for the students.

Employers are looking to recruit people who are effective at communicating in public.

The third educational theme I explored was to see how schools were forming partnerships with business and with tertiary organisations in order to prepare students for a future of work; and to facilitate transitions to these organisations.

The schools I visited did this in different ways, but all reported the advantage of workplace learning experiences, through internships, visits and research in conjunction with these organisations.

Purpose

To ensure Baradene has a future-focussed curriculum by researching best practice in schools, in STEM education in the United States of America (USA) and United Kingdom (UK), and ways of enhancing Oracy development in the UK. To research school-tertiary and school-business partnerships by visiting schools involved in these partnerships in the USA and UK. To attend the National Coalition of Girls Schools Conference in Los Angeles.

One of the biggest challenges for school leaders today is to ensure we are offering a curriculum that is challenging and future-focussed.

The purpose of my sabbatical was to provide time for me to research what is happening in the USA and the UK to prepare students for the future.

This involved visiting schools, attending a conference and researching articles. I hoped to gain ideas which I could bring back to develop at our school in New Zealand.

On my last sabbatical, I researched the effectiveness of the anti-bulllying programme KiVa in Finnish schools and have implemented the programme at Baradene. We have

also shared our programme with other schools and have spoken about it in the media (Radionz interview with Catherine Ryan and TV3 programme "Project").
In particular I looked at three aspects:

1. Best practice in STEM education is particularly to encourage more young women into STEM careers in the future.
"In New Zealand only 28% of STEM roles in the community are held by women. Women make up 64% of people studying for a Bachelor of Science degree, with the majority of those in health subjects, with less than a quarter studying engineering and just over a third working towards a qualification in information and communications technology (ICT)". (Careers NZ)

2. I was also interested in researching what schools do to encourage oracy development in their students. An important skill for our students is the ability to express themselves fluently and persuasively.

A report in the "Independent", a UK newspaper, says research confirms "that the Alumni of British Public Schools still control politics and many top professions. One reason these people are so successful in public life is that they are commonly very confident, fluent public speakers".

We want the students leaving Baradene College to have the skill of being able to express their ideas in public forums, and so to have influence in our local and global community in the future. Employers want to recruit people who are effective public communicators.

3. The third purpose of my sabbatical was to research school-tertiary and school-business partnerships to assess the merits of these partnerships to enhance what we do in schools and so prepare the students for the future world of work. This would also facilitate the transition from school to tertiary organisations and work placements.

Rationale and Background Information

"By 2030 Automation, Globalisation and flexibility will change what we do in every job. We urgently need to prepare young people with the work smart skills they will need most". (2017, "The New Work Smarts – Foundation for Young Australia")

With the rate of change facilitated by technology advances, it is important we continue to look at how best to prepare our students for the future, and change and adapt our practices as well.

In a recent article in the Sunday Star Times reporting results of a survey of New Zealand Accountants, "88 per cent of respondents listed emotional intelligence, communication, and interpersonal skills as the most important skillset for the next five years, with adaptability and agility following closely behind at 85 per cent".

In the UK there has been a rise in private schools offering Btecs (Business and Technology Education Council). These are work-related qualifications taken as an alternative to GCSEs and A levels. They are designed for young people interested in a particular industry or sector. They can be studied as part of an apprenticeship or alongside academic qualifications. It is interesting that all universities accept these qualifications with the exception of the Imperial College London. Cambridge, Oxford and University College of London accept these qualifications when combined with other qualifications. (The Times, August 24, 2019). This is an effort to ensure that these private schools are offering courses that suit their students' interest and are focussed on future employment opportunities.

In a recent CBI (2018) report, nearly 74 per cent of businesses said they prefer their employees to have a mixture of academic and technical qualifications or they view all qualifications equally. This report also states the importance of partnerships between schools or universities with businesses to raise levels of achievement and smooth transition to work.

According to Otto Scharmer, a senior lecturer at Massachusetts Institute of Technology, “action learning” has taken the place of abstract thinking, inverting the traditional teacher-student relationship. “Traditional educational relationships focus on explaining (by the teacher) and listening (by the student). In action learning the student is the change agent or entrepreneur, and the teacher is the coach, the helper who holds the space for the learner to activate her highest future potential. Developing action learning at scale requires very different learning infrastructures, including classrooms that are not primarily about content delivery but about reflection on action, which requires a different type of faculty that can hold the space for student-centric forms of learning”.

Schools are looking at how they provide this “action learning”. Makerspaces are areas in schools where students can work on projects and apply their knowledge through actions. I was keen to see how this “action learning” could be achieved in a practical way that fostered STEM learning in our students.

Methodology

The methodology that I followed for this sabbatical included:

- Visiting eight schools – seven in USA and one in Scotland. Seven of the schools were sister schools to Baradene (owned by the same religious order). All but one of those sister schools were private. A school I visited in Philadelphia was a state school.

- Attending the National Coalition of Girls’ Schools Conference in Los Angeles. This conference had a focus on STEM education.

- Researching and reflecting on information regarding what employers are looking for in future employees and what skills, values and attributes are needed to be successful members of society, now and into the future.

Findings

Science Leadership Academy – Philadelphia

I visited this school because I was interested in how the school was set up. "Authentic Learning in the Digital Age" by Larissa Pahomov had a foreward written by Chris Lehmann, the Principal of this inquiry-driven, project-based high school.

This school has underlining core values that drive what was happening in the school: Inquiry, Research, Collaboration, Presentation and Reflection.

Enrolment into the school was not open, but instead determined by an interview that asked the student to bring along a project he or she had created.

The school did stream for Mathematics and Languages, but had mixed-ability classes for English, History and Science.

When I asked about foundation knowledge needed, it appeared as though this knowledge was taught through projects undertaken in the different curriculum areas. These projects were not as cross-curricular in nature as I had expected. Their subject based approach seemed to be a better way of developing project-based learning.

The school has a close association with the Franklin Institute which is a science museum and the centre of science education and research in Philadelphia. Students of the school have mini courses at the Franklin Institute as freshmen and are interns in sophomore and senior years.

The other aspect of the school I found interesting was that the senior students were employed as assistant teachers for the lower level classes.

Convent of the Sacred Heart – New York

We discussed the Advanced Programme (AP) programmes that this school offers for their able students. These are advanced programmes from a curriculum that is set by the College Board of the United States. If students are successful in the Advanced

Programmes they gain credits towards University (College) degrees. It was interesting that they were the equivalent of Stage 1 Units at New Zealand Universities. This would challenge the able students by allowing them to gain credits while at high school.

Convent of the Sacred Heart Greenwich

Students at this school undertake science research projects in their senior year in association with Universities. They collaborate on research with the Universities. This means the students have a pathway established to the University which gives them an advantage for enrolment.

Josephium Academy of Chicago

Josephium had an internship programme where the students were interned in different organisations around the city (in their summer break), to get an idea of different careers. The school was also looking at including in their senior International Baccalaureate programme work that would give students credits towards their College degrees. This seems to be an ongoing theme in the United States - sitting some university papers at school or getting credits for university work at school. This assists the students in getting a head-start and making it a lot cheaper ultimately for the students; and shortens the time to finish their degrees.

Sacred Heart Atherton

A new building development at this school had a centre for project-based learning that included the following subjects: Technology, Art, Media and Science. The area was staffed by a specialist teacher who had responsibility for assisting students with their projects and overseeing equipment and supplies.

National Coalition of Girls' Schools Conference

The following were ideas that I thought were interesting:

- Some schools have courses in Artificial Intelligence (AI)
- Media opportunities added to makerspaces are worthwhile
- Creating presentations important - clearly communicate ideas
- Games help in teaching financial literacy
- Kate Bowan, who led the development of an algorithm for imaging black holes, said 3 things made the difference for her:
    1. Learning how to learn
    2. Engage a mentor
    3. Be purposeful – focussed and wanting to make a difference
- Important that students learn to be comfortable with failure if we are to encourage entrepreneurs. Five important skills of successful entrepreneurs:
    1. Intellectual curiosity
    2. Ambition
    3. Resourcefulness
    4. Empathy
    5. Stewardship – can influence for good
- Kimberley Abbott – Social impact innovation – YouTube clip.
- Sheryl Sandburg – TED Talk – Agility
- Success comes when students have confidence, are a member of a community and find work meaningful
- Need to give students the opportunity to pursue something they don't know the answer to
- Ncwit.org – free resources National Centre for Woman and Information Technology (ncwit)
- Teachers post lessons on the staff shared drive and invite other teachers to observe

Implications

My findings suggest there is an impetus for schools to continue to be institutions not only where knowledge is gained, but must also be places where, through collaboration, knowledge is applied to problem solving and critical thinking about issues. To do this we need to offer project-based and real-world learning experiences, that as well as in the classroom go beyond the classroom environment, such as working with local businesses and tertiary institutions.

In the USA, the Honors Programme for senior students matches senior students with University mentors to research and develop different projects. One such research project I saw was "Working Memory and Affective Psychology: Subjective Happiness as a Predictor for Cognitive Decline Among the Elderly". There was a considerable benefit to the students involved; and in most cases the project was instrumental in their moving into second year courses at University when they left school.

For schools to organise students to work with outside providers and universities will require considerable resourcing, but there is no doubt as to the benefits of providing these opportunities for students. This work could be undertaken in holiday breaks. It does however raise the question of equity, because many students might currently use the holiday period to raise money for further education.

Many schools I visited had makerspaces that were areas to facilitate project-based learning within the school that were accessible to all curriculum faculties. These areas involved technology equipment, communication areas for presentation (TV studios), computers for graphic presentation, science laboratories and art rooms.

For New Zealand schools to move towards having these faculties grouped together and accessible to all curriculum areas will require considerable resourcing. The best examples I saw was when there was one person in charge of the area with no teaching responsibilities. The area could be booked by different curriculum areas - in the same way libraries can be booked currently in New Zealand schools.

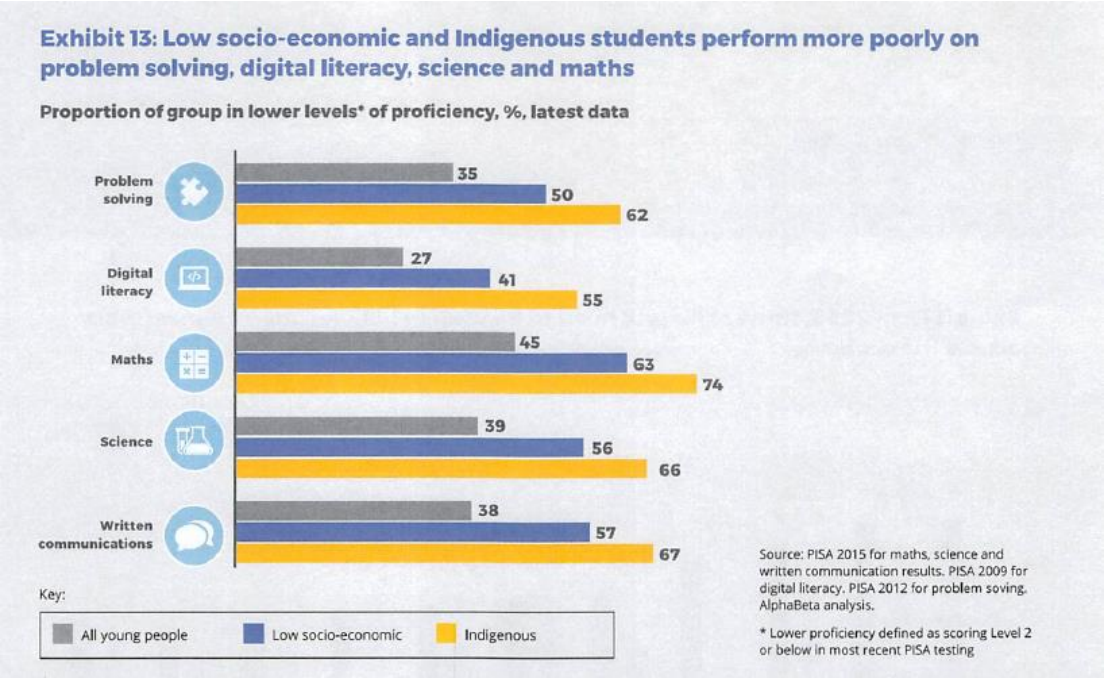
Conclusions

The further development of globalisation of the workplace, the increasing use of automation and artificial intelligence will mean that thinking and interpersonal skills will take on a greater focus in the future world of work.

Wages will be higher for young job seekers with enterprise skills: Creativity, Financial Literacy, Problem Solving & Critical Thinking, Digital Literacy and Presentation Skills.

There is also a responsibility to educate our students to be agile and able to cope with the rapid change accelerated by advances in technology.

With these changes, comes an equity challenge. PISA results show us that low socio-economic and indigenous students don't perform as well in Problem Solving, Digital Literacy, Science and Maths. Below is a bar graph showing these results.



Students with lack of skills will have to take employment in jobs that are likely to become disproportionately hurt by automation. Technology intensifies the globalisation of labour. The rise of the virtual global worker means that lower-skilled workers will have to compete for their jobs with not only people in their own country, but against people

that can do these jobs globally. It is important that we have students leaving schools in New Zealand with proficient skills in Problem Solving, Digital Literacy, Mathematics, Science and Presentation.

To summarise, what I have learnt is:

- ensuring the students who leave our school do so highly skilled in the attributes needed for the future
- knowledge is important - university degrees are still valued but they are enhanced with enterprise skills (problem-solving, communication, financial literacy, critical thinking, creativity, teamwork, digital literacy and presentation skills)
- the importance of students following their passion if not interested in further academia and these students working with industry partners while at school, ensuring a smooth transition to work that fulfils them
- "action learning" is important - be this project-based learning or through internships and collaborating with business and tertiary organisations
- the importance of teaching students to be agile – able to embrace change
- educating about globalisation - the benefits and responsibilities of being global citizens
- the importance of teaching the values of democracy, inclusion, equity, empathy and compassion
- the importance of teaching skills in oral communication so students can communicate ideas effectively in all aspects of life

I think the GELP report "Anticipating the Future" sums up what our education system needs to focus on:

"The current and future worlds need people who can thrive in the 21st century: become happy and satisfied local and global citizens. People who contribute, who are responsible, adaptive and pro-active-socially, economically and environmentally;

people who are excellent not only academically, in traditional knowledge and skills, but also in human, personal, interpersonal, intercultural aspects of the ‘greater good’”.

A challenge indeed!

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