Technology Education and Industry Links - Bright Future or Repackaged Past?

Gary O'Sullivan
Massey University College of Education,
Department of Technology, Maths and Science education,
Palmerston North,
New Zealand.
e-mail:g.c.osullivan@massey.ac.nz

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Introduction

Late in 1999 the New Zealand Government published a booklet entitled *"Bright Future, 5 steps ahead, Making ideas work for New Zealand."* (New Zealand Ministry of Commerce, 1999). Max Bradford led the team that produced the booklet, the then Minister for Enterprise and Commerce and Minister for Tertiary Education. The purpose of the booklet was to highlight how the government planned to transform New Zealand in to a knowledge based economy. The challenge was how to reverse the trend which had seen New Zealand slip from being a country with one of the highest standards of living in the developed world thirty years ago to one of a much lower standing currently.

> *"New Zealand stands at a crossroads. Knowledge will be one of the essential drivers of the New Zealand economy. We are part of a global marketplace. We must create value from ideas. The five steps hold the key to a brighter future."*
> (Bradford, 1999,p.6)

The purpose of this paper is to highlight the current push in New Zealand for school industry links particularly in the area of technology education. Connections are made between government policy and the role of technology education. The paper includes observations of current practice and suggests some possible advantages of school industry links.

Bright future package and technology education: The connection.

Great rhetoric as one might expect from an experienced politician, but how are they going halt this slide? The five key steps of the Bright Future package were announced in February 1999. These are:

- lifting our skills and our intellectual knowledge base;
- better focusing the Government's efforts in research and development;
- improving access to capital;
- getting rid of the red tape stifling innovation; and
- promoting success, and supporting creative and innovative New Zealanders.

(NZ Ministry of Commerce, 1999)

The first of the five steps is focussed on education. The responses to this "step" include the introduction of scholarships for the brightest and best. These scholarships are designed to encourage able students to keep learning, particularly in the areas of science and technology.

The important elements of this scholarship are:

- 500 enterprise scholarships jointly funded with industry for the 2000 academic year, rising to 1500 by 2002. When fully implemented, these scholarships will be worth more than $30 million a year.
- Up to 80 doctoral scholarships worth around $40,000 each a year.
- Increased bursary awards for top maths, science and technology secondary school students, worth $1 million a year.
- $10.2 million over three years for teacher study awards and fellowships in maths, science technology and enterprise.
- Taskforce to ensure enterprise education meets the needs of business.
- $1 million over three years to foster enterprise education in schools.

(NZ Ministry of Commerce, 1999)

This link between the knowledge and wealth of a country is a viewpoint not only held by the New Zealand Government but others share it also:

> *Knowledge has become perhaps the most important factor determining the standard of living-today's most technologically advanced economies are truly knowledge based.* (World Bank cited in Bright Future, 1999, p. 12)

The link shared between wealth generation and technology education has also been raised by many when introducing technology in to the nation's curricula (Banks, 1994). It is of significance that around the same time as the publication of the five steps came the compulsory introduction of technology education in to the national curriculum of New Zealand. This new addition to the New Zealand education framework includes statements to support the links between schools and industry.

> *The link between schools and the community, including business and industry, tertiary institutions, and local authorities, is important to a well-developed, inclusive technology curriculum.* (Technology in the New Zealand Curriculum, New Zealand Ministry of Education, 1995)

In their recent publication 'Working Together Building Partnerships Between Schools and Enterprises' (1999) the New Zealand Ministry of Education outlines why these 'links' are required. The workplace of the future will be significantly different from what we know today and constantly changing in response to new technologies and changes in the economy. Schools will have to change to enable students to be successful participants in this new environment. One of the ways the New Zealand Government plans to improve education responsiveness to this issue is by incorporating into the curriculum framework the essential learning area of technology which encourages links with enterprise and industry.

Technology education and the wealth of a nation is not a new concept; it is a well-trodden path. The reason that school industry links are a topical issue seems to relate directly to the economic woes of the country. When a country is doing well school industry links are not top of the agenda (Molnar, 1996) However, if there is a economic downturn, it seems that the state education system comes under much closer scrutiny and criticism for not delivering the 'skilled' workforce required. This is a view supported by Price (1991) who claims that schools in general are allowed to concentrate on the needs of the individual rather than the economy when it is booming. However, in times of depression, schools must conform to the needs of society.

Bright future or repackaged past?

There has been little research done in New Zealand however in 1997, Kay Hawk published a final report on the technology development schools which were established by the New Zealand Ministry of Education in 1993. In the report, the author notes that there might be a mismatch between political ideology and actuality in schools. All four schools in the scheme endeavoured to forge links with industry and they were successful in the areas of job shadowing and work experience. However, the time and effort involved did not bring great rewards in other areas for example the learning outcomes of the pupils. Obviously this report involves only a small sample but it was in direct response to the government offering $400,000 in the Education Gazette for schools to become a 'technology development school'. There was a great emphasis on technology programs in all four schools, none of the schools particularly promoted careers in technology but there were early indications that the studies were broadening the students options and making them more attractive to employers. A similar scheme on a much larger scale was operated in the U.K. via the Technology College Trust.

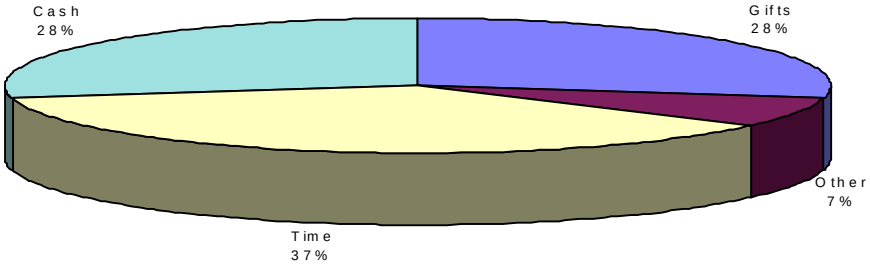
In the United States, one of the driving forces over the last couple of decades has been the publication of a report called 'A Nation at Risk'. According to Molnar, (1996) who has condemned the involvement of industries in schools, there were reports of outrage in boardrooms across America with the debased and trivial school curriculum, which was failing their children. This sounds all too familiar! 'Tomorrow's Schools', in New Zealand offered much the same rationale for educational reform.

It is suggested that some New Zealand schools have used their STAR (Secondary Tertiary Alignment Resource) funding for the promotion of school industry links. Molnar argues that, if the education system were to provide more highly skilled workers all that would happen would be that the level of discourse at the unemployment offices would be raised. Price noted that any improvement in the education sector which leads to further education for a higher number of students may, in fact, create a shortage of those ready to go in to the manufacturing industries. Additional questions about social justice and values and ethics might lead us to the conclusion that these links or partnerships are politically too hot to handle. Yet there are a significant number of schools both here and overseas who partake in some kind of link.

A recent addition to the Times Educational Supplement (TES) (1999) in the UK entitled "Business Links" included an article by Stephen Hoare, who describes how initial interactions with companies were based around donated information posters. There was a much greater involvement when, in the early eighties. The T.V.E.I. (Technical and Vocational Education Initiative) was introduced. This greater involvement continued with local management of schools and the technology college movement where schools were actively encouraged to seek industrial sponsorship.

The following pie chart was included in the TES article to show how business is investing in education. The chart highlights the involvement of the top 100 companies in the UK. The Education and Business Partnership (EBP) carried out the survey in 1998.

Figure One: Percentage breakdown of company involvement with schools.



Source: Times Educational Supplement (1999)

The author also notes that cash donations have been in decline, as businesses prefer to offer help in kind. The rationale for any support is made later in the article when the author states:

> *The reason why education comes top of the business agenda is not hard to guess. Skills shortages are biting across the board and young people's lack of basic skills makes them unemployable in a modern world. Under-performing schools eventually equals under-performing companies. It is not a case of philanthropy it is more a case of self interest.* (Hoare, 1999 TES)

A more worrying concern is the final reason offered in the article for the business involvement in schools. This is where selling and marketing to schools directly is seen as a future growth area. Perhaps we will see pupils as a potential cash crop or, at the very least, a "pester" power to force parents in to buying. This is a viewpoint shared by Molnar and this move seems to be an every increasing reality in the USA. Perhaps the bright future that the government is talking about is a bright future for companies able to sell direct to a brand new untapped marketplace: the school. This may sound abhorrent and not something that could ever happen in New Zealand. According to Molnar, it has been rife and increasing in America for years. The United Kingdom in reaction to growth has put in place voluntary guidelines to try to prevent it taking hold but the marketing people already have a name for it "cause related marketing". The trend is beginning in New Zealand there are a number of such schemes in operation in schools today such as "book it" pizza, "apple stickers" for sports equipment, "bread tags" for computers. Is it a bright future or just a repackaged past?

Specific links between technology education and industry.

In the press release for the bright future brochure the then Minister of Education (Dr. Nick Smith) said:

> *Many students study science, maths and technology subjects in the secondary school. These subjects make up the foundation of a knowledge economy.*
> (NZ Government press release, Bright Future package 1999)

This statement again places a onus on curriculum areas such as technology to produce students who will drive New Zealand's economy and reverse the trend from it's current low standard of living.

This paper has looked at possible causation for the bright future package links to education. The intention was not to dismiss the idea of school-industry partnerships but to make sure that teachers, particularly technology teachers who are at the forefront of this movement, consider such arrangements from an informed position. Obviously trying to enhance the teaching and learning for pupils in their charge should be their reason for taking part. Technology educators are particularly encouraged to engage in these links as stated in Technology in the New Zealand Curriculum (TINZ95). The curriculum cites business and

industry as legitimate contexts for technology education. There are also a number of organisations and initiatives that promote technology education links.

For example the Royal Society of New Zealand web site identifies it's main role as:

> *the promotion and support of science and technology education and to the improvement of the links between the science and technology community and the education sector from pre-school to tertiary.*
>
> (http://www.rsnz.govt.nz/education/index.php 4/5/99)

The Royal Society implements this policy by being involved in a number of initiatives these include:

- Technology Challenges: these are very successful. In 1996, 135,000 students took part in the school and regional Challenge events, in addition to many more enjoying them as part of classroom programmes. They generate a very high level of enthusiasm, enjoyment and satisfaction, in addition to developing skills and knowledge;

- Through its publishing unit SIR Publishing, The Royal Society of New Zealand produces a range of educational resources. These include the (DELTA) series. These publications are case studies highlighting existing practices looking specifically at the links between schools, technology education and local industries;

- Co-operation between the Royal Society and the Building Research Association of New Zealand (BRANZ) led to the development of the BRANZ ALPHA award. This consists of a $2 000 award at three levels. New Entrants - Standard 4, Form 1 - 2, and secondary. One award will be made to a school at each of these levels. The award is to be used by the school to further their work in technology and science;

- Science and Technology Fair projects can be big or small in scope. Any area of science can be covered, with projects in applied science and technology having become increasingly popular. An range of topics are explored in over 50,000 projects nation-wide - all involve investigation, challenge and imagination;

- The Royal Society of New Zealand supports the Technology Education New Zealand (TENZ) professional teachers association and its work in promoting technology education in New Zealand;

- The Young Investigators Programme is an initiative by the Royal Society to provide activities for Year 5 and 6 students, their parents and teachers. The programme also provides information on NZ science and technology and promotes science and technology career opportunities;

In 1994, the Institution of Professional Engineers of New Zealand (IPENZ) launched an initiative called the neighbourhood engineers scheme. This scheme has been described by TENZ as having the potential to provide schools with real assistance in the delivery of the technology curriculum. The concept was re-launched in 1998 with the intention of closely knitting local TENZ groups with IPENZ groups to ensure national coverage. CREST (CREativity in Science and Technology) schemes are also popular and they require students to work on projects with experts from outside of the school.

Potential benefits for students from participating in such initiatives include:

- Motivational aspects such as pupils working on real issues with real people outside of the school environment.

- Wider involvement with the community and increased understanding of the role of industry in the community.

- Improved careers advice.

- Accurate information available to pupils concerning specific enterprises or industries.

- Access to experts.

- Access to facilities beyond the scope of the school.

- Possibility of sponsorship, allowing extra funding to support the curriculum (see figure one)

- A greater understanding of the expectations of possible employers.

- Increased staff motivation through involvement in placements, etc.

Access to the latest technologies used outside of the school environment.

The different perspectives and underlying ignorance of what the each party, the school and the industry does often inhibits links from ever being started. However, according to some in New Zealand it is vital that we bridge this gap if our children are to receive the best education. (Br. Pat Lynch in New Zealand Ministry of Education, 1999). If the potential benefits mentioned above are indeed to be found in such a link which areas of the curriculum should lead the way?

The Bright Future booklet claims that technology education has an essential role to play. This is exemplified in the following statements:

Everyone will need to be literate and numerate and the so-called "soft" skills such as creativity, flexibility and teamwork will be more important than ever. So too will be problem solving and analytical skills and high levels of specialised knowledge, particularly in technology and science.

(NZ Ministry of Commerce, 1999 p. 17)

The "skills" mentioned above are all identified as essential skills in the New Zealand Curriculum Framework of which the technology curriculum is a part. For a business or outside organisation to be involved with technology education, there are also possible benefits. The following list is adapted from *Working Together Building Partnerships Between Schools and Enterprises.* Learning Media (1999)

They might include:

- Wider involvement with the community and a increased understanding of the role of education in the community;

- Opportunities for increased personnel training;

- Enhancement of public relations through community involvement;

- A greater appreciation of the attributes that technology education can offer;

- Improved employer/employee relationships through contact with children from their communities;

- Access to facilities for education and training of employees;

- Access to experts outside of their industry, e.g. language teachers who could be used to help with international trade i.e. translations;

- Increased staff motivation through involvement in school projects. Allowing employees to get involved in a community good i.e. education;

- Fulfilment of a altruistic desire to help improve the quality of teaching and learning;

Conclusion

Is there a bright future or repackaged past for young people in New Zealand? The early part of this paper focussed on why the recent push is included in government policy. Whether the rationale is a sound one is debatable. There have been some promising beginnings highlighted through resources like the Delta (1999) series of published case studies.

However, for some people, any involvement of industries in school is a concern. This may be due to a deep-seated mistrust or possibly a misunderstanding of what actually goes on. However, social justice is an important aspect of the education system. If we are to prevent children being seen as a "cash crop", we must ensure the quality and integrity of any link or partnership. Taking a "freebie" from an outside agency has to be considered carefully. We must believe that teachers are professional enough to critically evaluate materials prior to implementation and offer a balanced curriculum which considers the views of all interested partners, not just one.

Obviously, industry partners will keep their core business whatever, that might be, as paramount in any link and that is quite understandable. So too must the school, education of pupils is the core function of the school and any link must enhance that role. The technology curriculum will be under scrutiny from its implementation in 1999. However, to be the flag bearer for these partnerships or links is an additional burden it could do without. Implementation of a brand new curriculum area is going to be difficult enough without carrying the additional mantle of responsibility for school industry links. It is obvious that a number of parties have already made that association and many links are likely to be formed in the future. Their success or failure, I suspect will be determined more by the individuals involved in the links than the political push of the government.

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