Technology education in your school

Is your school providing the best opportunities in Technology education for your students? Are your students being equipped with skills and knowledge they need to participate in a technologically changing society?

WHY IS TECHNOLOGY IMPORTANT?

Technology is one of the essential learning areas in *The New Zealand Curriculum (2007)* and is compulsory for all students in New Zealand schools up to Year 10. As such, Technology provides exciting opportunities for all students to develop and extend their ideas and to explore creative solutions to practical problems.

Technology is becoming increasingly important in preparing students for tertiary education and technology-related careers. Students work creatively and analytically to identify, trial and evaluate potential solutions, and put their ideas into practice. Throughout the country innovative schools are enjoying their students' success.

As an approved subject for university entrance, Technology teaches a broad technological literacy which equips students with skills and knowledge essential to all kinds of work and university study, and most importantly it enables students to participate confidently as informed members of society.

Technology education motivates students to participate in purposeful activities, enabling them to integrate their knowledge and skills from many learning areas in real and practical ways. They learn to be creative and innovative in generating ideas, and to translate their ideas into action that most often results in technological products.

Technology also gives students opportunity for interaction with business and industry that provides them with professional and practical experience.

If your students are receiving the best opportunities in Technology then they will develop skills and knowledge to be confident in using a variety of means to address needs and opportunities to solve practical problems. They develop lateral and divergent thinking, and learn to explore choices and the factors that influence choice, such as culture and society, costs and benefits, aesthetics and fitness for purpose.

A well-delivered Technology curriculum presents students with new and exciting opportunities and challenges them in a way unlike any other subject.

WHAT'S HAPPENING IN NEW ZEALAND SCHOOLS?

Here are just a few examples which highlight some of the excellent technological outcomes being achieved by students around New Zealand:

Remote Stoat Trap Monitor

Westburn School Year 8 student Logan Glasson worked closely with the Department of Conservation to design a stoat trap monitor which monitors the status of traps in remote locations. He identified a need for this after helping his uncle clear stoat traps on the Moonlight Track in Paparoa Range and finding no

What educators are saying...

PROFESSOR JANIS SWAN
Associate Dean of Engineering, University of Waikato

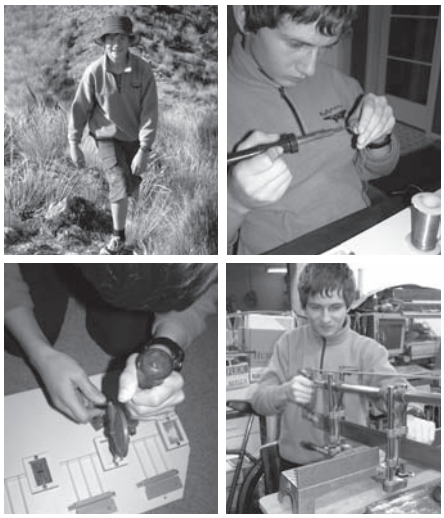
"Technology helps us transform ideas into reality, turn discoveries in the lab into full-scale production, develop new things and services, and to find new ways of doing things. Technology offers innovative ways of solving many of the challenges and problems we face today.

"We urgently need people with the skills to look at a situation in an innovative way, who can develop a new material, a new process, a new device, or a better way of doing what we are currently doing."

PROFESSOR BOB HODGSON
Director, School of Engineering, Massey University

"Globalisation and technological change are two key features that are changing and shaping our lives.

"The Technology curriculum has now developed to a level that I strongly recommend it as a subject, both to students who have an interest in making a career in engineering, technology or science, and generally as a means of better understanding the modern world."



stoats had been caught at the top of the 9km line.

Logan designed a radio transmitter to signal to a base unit when stoat traps are tripped. Logan investigated the radio signals required for his design, explored various timing systems to turn the transmitters on and off and created a prototype operating program for his monitor.

"I have enjoyed making my pest trap monitors, and I think it is great that by using my enjoyment of computer programming and electronics I could help New Zealand's native wildlife," he says.

Logan won the 'Best in Fair' prize at the 2008 Canterbury Westland Regional Science Fair and gained second place in the 2008 Bright Sparks Competition for the 12 years and under category.

Strip-built Racing Kayak

Wellington College Year 13 student Sam Notman decided to build a one-person flat water racing kayak for his client who is a multi-sport competitor. This was in response to a problem his client had with his current kayak which was too small for him and sat too low in the water.

Sam researched the problem and decided that a new kayak would be the best solution. Additional research on technical requirements and costs showed Sam that it was possible to build a kayak, strip-built from wood, within a budget of $500.

"The client wanted a really light boat that he could carry and put on his car" says Sam. The client also wanted the kayak to be strong and built for speed, which meant it had to sit high in the water with minimal drag. For advice on the correct woods to use, Sam consulted with Wellington Timber Specialists.

Sam spent many hours testing his design through mock-ups that explored shape and form, and balance and finish. When problems arose Sam modelled solutions and discussed alternative approaches with experts he had contacted and befriended. Once the kayak framework was complete, Sam covered it temporarily with a heavy plastic skin and heat shrink-wrapped it for full sea trials, and then finished it with epoxy-resin coated nylon.

The kayak passed with flying colours and the client was so happy with the results that, although he originally intended it for training, he now wants to race with it.

Finger Food for 300

Northland's new regional TV station Channel North launched its Pukeko Echo Television (PET) project at Manaia View School in August 2008.

HOD Technology Heather Whaikawa offered the task of catering for the function to a small team of Year 7 and 8 Technology students.

Their aim was to successfully plan, cook, present and serve a fantastic array of nibbles to 300 guests at the black-tie launch which included a Member of Parliament and many local dignitaries.

The students researched the brief and obtained professional advice on menus, servings, presentation and purchasing.

Technology projects provide great opportunities for media coverage to increase the profile of your school within the community

Sandwiches whets designers' appetites

SOPHIE NEVILLE

A LOCAL bar has been lit up by a team of Wellington High School students who have spent the year designing innovative lighting.

The students — Ruth Keiry, Shaun Graham, Sarah Jordan, Lance Corlett, Amy Richards, Ann Hibbard and Lauren McManamon — unveiled their works at inner-city bar Sandwiches last month.

The seven year 12 students have spent the entire year working on the technology project that saw them involved in the planning, design and making of the lights.

From table lights to metre-high works of art, the lights were designed especially for Sandwiches. Students spent time at the bar working out the space and deciding on a concept for their designs. The brief was to create something with a 1960s Kiwiana feel.

Ruth said her light "took over my life". She spent hundreds of hours on her project — a wooden side table lit from the inside and lined with old 60s-era curtain material.

"It got to the point where we were missing other classes to work on our lights. It was just manic."

She was very pleased with the result and said designing something for a bar had been exciting. "It makes you feel appreciated. It's cool because throughout the whole thing, we've talked to the managers and kept them updated."

Classmate Shaun was told by numerous people his spiralling concrete design was impossible. A huge amount of work later, the 17-year-old proved doubters wrong and created a metre-high bar table, lit with red lights coiled through the concrete cylinder.

"It's a miracle it worked, really — 90 per cent of people told me it would fail."

Sandwiches co-owner Bryce Mason said he was blown away by the standard of the designs. "They are absolutely incredible."

Illuminating: Ruth Keiry and Shaun Graham with the lights they made for Sandwiches bar. "Ninety per cent of people told me it would fail," said Shaun of his spiralling concrete creation. Picture: ROSS GIBLIN

Schools reap Joseph's designs

JOSEPH FOLOIE, a Wellington College year 13 student in 2006, has designed and built a school seat he says is more hard wearing, less expensive and more comfortable than most outdoor seats used in schools.

His work has been recognised by Techlink, a joint venture of the Education Ministry and Engineers New Zealand, which provides advice on technology education to schools.

Joseph said he had always been interested in design. He started work on the school seat at the suggestion of Wellington College deputy principal Dave Ashby, who was upset at the state of the school's seating.

Joseph said many of the school's seats were in poor condition, unable to cope with the ravages of weather. Many were too low and uncomfortable, providing no back support. Some were potentially unsafe.

He designed a seat with a steel frame and made of decker wood. "I chose it because it's easily maintained and inexpensive."

Joseph also designed special acrylic sheets inserted between the seat panels, to prevent rubbish being put in the gaps. He also designed a backrest at an angle of 81 degrees for maximum user comfort.

After three months' work his creation was assembled and ready for the big test.

"I got 10 boys to jump on it. They didn't break the frame."

Joseph believes his seat cost between $400 and $500 to make. Similar-sized seats cost about $1000.

However, it remains a prototype.

Last year Joseph received scholarships in design and technology.

This year he is a student at Nayrdi design technology, a national private education provider.

Another successful job last year was designing a set of cricket wickets for nearby St Mark's School.

Joseph's wickets automatically return to shape after the stumps have been removed, saving the time normally spent reassembling the stumps after a batsman is bowled or run out.

He used a system of springs and sprockets, and he made a base for the stumps that included the St Mark's logo.

Joseph Foloie with his school seat.

Student praised for paua project

Stakeholders were identified and consulted with and an action plan was developed.

"We wanted the food to look classy and be tasty, but as a 'Gold Heart Beat Award' school we also wanted to be careful to make sure that it would meet the requirements of a health promoting school," said Heather.

A week before the launch, the group held a trial run. All food was prepared and the stakeholders invited into the school to sample the food and suggest improvements where necessary.

On the day, the students did a fantastic job of presenting the food and making sure everything was cleaned up afterwards.

Principal Leanne Otene received a huge number of positive comments from the guests.

"When I told them that it started as a Technology brief and that everything had been done by the students themselves with very limited adult support, they were even more impressed," she said.

"Heather and the group catered for a black tie event with the skills of a professional catering company. I have never been so proud."

In this project, which won the $2,000 first prize in the 2006 Transpower Neighbourhood Engineers Awards, ten Year 5 and 6 children from Elm Park Primary School worked with Beca chemical engineer Eleanor Marks to design and create a fountain to brighten up the entrance to their school's international office.

"The children constantly impressed me with their creativity," she said. "They don't need to be told to think outside the square, they seem to just think that way."

What industry leaders are saying...

DR ANDREW CLELAND
Chief Executive of the Institution of Professional Engineers New Zealand

"As New Zealanders we pride ourselves on being self-reliant and on our ability to be innovative. To be competitive requires a high level of technological knowledge and expertise.

"IPENZ considers that the current Technology curriculum can provide the foundation to develop the technology graduates vital to our future, and to ensure that every New Zealander can thrive in an increasingly technologically engaged society. It is vital that all our citizens – from young children to the elderly – have a level of technological literacy that means they have the knowledge and confidence to choose and use the best technologies. And not just in a consumer sense – throughout our whole society there needs to be a deep understanding and valuing of the way technologies empower us.

"With such a base our innovative thinkers can then be world-leaders in the way we use technology."

DR SALLY HASELL
Former President NZ Institute of Food Science and Technology

"The food industry in New Zealand is a major generator of wealth, both in terms of income and employment opportunities. A large proportion of the people working in it and in its supporting industries are technologists.

"Specialist food technologists and biotechnologists work to develop new crops, foods, and processes that increase the diversity, convenience and desirability of the foods New Zealanders purchase and export. In addition, producing, transporting, storing, selling, packaging, and all the other aspects of managing food production from the farm to the table, require input from a diverse range of technologists in areas such as IT.

"Technology is the life blood of the food industry and therefore of New Zealand's prosperity and well-being. NZIFST encourage and support young people to see technology as a great future."

WHAT STUDENTS ARE SAYING ABOUT TECHNOLOGY

Josh Fransen, contract supervisor for Brian Perry Civil:

"Working in the civil construction field, my job requires a lot of the skills learnt in Technology, in particular, planning, problem solving, client emphasis, initiative, working in a team, multi-tasking, and self management.

"What I liked most in Technology classes was the mix between work in the workshop and the paperwork, and seeing the results of what I had completed; watching it evolve from paper to a finished product."

Alice Irving, studying for a conjoint degree in Law and Arts at Otago University:

"The skills I learnt in Technology Education have been invaluable at university. Technology was my first real chance to tackle large projects which required considerable time management and self-discipline to complete. This has equipped me for the university environment.

"Technology encouraged me to self-evaluate, to respond constructively to input from others, to problem solve and to think laterally. These are all skills which are highly transferable to university study, regardless of the particular field you choose to pursue".

How can Techlink help...

The Techlink site – **www.techlink.org.nz** – reflects a significant and growing body of research and classroom practice. It provides resources to support schools and teachers to help in the implementation of the Technology curriculum. At Techlink you will find examples of contemporary teaching and learning in Technology, curriculum support, and encouragement for teachers in their ongoing planning and implementation of classroom programmes.

CURRICULUM SUPPORT

Techlink's curriculum support package includes: Ministry of Education guidance and overview; explanatory papers of each of the achievement objectives, indicators of progression, unit planning papers on technological literacy, programme design, values, and key competencies.

The full curriculum support package can be viewed online and downloaded as PDFs, at **www.techlink.org.nz**.

The Ministry of Education also welcomes ongoing feedback on the usefulness of this package, and guidance from principals and curriculum leaders as to any additional material schools and teachers would find useful.

INFORMATION FOR PARENTS

Techlink can assist with providing parents with information about Technology.

The Techlink Information for Parents section outlines what Technology is, emphasises its importance and the skills and benefits gained from Technology, explains the three learning strands and Technology levels, and includes various testimonies from students, parents and experts.

This site also has printable resources that can be handed out for parents to take home.

For more information visit: **www.techlink.org.nz**

TECHLINK MEDIA KIT

Techlink also provides support and assistance in dealing with the media and writing media releases.

Getting media coverage of your school's Technology projects can be a great way to raise your school's profile and celebrate the achievements of your students.

The Techlink Media Kit takes you through a step-by-step process from identifying a potential news story to contacting and dealing with journalists.

A detailed media kit and the full curriculum support package can be downloaded from the site.

For further assistance, please contact: **comms@techlink.org.nz**

TECHLINK IS A PARTNERSHIP BETWEEN THE INSTITUTION OF PROFESSIONAL ENGINEERS (IPENZ) AND THE MINISTRY OF EDUCATION

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