Technology is really a way of Thinking

AUSTRALIAN ACADEMY OF TECHNOLOGICAL SCIENCES AND ENGINEERING (ATSE)

Leighton Holdings Limited

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Why produce this brochure?

The Australian Academy of Technological Sciences and Engineering has been working for a number of years with those concerned with the introduction of Technology Education into schools. It is clear that progress in this area of education is inhibited by a low understanding of the meaning of technology and of the objectives of technology education.

The Academy has produced this brochure to help the community understand the purposes of technology education in schools.

Technology is not new

Technology has been changing the way people live since humankind began to differentiate themselves from other animals.

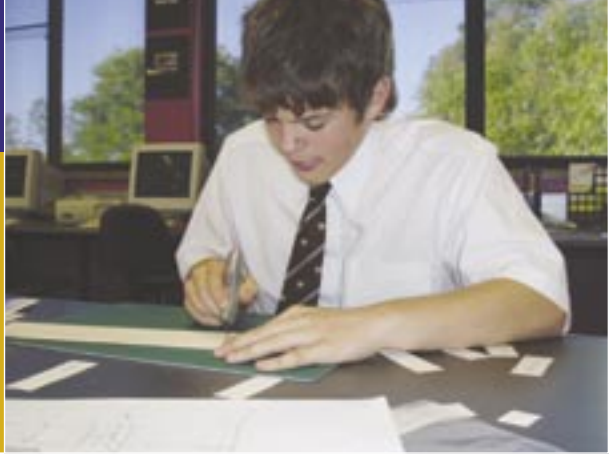
Technology is the outcome of creative thinking. It is about applying knowledge to solve everyday problems and to make the most of opportunities as they arise. It is about designing systems and machines to improve our lives and to make living easier.

In early times we made levers to help lift heavy stones, and then wheels to help men and women move heavy objects. The wheel became the basis for a vast transportation system. Then we developed beyond the limitations of the wheel with hovercrafts and magnetic levitation vehicles. Our capability to invent new and better technologies seems to be without limits.

Technology is really a way of thinking

Technology is a way of thinking. It is all about using what is known to solve problems and make life easier and more exciting. Many technological solutions are called inventions.

Technology is the process of designing and then making what has been designed. Knowledge and ideas are tested in practical ways, and then improved upon until the best solution is developed. Designing in technology has to be enterprising, and people must be able to think laterally and creatively. The products of technological thought underpin wealth creation and employment generation.



Technology education

Technology education involves a combination of intellectual and practical activities encompassing planning, researching and coming up with ideas, then testing those ideas in reality, that is, in designing and making. These activities promote initiative, organization, confidence, team building, responsibility and adaptability. These enterprising behaviours help students cope with their future roles in a complex technological world. The skills they develop are transferable across the curriculum and beyond school into the home and industry, commerce and business, and will ultimately contribute to an 'enterprise culture' of innovative and globally competitive technologies.

In technology education students identify and research opportunities, then act on them as individuals or in groups, and so experience the complex processes of bringing an idea from conception to fruition. They learn to work with others in teams, to listen to the ideas of others and to respect and evaluate them.

Many wrongly see science as the knowledge base of all technological thought. In fact, technological knowledge comes from many areas of learning – science and mathematics, the arts and social studies and complements and supports advances in engineering. This knowledge is applied in new ways in areas such as transportation, communication and information technology, new energy sources and biotechnology. Without technological understanding the processes of invention and of creating new products and services in these areas are likely to be beyond the reach of many.

Technology education is about the synthesis of knowledge, ideas and skills and the development of innovative capabilities. In its focus on synthesis, design and invention it embraces creativity across the full spectrum of a student's learning. In a real sense, this synthesis places technology education as a significant integrating force within schooling. It is learning through practice.

Technology education is an essential part of schooling because it is the place in the school curriculum where students get the opportunity to concentrate on developing creative and innovative ideas and then on testing

these ideas in a practical context. It is not just about making things. It could be about designing the governance of Australia as a republic.

Science, on the other hand, places a strong emphasis on analysis. It breaks down complex observations and images. It seeks knowledge and understanding at the most fundamental level. Its approach to understanding is through observation, ordering, classifications, hypotheses, theories and, eventually, it is about natural laws. It is about thought and the assembling of ideas. Science asks - Why is it so? Technology, on the other hand asks – What is the solution?

Living in the 21st century

Living in the 21st century, particularly full participation in our complex democracies will demand knowledge of science and experience of technology, both the processes and the products. Increasingly citizens will be asked to make judgements on matters dependent on scientific and technological knowledge and intuition. These are important skills for all students, regardless of the vocational choices they make.

Those who do not gain this knowledge in schools will be without power in exercising their right to vote on many issues. They will be deceived and exploited by those who misuse our democratic processes through the peddling of misinformation and fear.

Some misconceptions about technology education

Many see technology education as simply learning to use computers. Computers are examples of technology; they are useful outputs from the processes of technological development. Students will find computers useful in their courses in technology, just as they do in all their subjects.

There are others who see technology education as the traditional technical courses in secondary schools such as metalwork, woodwork and home economics. The important design

and thinking skills that are fundamental to technology education have not necessarily been the foundation of these long-standing programs.

Many also see this curriculum area in schools as valid only for those who have difficulty in meeting the demands of the more academic subjects. If Australia is to become a more innovative and enterprising country, technology education in schools has a central place in the education of ALL students.

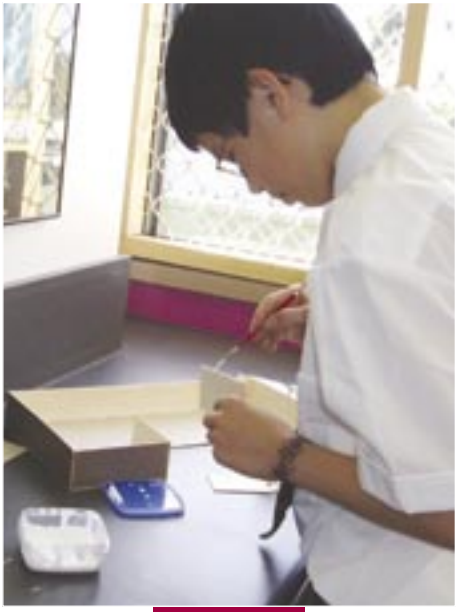
What will I be able to do if I study technology?

I can expect to gain experience and skills in investigating, designing, producing and evaluating. These outcomes will be acquired through practical experience in coming up with creative ideas and then producing products, systems or services as a result.

Since technology is the process of applying knowledge in a practical way, I will expand my knowledge through investigating materials, technologies and the environment in seeking to devise better and more appropriate solutions. I will learn to use a range of tools in producing these practical solutions.

I will learn to work with others in teams, to communicate ideas and to consider the impact of technologies on the lives of others and on the environment.

I can study technology from the beginning of school right through to Year 12. Many technology subjects in years 11 and 12 are useful for university entrance, and provide a good basis for further studies in areas such as engineering, applied sciences, industrial design and architecture.



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