Nature of Technology

CHARACTERISTICS OF TECHNOLOGY

- Technology is a purposeful intervention-by-design human activity that results in technological outcomes that impact in the world.
- Technology enhances the capability of humans to transform materials, energy and information.
- Technology uses and produces technological knowledge which is validated in the successful development of a technological outcome.
- Technology is historically positioned and inseparable from social and cultural influences and impacts.
- Contemporary Technological Practice is increasingly collaborative and inter-disciplinary

CHARACTERISTICS OF TECHNOLOGICAL OUTCOMES

- Technological outcomes are material products and systems developed for a specific function through Technological Practice.
- A technological outcome is evaluated in terms of its fitness for purpose.
- Technological outcomes can be described by their physical and functional properties.
- The terms 'Proper function', 'Alternative function' and 'Mal-function' can be related to technological outcomes.

THE TECHNOLOGY CURRICULUM STRANDS

Technological Knowledge

TECHNOLOGICAL MODELLING

- Technological modelling refers to modelling practices used within technological developments, and includes functional modelling and prototyping.
- Functional modelling allows for the ongoing evaluation of design concepts for yet-to-be-realised technological outcomes.
- Prototyping allows for the evaluation of the fitness for purpose of the technological outcome itself.
- Through technological modelling, evidence is gathered to justify decision making within technological practice.
- Modelling is crucial for the exploration of influences on the development, and for the informed prediction of the possible and probable consequences of the proposed outcome.
- Technological modelling is underpinned by functional and practical reasoning.
- Functional reasoning focuses on 'how to make it happen' and 'how it is happening'.
- Practical reasoning focuses on 'should we make it happen?' and 'should it be happening?'
- Decisions as a result of technological modelling may include the: termination of the development in the short or long term, continuation of the development as planned, or changing/refining the design concept and/or the nature of the technological outcome before proceeding.

TECHNOLOGICAL PRODUCTS

- Technological products are material in nature and exist in the world as a result of human design.
- Understanding the relationship between the properties of materials and their performance capability is essential for understanding and developing technological products.
- Technological knowledge within this component includes the means of evaluating materials to determine appropriate use to enhance the fitness for purpose of technological products.
- It includes understandings of new materials formulation and their potential impacts on future product function.
- The impact of material use and development on product life cycles/expectancy is also included with regards to understanding material sustainability in its broadest sense.

TECHNOLOGICAL SYSTEMS

- Technological systems are a set of interconnected parts (technological products and processes) that serve to transform, store, transport or control materials, energy and/or information.
- These systems exist in the world as the result of human design and function without further human design input.
- Understanding how these parts work together is as important as understanding the nature of the each individual part.
- Technological knowledge, within this component, will include an understanding of input, output, transformation processes, and control.
- Understanding the notion of the 'black box' is included in this component, in terms of understanding, and of developing, complex systems that involve integrated sub-systems.
- This component includes understandings of redundancy and reliability within system design and performance and therefore an increased understanding of the operating parameters of systems.
- Specialised languages provide important representation and communication tools. Understanding these specialised languages is important in system development, maintenance and troubleshooting

Technological Practice

BRIEF DEVELOPMENT

- Brief development is a dynamic process that reflects the complex interactions within ongoing Technological Practice.
- A brief is developed to clearly describe a desired outcome that would meet a need or realise an opportunity and takes into account the physical and social environment.
- It is comprised of a 'conceptual statement' that communicates what is to be done and why it should be done.
- It also includes specifications that define the requirements of a technological outcome in terms of its physical and functional nature.
- The specifications provide guidance for ongoing evaluation during the development of an outcome, as well as serving as an evaluative tool against which the final outcome can be justified as fit for purpose.

Brief Development can be thought of as the 'defining' practices of Technological Practice

PLANNING FOR PRACTICE

- Effective planning techniques are critical for informed and responsive Technological Practice.
- Planning tools must be fit for purpose if they are to ensure the successful development of outcomes.
- Planning allows understandings from past and current experiences, as well as those that may be reliably forecasted, to be taken into account in a systematic and managed way.
- Efficient resource management and accessing of stakeholder feedback relies on forward planning.
- Planning for practice incorporates ongoing critical evaluation and efficient and appropriate documentation.

Planning for Practice can be thought of as the 'organising' practices of Technological Practice.

OUTCOME DEVELOPMENT AND EVALUATION

- The development of a technological outcome (product or system), or any other outcome of technological practice (concepts, plans, models, etc.), involves the creative generation of design ideas and the refinement of potential outcomes.
- This is achieved through ongoing research, experimentation, analysis, testing, and evaluation against the specifications of the brief.
- Developments should be based on the evaluation of the functional modelling undertaken during practice, and prior to the realisation of the outcome.
- Refinement of a realised technological outcome should be informed by evaluations from prototype testing *in situ*, in order to optimize its fitness for purpose.

Outcome Development and Evaluation can be thought of as the 'trialing and production' practices of technological practice.