Review

Design & Technology – For The Next Generation

Title:	Design and Technology for the Next Generation
Editor:	David Barlex
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Overview

The book is a collection of essays by most of the leading contributors currently active in the development of Design & Technology. It is very broad ranging, covering almost every key issue within the subject and summarising the most important questions which need to be answered to assist the continuing evolution of our subject.

If you are an involved in research or policy formation in Design & Technology, then you must obtain a copy of this book. In effect, it sets the agenda for research in, and the development of, Design & Technology over the next decade.

If you are aspiring to a senior teaching position in the subject, either as a Director of Specialism, or a Head of Faculty or Department, then an awareness of, and an opinion about, the various topics covered in this book will be essential to answer interview questions about the development of the subject. If you are already in one of these positions, reading this book will clarify or modify your current opinions, improving your schools approach to how pupils learn in Design & Technology.

If you are a teacher of Design & Technology, this book will give you an indication of how things may change in our subject over the next few years. Within the articles, there are also many excellent ideas that will allow you to improve your teaching of the subject.

Background to the Review

The book is a collection of essays by most of the current key figures in the development of Design & Technology. Each essay covers just one or two aspects of the subject, identifying many of the key questions that need to be answered for the further development of our subject. The format of the essays is to highlight the key questions within that area, followed by a discussion or review of possible routes forward.

The authors of this review are two classroom practitioners, identified as part of the Audi Design Foundation New Talent Forum as two of the outstanding newcomers to teaching Design & Technology from the last five years. As relatively new practitioners compared to most of the contributors to the book, it was felt appropriate that we should carry out the review as it will be up to our generation of teachers to take responsibility for implementing many of the possible developments outlined.

This is not really the type of book that most readers will read from cover to cover, even though in the opinion of these reviewers it would be hugely advantageous for most people participating in, or influencing, the field of Design & Technology to do so. Most likely, the majority of readers will select specific topics within the book, to address their own interests. Therefore, rather than make a broad discussion of this exceptional work, we have decided to provide a brief taste of the contents of each essay, followed by giving our opinions about the overall collection.

The Individual Essays

David Barlex asks why we teach what we teach in the design and technology curriculum. He looks back at the birth of the subject before discussing in significant detail the issues surrounding the justification of the subject. He finishes with word of warning about the possibility of overload for the subject if too many unrealistic responsibilities are placed upon it. This chapter represents a thorough and thought provoking start to the collection of individual essays.

Marc de Vries reflects philosophically on how we think about technology. He discusses how our view of technology as either artefacts, knowledge, processes or as a property of humans affects our approaches to the subject.

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Stephen Petrina considers the politics of technology by giving a view of what technology could be like in 2020. He overviews some of the major current issues that will affect our future approaches to Design & Technology. This is an inspirational justification for extending our normal approaches to fully teaching the implications of technological developments.

Malcom Welch investigates the beliefs and philosophy of designers that underlie designing. He achieves this though short focussed pieces on a wide range of individual designers, ranging from Starck, Ive, Bruer, and Le Corbusier, to Kamen, Issisgonis and O'Kelly. In the classroom, the extracts on individual designers have already proved to be a very effective resource to get pupils thinking about the values underlying design.

Steve Keirl considers how political views, both as a profession and as individual teachers, may affect our vision for the curriculum in Design & Technology.

Margarita Pavlova and James Pitt investigate the increasingly important issue of sustainability and its place in the D&T curriculum. They show via graphical examples how the ecological footprint varies from region to region across the world, and use this to illustrate the point that the levels of consumption in the industrialised world are currently unsustainable. They discuss what is meant by sustainable development and the implications of education for sustainable development in the subject.

John Dakers asks if vocationalism is a friend or foe to design and technology education. He provides a relevant historical account of education which links to the current issues surrounding vocational education in the subject.

Nick Balwin and David Barlex explore how teachers can make a contribution to the Design & Technology curriculum. They state that this is focussed on newly qualified teachers (NQTs) and provide a concentrated overview of the factors that will support success in the classroom, not all of which will be within the authority of the NQT. This essay will be very useful to Heads of Technology Departments (HODs) who wish to see the teachers in their department and their subject develop successfully, as it clearly indicates the supporting structures that they and the school need to put in place for success. In the opinion of these reviewers, this should be compulsory reading for new HODs.

Malcolm Welch, in his second contribution, looks at the pupil as a designer. He begins by asking if teaching pupils to design is important and provides a clear rationale to support design education for all pupils. He dedicates the rest of the chapter to tasks that encourage learning to design and appropriate pedagogy to allow this to take place. One useful tool presented is the design pentagon, which provides a clear overview of the various interrelated design choices that can be made by pupils in the classroom.

Marion Rutland and David Spendlove encourage the reader to "think about their pupils' creativity" when addressing the issue of creativity in design and technology. They describe such strategies as four by four, morphology and SCAMPER when showing how creativity can be fostered in pupils. They conclude that the role of the teacher is pivotal in allowing pupils to be creative in the classroom.

Moshe Barak overviews the social context of problems, overviews problem solving methods (such as SCAMPER, TRIZ and Systematic Inventive Thinking) and discusses how focussed thinking about problems can be used to inspire creative solutions.

Gwyneth Owen-Jackson and Torben Steeg discuss the role of technical knowledge in design and technology. They usefully ask the reader to think about the technical knowledge that they might have needed in a past design and make project, and also use examples of pupil work to illustrate this point. They ask what knowledge pupils might need, as well as what defines technical knowledge. One interesting reference is made to systems thinking in electronics, which has allowed pupils to make real design choices without having to engage in particularly complex mathematical and scientific ideas.

Frank Banks and Gwyneth Owen-Jackson discuss an issue that has caused a great deal of recent debate, the role of making in the subject. The role of CAD/CAM as a making tool is examined and the reader is asked to think about how they would justify the teaching of this in schools. They conclude that making is an integral part of the learning process in D&T, whilst at the same time acknowledging that the opinions of the reader will largely shape their overall opinion of the place of D&T in the curriculum.

Stephanie Atkinson and Paul Black have provided an outstanding contribution on using assessment to improve pupils learning and attainment in Design and Technology. They provide clear guidance on the often misinterpreted subject of what Assessment for Learning is and what the implications of applying formative assessment are. They show, supported by clear examples, how formative assessment can be applied through questioning, written feedback and self- and peer- assessment.

REVIEWS

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Dov Kipperman and Mark Sanders demonstrate the clear justification for the use of true interdisciplinary learning across Science, Technology, Engineering and Maths (STEM). Examples are given of the misunderstandings and subject tokenism which is sometimes referred to in practice as an interdisciplinary teach. They identify a number of different approaches by which actual interdisciplinary learning can be achieved in the STEM curriculum.

Patricia Murphy addresses gender and pedagogy. An excellent example of two separate classroom discussions demonstrates how teachers can approach boys and girls very differently, based on pre-existing perceptions of their roles in society.

Wendy Dow explains how our implicit theories or innate assumptions can affect a teacher's activities in the classroom. She also includes the difference between performance goals and learning goals. This will be a very useful essay for classroom practitioners who wish to further integrate new approaches into their teaching style.

Peter Toft, in the final essay, provides an astute summary of the contributions of the different authors and draws out many key questions, showing how these fit in with the current context both at a subject level and in schools.

Overview of the Collection

The collection of essays, and in particular Peter Tofts' summary, infer an excellent snapshot of where the subject is now. The book succeeds in identifying many of the questions that need to be answered for the further development of the subject area. As such, it potentially sets the agenda for research in many areas of our subject. What is slightly unclear is how answering all of the different questions raised might mesh together to form the 'bigger picture' of how Design & Technology will develop over the next decade. However, it could be argued that this would either need an assumption as to how the multiple strands of questions may be resolved or that attempting to provide such a vision would have proved perhaps too challenging for any individual or group to write without setting out their own opinion as a manifesto.

Within individual topics, the authors generally avoid giving recommended approaches, although they often provide several examples or suggestions. This is both the strength and weakness of the book. The readers understanding of the underlying broader issues and principles in key areas of the subject will almost certainly improve as a result of reading this book. Further, the reader will be able to modify or form their own opinions about these topics without

having to follow a context-ignorant prescription. This improved understanding and consideration of possible options will almost certainly lead to an improvement in how we support our pupils learning in Design and technology. With so many ideas and inferences in this book, it could take many years for individual teachers or departments to effectively implement even just those that are directly to their local context, giving the scope for continuing incremental improvements throughout this time.

If your perspective is that, as a group, Design & Technology teachers are good at communicating and adopting best practices, then the potential for local evaluations of a diverse range of new approaches could move the subject forward significantly. If your perspective is that we as a profession need to improve how well we communicate and embrace alternative approaches, there is a risk that this may lead to increased diversification or even fragmentation of the subject at a national level unless a co-ordinated approach is adopted. That said, if the ideas in these essays were adopted effectively it is clear that that either way they will improve that which is most important – the learning of our pupils in this subject.