Design and Technology Education: An International Journal

22.3

Contemporary Research in Technology Education

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This is an excellent book that has been published to encourage and engage teachers in research informed practice. There are eleven international research projects that focus on a range of design and technology issues

Chapter 1, Introduction written by the editors breaks the book down into four clear sections: Broad Approaches to Engaging Pupils with Designerly Thinking which draws together three pieces of international research which focus on applying this methodology in different settings. The second section: Focused Teaching and Learning in Technology Education addresses the complexity of teaching a wide range of challenging topics within technology education and the benefits of addressing real rather than abstract problems. The third section: Classroom Talk reviews the importance of communication across phases providing an overview of pupil experience and background and the final section: Communities of Practice focuses on three different communities that come together to support each other in different contexts. This introductory chapter clearly sets the scene for some interesting and relevant research that can impact upon our practice.

Chapter 2, Ideas About Design: Towards Appropriate Pedagogy for Teaching Design at the School Level written by Farhat Ara (India).

This paper explores pupils understanding of design, it highlights pupils' initial ideas of design being simply a decorative outcome. The author explores the depth and breadth of knowledge required to teach and learn effectively. Farhat presents a number of solutions to encourage this practise and to solve a wide range of problems using different frameworks and principles.

Chapter 3, Fostering Deep Learning and Critical Thinking Amongst Net Generation Learners written by Matthew Watkins (England)

An interesting application of audio-visual resources designed to engage the Net Generation and to develop their critical thinking skills within HE. Opportunities for applying this to secondary education and the opportunity for delivery by non-specialists were highlighted as possible developments.

Chapter 4, A Case Study on Problem-Solving Based on a Design Process in a Middle School Invention Class written by Jae-Young Yu (South Korea)

An interesting paper that reviews how pupils adapt a design process to solve a problem within a team. Brainstorming was engaged throughout the process and the evidence presented shows that the cycle was far from sequential.

Chapter 5, CAD and Creativity at Key Stage 3 written by Deborah Winn (England)

A timely chapter given the range of resources available for teachers and students which in itself creates problems in terms of experience in using and teaching CAD. The action research study took place with four different groups of students each of which made suggestions as to how the learning could be improved to increase engagement and understanding. A simple resource was developed to support pupils as they progressed through the 3D CAD software and this was implemented within the research to support pupil pairings.

Chapter 6, Mixed Media Modelling of Technological Concepts in Electricity written by Sarah Pule (Malta)

This chapter examines how learning can take place within engineering and technology, specifically the field of electricity. Learning resources focus on visual and kinaesthetic learning and relate closely to the familiar standard electrical symbols. Further developments highlight the idea of embodied cognition and how this should encourage teachers to make concepts visible and tangible to students.

Chapter 7, Difficulties in Teaching and Learning Sectional Drawing in a University Based in the Eastern Cape, South Africa written by Samuel Khoza (South Africa)

A qualitative and quantitative study that focuses on HE students studying Engineering Graphics and Design. Issues surrounding how sectional drawing is taught and learnt are discussed which includes a lack of experience prior to entering HE. A number of recommendations are made including a focus on line work and drawing models to develop visualisation skills.

Chapter 8, Let's Get Kids Talking in Technology: Implications for Teachers written by Wendy Fox-Turnbull (New Zealand)

How can talk play a role in learning technology? A very interesting piece of work set in the primary classroom. Participants were given cameras to take photographs to discuss later – 'autophotography'. The use of disposable cameras also prevented students from deleting pictures. The paper identifies three strategies that teachers can use to improve teaching and learning by using their initial knowledge, their cultural knowledge and to encourage intercognitive conversations amongst their students.

Chapter 9, Teaching Bioethics: The Intersection of Values and the Applications that Advances in Technology Make Possible written by Deborah Stevens (New Zealand)

A challenging and thought-provoking chapter that questions the developments in science and technology that pupils will encounter when they have to make choices. How do we ensure they are ethically prepared citizens? Stevens' research identifies a wide range of contexts and strategies that support effective teaching of Bioethics.

Chapter 10, Exploring the Role of Professional Learning Communities in Supporting the Identity Transition of Beginning Design and Technology Teachers written by Denise MacGregor (Australia)

The first year of a teacher is one of the most important and how this is managed will affect the progress of that individual. The author draws upon evidence from five case studies and highlights two major mentoring roles that have a significant impact upon progress. There is also a need to evaluate good practice of current mentoring programmes and to identify aspects that can be shared through professional learning communities.

Chapter 11, Technology Education Teachers' Professional Development Through Action Research written by Tomé Awshar Mapotse (South Africa)

This chapter highlights the challenges that developing countries face with Technology Education and the need to further develop unqualified and underqualified teachers through action research. It is clear from the research that the starting point for experience was very low. The author identified a number of areas that teachers could access to help improve their knowledge and skills including identifying a local university. Finally, he identified a six-week programme to empower teachers through action research.

Chapter 12, Technology Education: Education for Enterprise (E4E) in New Zealand (A Connected Curriculum) written by Gary O'Sullivan (New Zealand)

This chapter focuses on the development of technology and enterprise education as equal partners but as a creative connected curriculum. Education for enterprise was successful when education partners allowed for a closer network between their areas of learning. Success came from practical and tangible projects that were often linked to local requirements. Authentic contexts provided engagement throughout the curriculum.

Overall this is a well-balanced book that provides a basis and focal point for up-to-date research informed practice. The chapters draw on many areas of Technology that will have impact upon our practice as well as forming the basis of discussion and improvement.

I recommend this book for design and technology practitioners who are interested in academic research and the structure it needs to take to ensure it is valid and reliable.

My only concern is the cost of the book, but I am sure most universities will keep a copy on the shelf for reference.