Critique in Design and Technology Education: About the Book

P John Williams and Kay Stables

The goal of this book is to set a historical, philosophical and pragmatic context for critique in design and technology education and provide a framework for critique and discussion about the integration of critique into the teaching and learning of design and technology in schools. The wonderfully diverse discussion and application of notions of critique attest to the diversity of the eminent design and technology education researchers who have contributed chapters to this book.

The term design and technology (D&T) education is used throughout the book to designate the curriculum area, although different terms such as technology, technologies, technology and enterprise and technology and engineering may be used in different countries. Authors may use other related terms when referring to specific examples.

In some quarters, there is resistance to the term *critique* as pretentious jargon, suggesting alternative terms such as review, reflect or analyse are adequate substitutions. However, the history of notions of critique, its philosophical roots and its implications go well beyond reviews, reflections or analyses. In fact in the chapter "Critiquing Teaching: Developing Critique Through Critical Reflection and Reflexive Practice", Susan McLaren suggests it is time to reconceptualise notions of reflection to develop something more meaningful.

Many of the authors of chapters in this book define critique in a way that suits the context of their discussion. This may seem initially confusing, and it may have made the book seem more unified if there was just one definition. However, the variety of definitions is indicative of the rich discourses that pervade the design and

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technology education profession and provide opportunity for debate and, indeed, critique. A critique in technology is a systematic analytical assessment of an element of technology – it may be a technology itself, a product, a process or a material. In a holistic sense, it is an element of a person's technological literacy, a fundamentally critical disposition that is brought to bear on all things technological. In the chapter "Critiquing Teaching: Developing Critique Through Critical Reflection and Reflexive Practice", Susan McLaren applies critique to the art of teaching and in that context describes it as effortful, uncomfortable and disruptive. In the chapter "The Identification and Location of Critical Thinking and Critiquing in Design and Technology Education", David Spendlove provides a fairly straightforward definition that considers critical thinking as *reflective thinking focused on deciding what to believe or do*. He goes on to address the semantics of the terminology in that the 'critical' can be considered as the process, whilst the 'critique' can be considered the outcome. Steve Keirl in the chapter "Critiquing as Design and Technology Curriculum Journey: History, Theory, Politics and Potential" proposes critique is both a noun and a verb, and for John Williams in the chapter "Critique as a Disposition", critique as a disposition is a verb.

The first group of five chapters in this book deals with a range of bases for critique: philosophical, historical, designerly, thinking and knowledge systems.

In the chapter "Philosophy as Critique", Marc de Vries presents the base of philosophy as a fundamental and enduring way of critiquing reality (including design, engineering, technology and everything related), and the strength of philosophical critique is that it is based on philosophy's primary method, namely, argumentation. He distinguishes two different ways in which philosophy does its critical work. The first critique refers to what so-called 'analytical philosophers' do: they analyse terminology. In the chapter "Alternative Knowledge Systems", Mishack Gumbo takes up this point and incorporates it into his critique of Western knowledge systems, a world view which restricts the consideration of alternative world views. The second type of critique for which philosophy can be a useful tool is related to debate itself. This is what people will intuitively associate with the term 'philosophy': dealing with the big questions.

In the chapter "Critique of Technology", Stephen Petrina provides a history of the critique of technology, which in this chapter begins with the spiritual critique of technology and proceeds historically through cultural criticism and social, psychic, ontic and identic critiques. Differentiated from the spiritual critique that preceded it, cultural criticism of technology emerged in the fifteenth and sixteenth centuries as a mode of describing and depicting the mechanical arts. In the eighteenth and nineteenth centuries, spiritual critique was displaced through a rejection of religion and theology as sources of modern authority. With the spiritual ground undermined, social, psychic, ontic and identic critics of media and technology compete for defensible ground for leverage of their particular critique. Stephen proposes that critique of technology is currently in historical decline and suggests the need for a renewal of spiritual critique to come full circle in this history of critique. He does, however, somewhat pessimistically conclude with Latour (2005) that critical

discourse has of late become impotent. It has no leverage point left; critics of technology have no reliable or stable ground for their critiques.

The position Kay Stables takes in the chapter "Critiquing Design: Perspectives and World Views on Design and Design and Technology Education, for the Common Good" is that the nature of design provides a fundamental basis for critique. As a way of broadening the perceptions of design and designing within the subject of design and technology, Kay provides a critique from historic, social, cultural and sustainable perspectives. This focus is derived from a concern that many learning experiences provided in design and technology education in schools are not consistently as challenging, engaging and meaningful as they could be and that it is often a limited understanding of design's importance and potential that underpins a restricted approach.

Kay outlines the shifting thinking and understanding of design, and a designer's role, that has significantly changed the territory and scope of design, particularly within the last 50 years. Changes have emerged through designers' questioning and challenging, shifting discourses by positioning design not so much as a thing to be critiqued but as a tool for critique in its own right. Critical and speculative designs are proposed as ways of operating outside the tight constraints of design that simply service industry and so reinforce global capitalist values. This form of design offers a wide range of opportunities for design to pose questions, provoke and inspire. It provides a useful and invigorating stance on critique as 'not necessarily negative; it can be a gentle refusal, a turning away from what exists, a longing, wishful thinking, a desire, and even a dream. Critical designs are testimonials to what could be, but at the same time, they offer alternatives that highlight weaknesses within existing normality' (Dunne and Raby 2013, pp. 34–35).

The goal in this discussion is to open up new possibilities for thinking about what design could be in the context of design and technology education in mainstream schooling. The forms of design that currently exist within this area of schooling vary from country to country and in many ways are driven by the history and culture of design, technology and education within local and national settings. However, there are some common threads highlighted in critiquing design that transcend national contexts, such as the need to place design and technology activities in socially and culturally relevant contexts, to recognise plurality in approaches to designing and to embed an ecological critique that respects a broader canvas of world views – ideas that are picked up later in the book by Mishack Gumbo in the chapter "Alternative Knowledge Systems" and Terry Wilkinson in the chapter "Politicizing the Discourse of Consumerism: Reflections on the Story of Stuff".

David Spendlove takes a more personal approach in the chapter "The Identification and Location of Critical Thinking and Critiquing in Design and Technology Education", developing an argument that engaging in a process of critical thinking leading to critique facilitates agency and self-understanding when engaged in design activities. He bases this on a conceptual framework of three main theories: critical theory, critical pedagogy and critical design, the intersection of which is the location of design and technology critical thinking. In the chapter "Critiquing as Design and

Technology Curriculum Journey: History, Theory, Politics and Potential", Steve Keirl also uses critical theory and its educational forms of critical literacy and critical pedagogy as a source of critiquing in design and technology.

David proposes that agency, within a critical design-thinking framework, is the intentional ability to exercise some control over one's thinking, environment and subsequent existence and action. This notion of intentional ability is aligned with John Williams' discussion (chapter "Critique as a Disposition"), which focuses on dispositions and how design and technology teachers can support the formation of specific dispositions. David's argument provides a counterpoint for the somewhat pessimistic conclusions of Stephen Petrina in the chapter "Critique of Technology", by exploring and developing an 'escape hatch' from the reproduction of orthodox practices and demonstrating how thinking can be opened through engaging in critical and metacognitive decision-making processes. In doing so, David provides further insight into the proposals made by Kay Stables in the chapter "Critique as a Disposition" for developing agency through more critical, speculative approaches.

Mishack Gumbo in the chapter "Alternative Knowledge Systems" critiques the knowledge system of design and technology, reminding readers that there are a range of different knowledge forms, each informed by culture and context. Mishack uses indigenous knowledge systems (IKS) as a counterpoint to Western knowledge systems (WKS) as a way to critique design and technology education. Taking as his starting point that the popular version of universal Western knowledge is currently but wrongly promoted as global knowledge, the technological knowledge that is being taught to students and how it is taught has generally not been critical of the domination of Western approaches. Rather, it has complied with dominant discourses because of their control function through which they determine what can be said and thought, and who can speak, when and with what authority.

Mishack posits that this is not just a problem of the knowledge used in education but that in a broader sense, some solutions to the problems facing Africa, for instance, lie in the need to understand the dynamics of indigenous knowledge. Steve Keirl in the chapter "Critiquing as Design and Technology Curriculum Journey: History, Theory, Politics and Potential" explores this issue as a binary approach to knowledge or literacy – 'cultural literacy', based on the Anglo-colonial literary canon for an elite, and 'functional literacy' for everyone else. Mishack's critique invites a culturally inclusive design and technology curriculum, which offers students equal opportunities and multiple perspectives to facilitate and broaden their understanding of technology, whilst at the same time ensuring dignity of all knowledge forms and accommodation of indigenous cultures.

The second group of five chapters applies notions of critique to certain overarching aspects of design and technology education.

In the chapter "Critiquing as Design and Technology Curriculum Journey: History, Theory, Politics and Potential", Steve Keirl elaborates critiquing as a way of thinking, acting and being in design and technology education. He defines critiquing as the purposeful, practical and metaphorical deconstruction and analysis of any product, process or system in order to expose the values and intentions behind designs, the unanticipated applications of technologies and the relationships

between people and technologies. As with designing, new meanings and knowledge emerge from critiquing, and new realisations emerge for seeing, judging and living in the designed world.

In this chapter, Steve situates his discussion of critique as a developmental journey towards a design and technology curriculum in which critiquing is fundamental to design and technological literacy. He reminds us of the substantial role that critical theory has played in bringing critique to education: 'Rather than celebrating objectivity and consensus, teachers must place the notions of critique and conflict at the centre of their pedagogical models . . . Critique must become a vital pedagogical tool' (Giroux 1983, p. 62). Steve usefully analyses the relationship between critiquing and designing and suggests that they both:

- develop socially valuable attributes in students
- develop thinking styles and confidence
- are valid components of D&T curriculum for all students
- are valid components of general democratic education for all students
- reject fact learning or rote learning
- are necessary for arriving at a best defensible compromise
- are undervalued in organisations

Critiquing is a tool that serves the design enterprise. In fact, effective designing demands deep critiquing.

In the chapter "Critique as a Disposition", John Williams proposes that educators should approach critique as a disposition to be developed. Dispositions are concerned with not only what a student can do but what a student is disposed to do, so addressing the often prevalent gap between abilities and actions. The essentiality of action in a disposition aligns with the manifold notions of activity within design and technology education – an education that is not passive – conceptually, it involves the construction of new knowledge, and practically, it involves movement and action and construction. Design and technology education therefore goes beyond the possibly conceptual although activity-based notions of technological literacy and ensures an activity-based end point. This aligns well with Steve's well-argued position in the chapter "Critiquing as Design and Technology Curriculum Journey: History, Theory, Politics and Potential" that critiquing is a fundamental component of design and technological literacy.

The careful structuring of classroom activities in sequences that are designed to elicit dispositions to critique is a fundamental design and technology teaching activity. In the chapter "Empathy as an Aspect of Critical Thought and Action in Design and Technology", Bill Nicholl extends John's discussion to explore the dispositional dimension to critical thinking in relation to empathy and also utilises the notion of critical thinking dispositions as a goal that can be achieved through 'inclusive design', a user-centred approach to designing.

The position Bill takes in the chapter "Empathy as an Aspect of Critical Thought and Action in Design and Technology" is that inclusive design is crucial for the development of critical thinking dispositions and for engendering empathy. To this end, designers have developed a range of 'signature pedagogies' that have been

introduced into schools and include user observation, focus groups, simulation and role playing. This introduction into schools is supported by Susan McLaren in the chapter "Critiquing Teaching: Developing Critique Through Critical Reflection and Reflexive Practice" where she alludes to the processes of teaching as designing and teacher as designer.

Bill suggests that direct and indirect empathy tools and, in particular, the use of role-play and perspective taking (Mead 1934) can be used iteratively and make up some of the signature pedagogies that help form habits of the mind as they 'provide the early socialisation into the practices and values of the field' (Shulman 2005, p. 59). In order to get closer to the lives and experiences of users, understanding their situation as well as their feelings requires an empathic approach to designing, which is part of an overall disposition to think critically.

Throughout the book, there is a call to reconceptualise reflection and develop more meaningful critique within the context of design and technology teaching, but this is perhaps most clearly articulated by Susan McLaren in the chapter "Critiquing Teaching: Developing Critique Through Critical Reflection and Reflexive Practice". Active engagement with critique of teaching practice facilitates professional learning and professional development. It is through critique that teachers can ensure they are professional, fluid and informed in their responses as, and when, scenarios and contexts demand and true to their personal ethics. In order to be in a position to engage in critique of teaching, a teacher needs to accept that their personal values can be challenged by others. This frame of mind demands that design and technology teachers develop the skills to critique *what* they are doing and *why* they are doing *what* they are doing.

The value of critical reflection lies in developing informed practice through professional learning, creative growth and critique, which has the potential to transform teaching.

This is an iterative and continuous process, more a frame of mind or ongoing habit (a disposition maybe, according to John in the chapter "Critique as a Disposition"), reappraised as their career progresses, as society and the needs of learners change and as understanding of design and technology, and design and technology education, develops.

Like Stephen Petrina in the chapter "Critique of Technology", Jacques Ginestié also uses a historical approach as the basis for chapter "A Critique of Technology Education for All in a Social and Cultural Environment", not to trace the history of technology education but to develop understandings about why the original ambitions for the area have not been achieved. To accomplish this, he uses an epistemological and sociocultural critique to develop a broad understanding of the world in which humans are living and developing – recognising that this is ultimately educational whenever societies organise schools for the transmission and development of knowledge. This includes the interrelations between school subjects and the efficiency of the teaching-learning process.

Jacques concludes that there is no simple answer to the current disaffection of pupils and lack of learning progress. A very old elitist tradition, reinforced by the strong logic of academic subjects, contradicts the democratic principles of free

education for every child, whatever his or her social origins, for ensuring equal opportunities. In France, the introduction of 'technology education for all' was proposed as an answer to the vocational system that helped France move from a rural to an industrial economy, but this approach has since been overtaken by social changes. Design and technology was proposed as a place where pupils no longer made things but the place where they understood why.

Two major lines of action emerge from this educational policy. The first axis concerns the curricula relating to design and technology and also how it relates to other subjects. The second is the need for continued professionalisation of design and technology teachers. In France, the integration of these two axes has resulted in a recasting of schools. This has involved changes in curricular structures, including emphasising the interdisciplinary, rethinking the academicism of the learned knowledge and paving the way for educational practices that promote a project-based approach and problem-solving. The generalised message from this chapter is that the individuation-socialisation dialectic is another way to think of the place of design and technology as an essential part of modern education for all.

The final set of chapters extends understandings of critique in design and technology education by considering pedagogic practices that allow such understandings to be used transformatively to build the critiquing capabilities of young people.

In the chapter "Disruptive Technologies", David Barlex takes the topic of disruptive technologies and explores how these can be used as a way to support learners to develop skills in critiquing technology. He focuses explicitly on practices and applications of critique and how these can be used within learning and teaching, moving critique beyond the academic, into a proactive position that deepens learners' understanding of technologies and their ability to challenge, rather than accept, technological developments. By drawing on a categorisation created by the McKinsey Global Institute (Manyika et al. 2013), he suggests a framework of criteria that define what a disruptive technology is and identifies a list of nine technologies he considers appropriate and relevant for learners to critique, such as additive manufacturing, artificial intelligence, big data, the Internet of Things and robotics. Maintaining his position in opening up learning and teaching practices, he introduces approaches that can be used to critically explore new technologies and the disruptive impacts they may have. Scenario building is presented as one such approach that can be used as a way of exploring his framework of criteria, and how this might be used in the context of robotics is explored in considerable detail.

Whilst the chapter provides concrete approaches to learners' developing skills in critiquing, David is also careful to raise cautions, for example, about a need to engage and support learners to help them develop 'a critical frame of mind' to critique complex areas. Within this, he stresses the importance of learners having sufficient knowledge and understanding of what they are critiquing. He also highlights how important it is that the curriculum itself is one that recognises the value of critique and includes it in assessment structures.

This chapter provides an additional basis for the notions John Williams develops in the chapter "Critique as a Disposition" related to dispositions, in that design and technology knowledge and understanding are the vehicles through which

critical dispositions are developed. It also illustrates ways of introducing critical speculation, for example, through scenario building, that has resonance with ideas put forward in the chapter "Critiquing Design: Perspectives and World Views on Design and Design and Technology Education, for the Common Good" by Kay Stables.

Cecilia Axell presents a chapter that also provides direct support for learning and teaching approaches that develop skills of critique. She does this in the chapter "Critiquing Literature: Children's Literature as a Learning Tool for Critical Awareness" by drawing on children's literature as a fertile space for learners to think critically about technologies. She illustrates the potential of this through a careful selection of children's fiction that provides opportunities to explore a range of values and attitudes through the 'technology landscapes' introduced within the narratives. Through the range of stories chosen, she illustrates how children's fiction can open up technological understandings in terms of artefacts themselves and also the historical, cultural and social contexts in which they are used. This allows her to show the richness of issues and values that can be explored, such as old versus new technology, the ways technologies have been used in colonisation, the conflicts that arise when new technologies threaten environmental sustainability and the enduring nature of some technologies.

Cecilia's aim is not to just present the potential of the stories but also to provide suggestions for using the literature to help learners develop their critical thinking skills, including by engaging in writing stories themselves. She highlights the value of fictional narrative as a way to 'problematise' technology in a distinctly different way than a textbook might that, in doing so, makes conflicting ideas, issues and value positions more understandable and accessible.

Through this chapter, Cecilia makes links with chapter "Critiquing Design: Perspectives and World Views on Design and Design and Technology Education, for the Common Good" by Kay Stables, using stories to illustrate how the user of an artefact defines its purpose and value. She also opens up perspectives from different world views, developing threads in both Kay Stables and Mishack Gumbo's chapters. The stories chosen, and the unpacking of the narratives within, also provide vivid illustrations of the notions of the subject-object relationship and sociocultural inscription discussed by Jacques Ginestié in the chapter "A Critique of Technology Education for All in a Social and Cultural Environment".

Niall Seery shifts the focus of critique to design processes in the chapter "Modelling as a Form of Critique", discussing the importance of seeing critique as a significant element of modelling in design and technology education. Here, he includes modelling as a practice to support critical inquiry and speculation – not just understanding 'the world "*as it is*" but also "*as it could be*"'. He identifies the starting point for this as the imaginative activities that small children engage in, seeing exploration and speculation that leads to insight, and the learning that results from it, as being at the core of such activities. Niall provides a rich account of different meanings and uses of the terms 'model' and 'modelling' and how these are manifested in both cognitive and physical, external contexts. Through this, he discusses ways in which each supports critical thinking, highlighting the capacity

for modelling to enable us to 'navigate the unknown'. Communication, with self and others, is pinpointed as a key value of modelling that focuses thoughts and ideas in ways that enable them to be critiqued as a basis for further generative modelling.

With small children, it is often a parent who acts as the mediator and mentor for encouraging critical reflection on a child's explorative or speculative 'modelling'. Niall provides examples of this, such as helping a child separate 'good' and 'bad' ideas after the child has explored whether an iPhone floats in the bath. In school design and technology, the teacher takes this role, and through the chapter, Niall places emphasis on issues and practices of learning and teaching through modelling. He draws attention to the special place this area of learning provides for understanding the value of modelling as a form of critique and of opportunities for direct application of the understandings that result. Identifying a danger of modelling that supports transmissional teaching – modelling to arrive at a 'correct' answer – he highlights the importance of learning in design and technology that exploits the 'wicked problem' nature of designing, the absence of one 'correct' answer and the need to learn to manage uncertainty. He recognises the complexity of a pedagogic approach based on this idea but provides a detailed and insightful discussion of aspects of this complexity, such as the challenges and opportunities of using heuristics and the place and role of knowledge. His discussion is populated with examples from research in design and technology, and consideration is given to implications for classroom practice. He does not deny the challenge of operating in the 'messiness' of modelling as a form of critique but makes clear its potential for effective learning.

In this chapter, Niall extends further the speculative dimension of critique introduced in the chapter "Critique as a Disposition" by Kay Stables and supports the critiquing-design relationship advanced by Steve Keirl in the chapter "Critiquing as Design and Technology Curriculum Journey: History, Theory, Politics and Potential". There is also resonance with Susan McLaren who, in the chapter "Critiquing Teaching: Developing Critique Through Critical Reflection and Reflexive Practice", promotes designerly approaches to self-critique in the professional practices of teachers, including its generative potential in opening up new possibilities for learning and teaching.

In the chapter "Hyper Design Thinking: Critique, Praxis and Reflection", Terry Wilkinson continues the thread of considering critique as a practice within classrooms. The question she explores relates to the nature of a critical pedagogy of consumption in design and technology education and ways in which this can positively politicise learning experiences. Terry's chapter takes the reader into a consideration of policy issues and pedagogic practices that deal with critique in the contexts of ethics, ecology, technology and consumerism. She begins by providing certain key insights into critical pedagogy and then builds this into a context of consumption. Illustrating ways in which promotion of the consumption of goods and services through advertising has become deeply rooted and embedded in societal learning, she raises the potential of education as a transformative space for changing perspectives. She explores this in more detail through critiquing education policy, taking an example from her own experience as a teacher in Ontario, Canada. In

critiquing Ontario's science and technology curriculum, she highlights a policy that has drawn inspiration from the science, technology, society and environment (STSE) education movement and has taken account of UNESCO's Decade of Education for Sustainable Development. Whilst commending its intentions, she illustrates ways in which a policy with good intentions can still become rooted in technocratic perspectives.

Terry counters this by raising the possibilities of design activism and presents an alternative view through providing a cameo of the approach taken through Annie Leonard's video *The Story of Stuff*. She illustrates ways in which the video provides an engaging and at times amusing critique of hyperconsumerism and design's role in creating product obsolescence. Drawing on her own teaching experience of using this resource with 12-year-olds, she exemplifies ways in which the video provoked a critical response in the learners as they considered issues of fairness both for the consumers who purchased such products and the workers who were being exploited in the process of manufacturing the products. Whilst presenting a critique of the resource and an analysis of implications of its use, she highlights the possibilities for learning and teaching practices that it affords. Like Niall Seery in the chapter "Modelling as a Form of Critique", Terry recognises the challenges of taking a more critical approach to learning and teaching in design and technology education and balances these against the educational value of a more critical, politicised stance.

This chapter provides valuable illustration of ideas developed in the chapter "The Identification and Location of Critical Thinking and Critiquing in Design and Technology Education" by David Spendlove in relation to the contribution of critical pedagogy to critical thinking in design and technology education, particularly in the territories of civil liberties, political and economic power and consumption, and of an ethical dimension explored in the chapter "Critiquing as Design and Technology Curriculum Journey: History, Theory, Politics and Potential" by Steve Keirl.

There are also some parallels with Susan McLaren who, whilst not focusing on learners in the chapter "Critiquing Teaching: Developing Critique Through Critical Reflection and Reflexive Practice", highlights the value of teachers using critique to make visible the assumptions embedded in a teaching context, such as underlying policy. There are clear links between the ecological concerns that are considered, with those expressed in the chapter "Critiquing Design: Perspectives and World Views on Design and Design and Technology Education, for the Common Good" by Kay Stables.

The final chapter in the book explores ways in which critique that is embedded in process in design and technology education can be a way of deepening design thinking and design development processes. As Niall Seery has done, in the chapter "Hyper Design Thinking: Critique, Praxis and Reflection", Belinda von Mengersen focuses on processes of designing that are relevant to all and any design and technology education practices. In her case, the focus is on the value of critique as part of integrated, continuous 'praxis' (the integration of theory and practice). Drawing from established practices in art and design education, she discusses the potential of a shift towards more critical behaviours and dispositions that could deepen design thinking and that can be developed through existing design

and technology pedagogies. A key aspect of this is a focus on metacognition, in which critique acts as the nexus between making (practice) and knowing (theory), supporting the articulation of reflection, either orally or through written language. She further underscores the importance of reflection within an iterative process of design and technology, again supporting the concept of praxis.

Drawing from theories of critical thinking and 'signature' pedagogies from art and design such as the design 'crit', the importance of language-based methods and dialogue is stressed, along with the need for vocabularies that allow learners to make meaning from reflection. Citing Sullivan (2010), Belinda identifies three valuable domains of practice – discursive, dialectical and deconstructive – that can support a rounded approach to critique. She also identifies parallels between the practice of writing and the practice of designing and the importance of learners seeing writing as valuable by linking it directly to what they are trying to achieve. A range of different processes are provided that suggest alternative forms of writing, for example, John Wood's (2004) tetrahedron approach that supports non-linear modes of writing and free flow 'stream of conscious' writing that can be used as a 'warm up' to get writing and ideas flowing. Finally, Belinda makes the points that timely formative feedback, development of a vocabulary of critique, and the use of creative processes of writing are all significant in supporting learners to develop a critical frame of mind and apply this in design development.

Belinda's chapter underscores the significant role of disposition presented by John Williams in the chapter "Critique as a Disposition" and Bill Nicholl in the chapter "Empathy as an Aspect of Critical Thought and Action in Design and Technology" and also echoes Susan McLaren's position in the chapter "Critiquing Teaching: Developing Critique Through Critical Reflection and Reflexive Practice" for a need to shift reflection to a more active, critical stance. There are also clear links to the history and significance of critique embedded in the South Australian Curriculum, chronicled by Steve Keirl in the chapter "Critiquing as Design and Technology Curriculum Journey: History, Theory, Politics and Potential".

As can be seen, the logic of the organisation of this book is explicit, beginning with philosophical, conceptual and historical contexts for critique, through the application of critique to design and technology education, and concluding with discussions of exemplars of critique as a way of deducing pedagogical practices which are conducive to critique. This logic indicates the usefulness of the book for a range of purposes: developing deeper understandings of the foundations of critique, integrating critique into current practice and developing new ideas about how to develop a critical disposition in students.

In searching for the place of critique in design and technology education, the approach taken in many of the chapters aligns with Bourdieu's (1991) notion of the 'heretic break', away from the:

- Vocational and academic spectrum
- Privileged knowledge that proliferates and that is manifested through reproduction of existing knowledge and practices
- Ubiquitous, unspoken and sometimes unconscious beliefs about the nature of knowledge and learning

and towards:

- The critiquing of epistemological beliefs and the engagement in wider socially responsible contexts
- Meaningful substantive critical reflection about the significant contribution of design and technology to a broader education provision
- The development of student capability to articulate a critical frame to their relationship with technology

This book is the first to be dedicated to critique as a practice within the field of design and technology education and offers educators and tertiary students a source of ideas and techniques for critiquing design and technological processes, products and pedagogies. As expressed by Steve Keirl in the chapter "Critiquing as Design and Technology Curriculum Journey: History, Theory, Politics and Potential", it is the hope of all the authors that this book will contribute to the recognition of critique as being a valid, vibrant component of the best design and technology education practice addressing inequity, injustice, sustainability and other ethical issues that arise in any of our realms of co-existence.

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